



150 Gasoline Alley
Indianapolis, Indiana 46222
317-484-8240

BMW M12/7 Customer Specification Report

Engine Type	BMW M12/7	Date of First Build	08_May_2011
VDS Identification	M12/7 JL V210	Date of Last Build	06_February_2017
Build Number	2	Owner	
Mileage Last Build		Chassis	
Block			
Bore	89.472 mm (3.5225 in)	Stroke	80.00 mm (3.1496 in)
Displacement	2112.93 cm ³	Compression Ratio	12.73:1
Block	M10 Road Car	Crankshaft	VDS M12/7 Lightweight
Cylinder Liners	Iron Integral w/Block	Pilot Bearing ID	17.00 mm
Connecting Rods	Carillo -VDS Lightweight	Clutch	7-1/4
Pistons	JE - VDS	Flywheel	124 Tooth Ring Gear
Cylinder Head			
Cylinder Head Type	New BMW Motorsport	Casting Number	13097389/RR350
Inlet Camshaft	99-VDS-02 (278/485)	Exhaust Camshaft	99-VDS-01 (272/450)
Valve Lash Intake	0.010 – 0.012 inches	Valve Lash Exhaust	0.011 - 0.013 inches
Inlet Valves	Del West – VDS Titanium	Exhaust Valves	Del West – VDS Titanium
Pumps			
Oil Pump Type	Dry Sump BMW M12/14	Auxiliary Oil Pressure Relief	Not Applicable
Fuel Pump	Bosch 044 Electric		
Fuel System			
Fuel Injection Pump	Kugelfischer / Bosch	Fuel Injection Pump ID	PL04 133.02 A1 930
Idle Stroke	0.020	WOT Shuttle Stroke	0.075
Fuel Trim Screw Dim	7.35 millimeters	Fuel Pressure Relief Valve	Kinsler K140 @ 45 PSI
Fuel Pressure	Min: 40 PSI - Max: 60 PSI		
Ignition System			
Ignition Box Type	Omex 600	Ignition Box Serial Number	
Ignition Timing	31.0° BTDC @ 6000	Spark Plugs	NGK CR10EIX
Firing Order	1-3-4-2		
Running Parameters			
Engine RPM Min	>2000	Engine Maximum RPM	9250
Oil Temp Max	120° C – 248°F	Water Temp Max	100° C – 212°F
Oil Pressure Min	75 PSI Hot	Oil Pressure Max	115 PSI
Fuel Requirements	108 Motor Octane Leaded	Oil Recommendation	Mobil 1 15W-40
Rev Limiter Setting	9400	Fuel Recommendation	VP C-12 Leaded
Torque Specifications			
Spark Plugs 10.0 mm Thread with Copper washers	96 in-lbs	Lube with Grahagen	
Cam Cover Nuts M5 X .8	40 in-lbs	Lube with Motor Oil	
Flywheel Bolts ARP - VDS	90 lb-ft	Loctite 242 On Threads	
Clutch Stud Nuts M8 X 1.25	15 lb-ft	Lube with Motor Oil	

Dynamometer Test Results

VDS Racing Engines
150 Gasoline Alley
Indianapolis IN 46222
(317) 484-8240
www.vdsracingengines.com



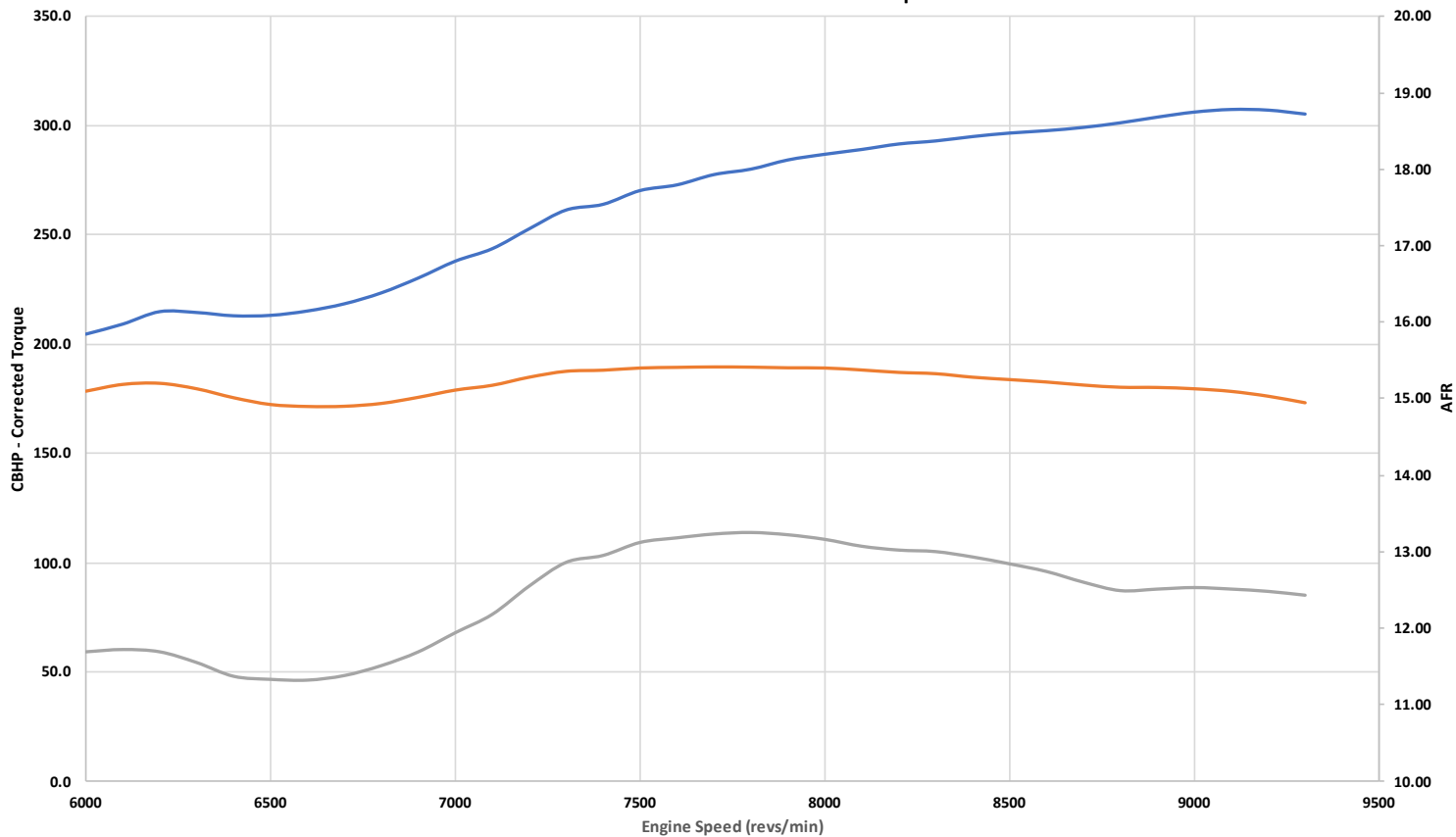
Test ID: M12-7 V210-2-5 on 2017-02-01 @ 12-22-49
Date: 2/1/2017
Correction Method: Standard

RPM	RAD	C-Torque (ft-lb)	CBHp	CCP (in Hg)	Δ CPP (in Hg)	AFR	Fuel Pressure (PSI)	Oil Pressure (PSI)	ECT Out	EGT #1	EGT #2	EGT #3	EGT #4	VDC	RPM
6000	97.7	178.4	204.5	27.30	-2.00	11.69	45.5	110.4	179.0	1271	1339	1312	1380	12.8	6000
6100	97.7	181.5	209.1	27.30	-1.90	11.72	45.5	110.6	179.0	1269	1332	1304	1380	12.8	6100
6200	97.7	182.0	214.8	27.30	-2.00	11.69	45.4	111.5	179.0	1276	1326	1301	1389	12.8	6200
6300	97.7	179.5	214.4	27.30	-2.00	11.55	45.3	112.1	179.0	1277	1323	1303	1386	12.8	6300
6400	97.7	175.4	212.9	27.30	-2.00	11.37	45.2	113.0	179.0	1279	1320	1302	1382	12.8	6400
6500	97.7	172.3	213.1	27.30	-2.00	11.33	45.2	113.9	179.0	1279	1319	1300	1384	12.8	6500
6600	97.7	171.4	215.1	27.30	-2.00	11.32	45.1	114.7	179.0	1277	1317	1301	1385	12.8	6600
6700	97.7	171.5	218.4	27.30	-2.00	11.38	45.1	115.5	179.0	1275	1314	1302	1387	12.8	6700
6800	97.7	172.8	223.4	27.30	-1.90	11.51	45.0	116.1	179.2	1277	1314	1302	1392	12.8	6800
6900	97.7	175.6	230.2	27.40	-1.90	11.69	44.9	116.7	179.8	1285	1318	1304	1400	12.8	6900
7000	97.7	178.9	237.9	27.40	-1.90	11.94	44.9	117.5	180.0	1294	1325	1312	1408	12.8	7000
7100	97.7	181.1	243.6	27.40	-1.80	12.18	44.8	118.0	180.0	1302	1332	1321	1415	12.8	7100
7200	97.7	184.8	252.7	27.40	-1.80	12.55	44.7	118.4	180.0	1315	1347	1342	1428	12.8	7200
7300	97.7	187.5	261.3	27.40	-1.90	12.86	44.8	118.9	180.0	1325	1361	1357	1438	12.8	7300
7400	97.7	188.0	263.9	27.40	-1.90	12.95	44.8	118.7	180.0	1327	1363	1360	1441	12.8	7400
7500	97.7	189.0	270.2	27.40	-1.90	13.12	44.9	115.7	180.0	1332	1365	1362	1449	12.8	7500
7600	97.7	189.3	272.8	27.40	-1.90	13.18	44.9	114.7	180.0	1333	1365	1361	1452	12.8	7600
7700	97.7	189.5	277.5	27.40	-1.90	13.23	44.8	114.6	180.0	1337	1366	1358	1457	12.8	7700
7800	97.7	189.4	280.0	27.40	-1.90	13.25	44.8	114.7	180.0	1339	1366	1356	1462	12.8	7800
7900	97.7	189.1	284.2	27.30	-1.90	13.22	44.7	114.9	180.0	1343	1366	1357	1473	12.8	7900
8000	97.7	189.0	286.8	27.30	-1.90	13.16	44.7	115.2	180.0	1344	1365	1359	1481	12.8	8000
8100	97.7	188.1	289.0	27.30	-2.00	13.07	44.6	115.6	180.0	1345	1364	1364	1487	12.8	8100
8200	97.7	187.0	291.5	27.30	-2.00	13.02	44.5	115.9	180.4	1351	1368	1373	1495	12.8	8200
8300	97.7	186.4	292.9	27.30	-2.00	13.00	44.5	115.9	180.8	1357	1372	1377	1501	12.8	8300
8400	97.7	184.8	294.9	27.30	-2.00	12.93	44.4	116.1	181.0	1369	1377	1383	1509	12.8	8400
8500	97.7	183.7	296.5	27.30	-2.00	12.84	44.4	116.5	181.0	1374	1383	1391	1517	12.8	8500
8600	97.7	182.6	297.6	27.30	-2.00	12.74	44.4	116.9	181.0	1374	1390	1399	1525	12.8	8600
8700	97.7	181.2	299.1	27.30	-2.00	12.60	44.4	118.0	181.0	1373	1399	1409	1527	12.8	8700
8800	97.7	180.2	301.2	27.30	-2.00	12.49	44.4	119.2	181.1	1376	1406	1418	1528	12.8	8800
8900	97.7	180.1	303.8	27.30	-2.00	12.51	44.5	120.1	181.6	1385	1418	1429	1540	12.8	8900
9000	97.7	179.5	306.1	27.30	-2.00	12.53	44.6	121.1	182.0	1400	1431	1436	1556	12.8	9000
9100	97.7	178.3	307.3	27.20	-2.00	12.51	44.6	121.9	182.0	1415	1440	1438	1568	12.8	9100
9200	97.7	176.1	307.0	27.30	-2.00	12.48	44.5	122.5	182.0	1428	1447	1436	1575	12.8	9200
9300	97.7	173.1	305.2	27.30	-2.00	12.43	44.4	123.1	182.5	1436	1451	1435	1569	12.8	9300

Notes

White Green white timing marks for cylinders 1 & 4	FIP Fuel Trim Screw Dimension 11.0 millimeters.
Yellow white Yellow timing marks for cylinders 2 & 3	Spark plugs NGK CR10BX
VDS Distributor Ignition System	Fuel injector cracking pressures 33 to 35 Bar
Cal File: M12-7 210-2 OMEX 600.VO.70.cal Ignition Timing 31.0° BTDC @6000	EGT Cylinder 4 failed during test. Cyl 4 EGT's range between 1300°F - 1450°F
Ignition control Box SN 39740	

BMW M12-7 V210-2-5 Power Test Graph



Invoice

150 Gasoline Alley | Indianapolis IN 46222
Phone (317) 484-8240 Fax (317) 484-8241

Date 2/7/2017

Invoice # 3591

Bill To:

Ship To:

S.O. No.	P.O. Number	Ship Date	Via	Terms	Project			
		2/8/2017		Due on rec...	BMW M12/7 JLF V210-2			
Description					Qty	U/M	Price Each	Amount
Bearing - 1st Intermediate Gear Shaft Front					1	ea	24.33	24.33
Bearing - 1st Intermediate Gear Shaft Rear					1	ea	15.73	15.73
Bearing - 2nd Intermediate Gear					1	ea	10.93	10.93
Bearing - Crankshaft Pilot					2	ea	58.43	116.86
Plug - M15 x 1.5 Front Cover Oil Galley					1	ea	31.40	31.40
Connecting Rods BMW					4	ea	345.80	1,383.20
Bearing - Connecting Rod (STD)					4	pr	15.99	63.96
Crankshaft - BMW M12/7 - VDS Specification (Includes Freight & Customs Fees)					1	ea	5,832.89	5,832.89
Crankshaft Seal Front					1	ea	6.63	6.63
Seal - Crankshaft, Rear					1	ea	63.33	63.33
Crankshaft Woodruff Key					1		0.76	0.76
Dowel - Intermediate - Plate to Block					2	ea	12.00	24.00
Dowel - Cam Carrier to Cylinder Head					1	ea	2.16	2.16
Flywheel M12/7 - STD Weight VDS Trigger Tooth Wheel					1	ea	576.80	576.80
BMW M12 / 7 Flywheel Clutch Stud w/o trigger lug					6	ea	18.00	108.00
Dowel - Flywheel					1	ea	18.00	18.00
Bolt - Flywheel					8	ea	14.24	113.92
Bearing - Main Shell, Standard Blue					8	ea	49.85	398.80
Bearing - Main Thrust, Standard Blue					2	ea	65.18	130.36
Piston Ring - Second Compression - Low Friction					4	ea	75.00	300.00
Piston Ring Set					1	ea	86.93	86.93
Pistons					4	ea	220.63	882.52
Seal - Alternator Gear Shaft					1	ea	16.00	16.00
Wrist Pin Locks					4	Pair	2.50	10.00
Wrist Pins					4		22.33	89.32
Adaptor - M26 X 1.5 to -12 JIC Male, Sump					1	ea	23.90	23.90
Plug - Block Front					1	ea	81.00	81.00
Sealing Ring - 40 X 49, Copper					1	ea	6.00	6.00
Cylinder Block Parts Subtotal:								10,417.73
					Total			
					Payments/Credits			
					Balance Due			

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		2/8/2017		Due on rec...	BMW M12/7 JLF V210-2			
Description					Qty	U/M	Price Each	Amount
Bearing - 3rd Intermediate Gear					1	ea	16.04	16.04
Tappet - DLC, M12					16	ea	84.50	1,352.00
Camshaft - Exhaust, M12/7					1	ea	1,330.00	1,330.00
Camshaft - Inlet, M12/7					1	ea	1,330.00	1,330.00
Nut Jet M5 X 0.8 Moly Coat - Cam Cover					20		1.92	38.40
Gasket - Cam Cover					2	ea	18.84	37.68
Gasket - Cylinder Head					1	ea	160.69	160.69
O-Ring 3rd Intermediate Bushing					1	ea	1.45	1.45
Gear Shaft Dowel Pin 3rd Intermediate					1	ea	0.50	0.50
Pin - Ignition Rotor Adaptor					1	ea	0.28	0.28
Seal - Ignition Rotor Shaft					1	ea	12.37	12.37
Plug - Water Passage (Various Sizes)					12	ea	0.99	11.88
Tappet Shim OHC					16	ea	12.00	192.00
Valve - Exhaust - BMW M12/7, CRN Coated Seat Face & Tip					8	ea	167.40	1,339.20
Valve - Inlet - BMW M12/7, CRN Coated Seat Face & Tip					8	ea	166.05	1,328.40
Platform - Valve Spring (Used)					10	ea	10.00	100.00
Platform - Valve Spring (Used)					3	ea	10.00	30.00
Shim - Valve Spring, 0.010"					8	ea	3.05	24.40
Shim - Valve Spring, 0.015"					8	ea	3.05	24.40
Valve Spring - OHC					16	ea	49.32	789.12
Seal - Valve Stem - 7.0 mm					16	ea	5.00	80.00
Flange - Fuel Injection Pump Drive					1	ea	359.69	359.69
Fitting - Oil Drain Back					1	ea	15.21	15.21
Fitting - Water Pump Bleed, M10 X 1.0 Barb Fitting					1	ea	79.50	79.50
Nut Jet M8 x 1.25 Moly Coat - Manifold					4	ea	3.30	13.20
Stud - ARP M6 X 1.482 SS - Exhaust Manifold					16	ea	7.48	119.68
Cylinder Head Parts Subtotal:								8,786.09
Hose Clamp - 5.0 mm Hose					2	ea	3.62	7.24
					Total			
					Payments/Credits			
					Balance Due			

Invoice

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Date 2/7/2017

Invoice # 3591

Bill To:

Ship To:

S.O. No.	P.O. Number	Ship Date	Via	Terms	Project			
		2/8/2017		Due on rec...	BMW M12/7 JLF V210-2			
Description					Qty	U/M	Price Each	Amount
Hose Clamp - Coolant Transfer Hose					2	ea	3.25	6.50
Hose Clamp - Scavenge Hose					4		2.00	8.00
Hose - Front Cover to Cylinder Head 5mm Braided					1	ea	10.55	10.55
Hose Oil Scavenge Tube to Scavenge Pump Manifold					0.5	ft	12.64	6.32
Hose Silicon Coolant Transfer Tube Connection (Blue)					0.5	ft	18.18	9.09
Hose End - Fuel Line					8	ea	22.50	180.00
Kit - BMW M12/7 Installation					1	ea	69.68	69.68
Oil Filter					1	ea	15.66	15.66
Oil Pressure Pump PRV Sealing Washer					1	ea	0.54	0.54
Spring - Oil Pressure Pump PRV					1	ea	4.78	4.78
Kit - BMW M12/7 O-Rings					1	ea	79.72	79.72
Belt - Water Pump					1	ea	19.78	19.78
Ignition System - M12/7 with programmable limiter							3,800.00	3,800.00
Injector Trumpet					4	ea	490.00	1,960.00
Spark Plug - NGK CR10EIX					4	ea	11.25	45.00
Pumps, Ignition, and Ancillaries Parts Subtotal:								6,222.86
REBUILD OPERATIONS					150	hr	105.00	15,750.00
Disassemble Engine								
Clean Components								
Crack Test - Fluorescent Dye Inspections (non-Ferrous Parts)								
Crack Test - Magnetic Particle "Wet Bath" Inspection (Ferrous Parts)								
Pressure Test Block								
Pressure Test Cylinder Head								
Perform Dimensional Inspections								
Perform Visual Inspections								
Perform Basic Machining & Rebuild Labor Operations								
Reassemble Engine								
Balance Crankshaft - Check Unbalance & Correct as Necessary					1	ea	187.50	187.50
					Total			
					Payments/Credits			
					Balance Due			

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Date 2/7/2017

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Bill To:

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S.O. No.	P.O. Number	Ship Date	Via	Terms	Project			
		2/8/2017		Due on rec...	BMW M12/7 JLF V210-2			
Description					Qty	U/M	Price Each	Amount
Balance Flywheel & Clutch - Check Unbalance & Correct as Necessary					1	ea	156.25	156.25
Remove Broken Pin - EDM Specialties					1	ea	50.00	50.00
Soda Blast Head					1	ea	30.00	30.00
Coating - Rod Bearings					4	ea	15.00	60.00
Fuel Injector Testing					1	ea	45.00	45.00
Cylinder Block - Prep New Block, Mock-Up Gear Train & Fit To New Block					8	hr	105.00	840.00
Cylinder Head - Prep New Head, Mock-Up Cam Carrier & Fit Gear Train					8	hr	105.00	840.00
Fabricate & Pressure Test Fuel Injection Nozzle Hose					4	ea	18.75	75.00
Mock-Up & New Cylinder Head & Cam Carriers					4	hr	105.00	420.00
Labor, Machining & Outside Services Subtotal								18,453.75
Dynamometer Test					1		1,800.00	1,800.00
Pennzoil GT Oil 25W50, Quart					8	ea	6.42	51.36
VP Blue Racing Gasoline					7	gal	13.62	95.34
Consumable Supplies - Dyno Test					1	ea	25.00	25.00
Post-Dyno Inspection, Crate & Ship					4	hr	105.00	420.00
Dynamometer Test Subtotal:								2,391.70
Shop Consumables: Solvents, Sealants, Abrasives, Waste Disposal, Unitemized Fasteners					1	ea	200.00	200.00
					Total			
					Payments/Credits			
					Balance Due			

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Date 2/7/2017

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Bill To:

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S.O. No.	P.O. Number	Ship Date	Via	Terms	Project			
		2/8/2017		Due on rec...	BMW M12/7 JLF V210-2			
Description					Qty	U/M	Price Each	Amount
Freight Parts Inbound/Outbound					1		237.68	237.68
Shop Supplies, Environmental & Freight Subtotal								437.68
Tom Lee - Credit for Crankshaft M12/7 Sold to Veloce Motors West					1	ea	-2,000.00	-2,000.00
Deposits Applied							-21,000.00	-21,000.00
Disclaimer: All of VDS Racing Engine Inc.'s parts are intended for "RACING" applications only. Due to the intended use, all of VDS Racing Inc.'s products are sold "as-is" without any express or implied warranty of any kind, including fitness. The buyer assumes all risk as to quality, performance and use of these products and agrees to hold VDS Racing Engines Inc., their agents and employees harmless for any damage, loss, or injury; including any and all incidental or consequential damages arising from the installation, or use of VDS Racing Engines Inc.'s products. VDS Racing Engines Inc. also reserves the right to modify or discontinue parts without notice.						Total		\$23,709.81
						Payments/Credits		\$0.00
						Balance Due		\$23,709.81

46,709.⁰⁰



150 Gasoline Alley | Indianapolis IN 46222
Phone (317) 484-8240 Fax (317) 484-8241

Estimate

Date 3/25/2016

Estimate # 284

Bill To:

Engine Project: BMW M12/7 JLF V21...

Item	Description	Qty	U/M	Cost	Total
Cylinder Block ...	***CYLINDER BLOCK COMPONENTS***				0.00T
98867A325*	Stud - Alternator Cover	3	ea	1.68	5.04
6003 LL*	Bearing - 1st Intermediate Gear Shaft Front	1	ea	24.33	24.33
HK2016*	Bearing - 1st Intermediate Gear Shaft Rear	1	ea	15.73	15.73
K16X20X17*	Bearing - 2nd Intermediate Gear	1	ea	10.93	10.93
6903 LL*	Bearing - Crankshaft Pilot	2	ea	58.43	116.86
VDS-M12-140*	Plug - M15 x 1.5 Front Cover Oil Galley	1	ea	31.40	31.40
DIN7603 A15X...	Bearing Plate Intermediate Port Plug Sealing Washer	1		0.76	0.76
BM-VDS2>-65...	Connecting Rods BMW	4	ea	345.80	1,383.20
CB1663HX	Bearing - Connecting Rod	4	ea	14.13	56.52
CE020	Crankshaft - BMW M12/7 - VDS Specification	1	ea	5,075.00	5,075.00
VDS-M12-145*	Adaptor - Crankshaft Pilot Bearing	1	ea	81.00	81.00
S28X40X7V B...	Crankshaft Seal Front	1	ea	6.63	6.63
11-14-2-249-533*	Seal - Crankshaft, Rear	1	ea	63.33	63.33
98490A230*	Crankshaft Woodruff Key	1		0.76	0.76
Miscellaneous P...	Cylinder Block - - - SUPPLIED BY CUSTOMER	1	ea	0.00	0.00
11-11-1-743-118*	Dowel - Block to Cylinder Head	2	ea	2.32	4.64
VDS-11-11-2-2...	Dowel - Intermediate - Plate to Block	2	ea	12.00	24.00
11 22 1 280 289...	Flywheel - M12/7 - VDS Custom Part	1	ea	848.50	848.50
VDS-M12-135*	Dowel - Flywheel	1	ea	18.00	18.00
P10AU.945-1*	Bolt - Flywheel	8	ea	14.24	113.92
11-22-1-280-076	BMW M12 / 7 Flywheel Clutch Stud w/o trigger lug	6	ea	84.06	504.36
98541A134	Retaining Ring Crankshaft Gear	1	ea	1.44	1.44
07-11-9-934-671*	Retaining Ring 2nd Intermediate Bearing	1	ea	5.75	5.75
11-31-1-251-793	Shim 2nd Intermediate Gear	2	ea	41.81	83.62
11-31-1-280-241*	Spacer - Gear 1st Intermediate Front	1	ea	18.50	18.50
11-21-1-304-039*	Bearing - Main Shell, Standard Blue	8	ea	49.85	398.80
11-21-1-304-033*	Bearing - Main Thrust, Standard Blue	2	ea	65.18	130.36
VDS-M12-125*	Oil Restrictor Jet	1	ea	15.69	15.69
101932	Piston Ring - Second Compression - Low Friction	4	ea	75.00	300.00
JG1004-3524	Piston Ring Set	1	ea	86.93	86.93
Miscellaneous P...	Pistons	4	ea	220.63	882.52
S26X37X7SL*	Seal - Alternator Gear Shaft	1	ea	16.00	16.00
DIN7603 A38X...	Sealing Washer Coolant Core Plug Adaptor, Copper	1	ea	4.80	4.80
07-11-9-963-466*	Sump Scavenge Outlet Adaptor Sealing Ring	1	ea	0.46	0.46
866-063-MW	Wrist Pin Locks	4	ea	2.50	10.00
866-2500-17-93C	Wrist Pins	4		22.33	89.32
				Total	



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Estimate

Date 3/25/2016

Estimate # 284

Bill To:

Engine Project: BMW M12/7 JLF V21...

Item	Description	Qty	U/M	Cost	Total
	Cylinder Block Parts Subtotal:				10,429.10
Cylinder Head ...	***CYLINDER HEAD COMPONENTS***				0.00T
K20X26X20	Bearing - 3rd Intermediate Gear	1	ea	16.04	16.04
CF212 D/L/C*	Tappet - DLC, M12	16	ea	84.50	1,352.00
99-VDS-01	Camshaft - Exhaust, M12/7	1	ea	1,330.00	1,330.00
99-VDS-02	Camshaft - Inlet, M12/7	1	ea	1,330.00	1,330.00
11-31-1-252-220*	Plug - Camshaft Rear	2	ea	25.92	51.84
11-12-1-306-294	Cylinder Head - M12/7 (FROM TOM LEE'S INVENTORY)	1		0.00	0.00
VDS-M12-201*	Fitting - Water Pump Bleed, M10 X 1.0 Barb Fitting	1	ea	79.50	79.50
VCO73SP1060...	Gasket - Cam Cover	2	ea	18.84	37.68
H1866SP1027S	Gasket - Cylinder Head	1	ea	160.69	160.69
9263K251*	O-Ring 3rd Intermediate Bushing	1	ea	1.45	1.45
91595A023	Gear Shaft Dowel Pin 3rd Intermediate	1	ea	0.50	0.50
07-11-9-942-160*	Pin - Ignition Rotor Adaptor	1	ea	0.28	0.28
S17X32X7V	Seal - Ignition Rotor Shaft	1	ea	12.37	12.37
511-580-0000-7*	Tappet Shim OHC	16	ea	12.00	192.00
VDS-EV-BMW...	Valve - Exhaust - BMW M12/7, CRN Coated Seat Face & Tip	8	ea	167.40	1,339.20
VDS-IV-BMW-...	Valve - Inlet - BMW M12/7, CRN Coated Seat Face & Tip	8	ea	166.05	1,328.40
BA0386*	Shim - Valve Spring, 0.010"	8	ea	3.05	24.40
BA0387*	Shim - Valve Spring, 0.015"	8	ea	3.05	24.40
CT1530ML-TC*	Valve Spring - OHC	16	ea	49.32	789.12
FP705A	Seal - Valve Stem	16	ea	2.64	42.24
	Cylinder Head Parts Subtotal:				8,112.11
Ancillaries	***PUMPS IGNITION ANCILLARIES***				0.00T
93695A130*	Fuel Injection Pump Actuator Rod End Jam Nut M5 Left Hand	1		0.24	0.24
92497A300*	Fuel Injection Pump Actuator Rod End Jam Nut M5 R/H	1	ea	0.24	0.24
MB-M5*	M5 LH Rod End	1		13.73	13.73
MM-M5*	M5 RH Rod End	1		13.41	13.41
M12-218-VDS	Hose Assembly - M12 Cylinder Head to Sump Oil Drain	1	ea	150.00	150.00
0540 99	Hose Clamp - 5.0 mm Hose	2	ea	3.62	7.24
Norma 25-40	Hose Clamp - Coolant Transfer Hose	4	ea	3.25	13.00
				Total	



150 Gasoline Alley | Indianapolis IN 46222
Phone (317) 484-8240 Fax (317) 484-8241

Estimate

Date 3/25/2016

Estimate # 284

Bill To:

Engine Project: BMW M12/7 JLF V21...

Item	Description	Qty	U/M	Cost	Total
Norma 16-25	Hose Clamp - Scavenge Hose	4		2.00	8.00
1859-0410	Hose - Front Cover to Cylinder Head 5mm Braided	1	ea	10.55	10.55
340012*	Hose Oil Scavenge Tube to Scavenge Pump Manifold	0.5	ft	12.64	6.32
5515-125*	Hose Silicon Coolant Transfer Tube Connection (Blue)	0.5	ft	18.18	9.09
Kit-BMW-K2	Kit - BMW M12/7 Installation	1	ea	69.68	69.68
LF404	Oil Filter	1	ea	15.66	15.66
07-11-9-963-253*	Oil Pressure Pump PRV Sealing Washer	1	ea	0.54	0.54
11-41-1-744-324*	Spring - Oil Pressure Pump PRV	1	ea	4.78	4.78
KIT-BMW-K9	Kit - BMW M12/7 O-Rings	1	ea	79.72	79.72
T5-455*	Belt - Water Pump	1	ea	19.78	19.78
Kit-M12/7-K02	Ignition System - M12/7 with programmable limiter			3,800.00	3,800.00
	Pumps, Ignition, and Ancillaries Parts Subtotal:				4,221.98
Labor-Rebuild ...	***REBUILD OPERATIONS***	150	hr	105.00	15,750.00
	Disassemble Engine				
	Clean Components				
	Crack Test - Fluorescent Dye Inspections (non-Ferrous Parts)				
	Crack Test - Magnetic Particle "Wet Bath" Inspection (Ferrous Parts)				
	Pressure Test Block				
	Pressure Test Cylinder Head				
	Perform Dimensional Inspections				
	Perform Visual Inspections				
	Perform Basic Machining & Rebuild Labor Operations				
	Reassemble Engine				
Outside Service	Balance Crankshaft - Check Unbalance & Correct as Necessary	1	ea	187.50	187.50
Outside Service	Balance Flywheel & Clutch - Check Unbalance & Correct as Necessary	1	ea	156.25	156.25
Outside Service	Coating - Rod Bearings	4	ea	15.00	60.00
				Total	



150 Gasoline Alley | Indianapolis IN 46222
Phone (317) 484-8240 Fax (317) 484-8241

Estimate

Date 3/25/2016

Estimate # 284

Bill To:

Engine Project: BMW M12/7 JLF V21...

Item	Description	Qty	U/M	Cost	Total
Labor	Cylinder Block - Prep New Block, Mock-Up Gear Train & Fit To New Block	8	hr	105.00	840.00
Labor	Cylinder Head - Prep New Head, Mock-Up Cam Carrier & Fit Gear Train	8	hr	105.00	840.00
Outside Service	Dry Film Coat Engine Components (3rd Intermediate Gear Pin Bushing)	1	ea	35.00	35.00
Outside Service	Fabricate & Pressure Test Fuel Injection Nozzle Hose	4	ea	18.75	75.00
Outside Service	Machine Flywheel for VDS Crank Trigger Mounting Screws	1	ea	90.00	90.00
Labor	Mock-Up & New Cylinder Head & Cam Carriers	4	hr	105.00	420.00
	Labor, Machining & Outside Services Subtotal				18,453.75
Dyno Test	***DYNAMOMETER TESTING***				0.00T
Dynamometer T...	Dynamometer Test	1		1,800.00	1,800.00
3623	Pennzoil GT Oil 25W50, Quart	8	ea	6.42	51.36
VP Blue	VP Blue Racing Gasoline	7	gal	13.62	95.34
SHOP SUPPLI...	Consumable Supplies - Dyno Test	1	ea	25.00	25.00
Post Dyno Inspe...	Post-Dyno Inspection, Crate & Ship	4	hr	105.00	420.00
	Dynamometer Test Subtotal:				2,391.70
Shop Supplies 4...	Shop Consumables: Solvents, Sealants, Abrasives, Waste Disposal, Unitemized Fasteners	1	ea	200.00	200.00
Freight Outbound	Freight Parts Inbound/Outbound - - TBD	1			0.00
Freight Outbound	Freight Engine Outbound - - TBD	1		0.00	0.00
	Shop Supplies, Environmental & Freight Subtotal				200.00
Miscellaneous P...	Tom Lee - Credit for Crankshaft M12/7 Sold to Veloce Motors West	1	ca	-2,000.00	-2,000.00
				Total	\$41,808.64

Disclaimer: All of VDS Racing Engine Inc.'s parts are intended for "RACING" applications only. Due to the intended use, all of VDS Racing Inc.'s products are sold "as-is" without any express or implied warranty of any kind, including fitness. The buyer assumes all risk as to quality, performance and use of these products and agrees to hold VDS Racing Engines Inc., their agents and employees harmless for any damage, loss, or injury; including any and all incidental or consequential damages arising from the installation, or use of VDS Racing Engines Inc.'s products. VDS Racing Engines Inc. also reserves the right to modify or discontinue parts without notice.

Sales Order

150 Gasoline Alley
Indianapolis, IN 46222

Date	S.O. No.
4/28/2014	787

Name / Address

Ship To	

P.O. No.	Project		
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Description	Ordered	Rate	Amount
New BMW M12/7 Cylinder Head	1	10,687.50	10,687.50T
Freight Parts Inbound	1	745.79	745.79
Out of State		0.00%	0.00

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Total

\$11,433.29