

Vehicle Technical Specifications



Vehicle: BMW E90 325i (06-) Class: GTS

Vehicle Manufacturer: BMW

Year and Model: (2006 -) E90 325i

This specifications form was developed by SCCA Pro Racing and will be used by the TECHNICAL MANAGER to establish technical compliance for vehicles competing in the SCCA PRO RACING WORLD CHALLENGE series. The TECHNICAL MANAGER can also use, but is not limited to also using the following items to check compliance: Electronic Parts Catalog (EPC), Technical Information System (TIS), and the FIA/ASN Homologation forms (or equivalent documentation).

The specifications within this form include all modifications that have been approved by SCCA Pro Racing specifically for the vehicle model(s) and year(s) listed on this page. The parts, specifications and assemblies used shall be those for the unmodified stock vehicle, those permitted within the Pro Racing Regulations (PRR) and/or within this VTS. If the stock parts, specifications and/or assemblies exceed the performance potential of those approved within this form, then the parts, specifications and/or assemblies used shall meet those listed within this form.

Refer to SCCA PRR and Appendix A. for rules regarding all vehicle specifications not specifically listed within the VTS.

The most current rules can be downloaded from the official website: www.world-challenge.com and look under the "Competitors" section for latest Technical Bulletins, Participant Bulletins, and Appendix A.

This Vehicle Technical Specification sheet is a permissive document. The exact configuration of any modification allowed within this VTS is subject to the approval of the TECHNICAL MANAGER.

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1. General Vehicle Description

1.A. Body Type:	<u>Sedan</u>	1.B. Engine Location:	<u>Front</u>
1.C. Drive Wheels:	<u>Rear</u>	1.D. Wheelbase:	<u>2761 mm</u>
1.E. Induction Type:	<u>Naturally Aspirated</u>	1.F. Competition Weight:	<u>See Appendix A</u>
1.G. Weight Distribution:	<u>See Appendix A</u>		

1.H. Vehicle Miscellaneous:

Modifications permitted in Article 2.8 and Article 2.12 of the 2009 PRR are permitted on this vehicle.

2. Engine

2.A.1. OEM Engine Designation:	<u>N52B25</u>	2.A.3. Number of Cylinders:	<u>6</u>
2.A.2. Maximum Displacement:	<u>2559 cc</u>	2.A.5. Rev Limit Method:	<u>ECU</u>
2.A.4. Rev Limit:	<u>See Appendix A</u>	2.A.7. Maximum Piston Stroke:	<u>78.9 mm</u>
2.A.6. Max. Compression Ratio:	<u>11:1</u>	2.A.9.b. Hole Diameter:	<u>63.6, 61.3, 58.9, 56.4, 53.7 mm</u>
2.A.9. Restrictors:		2.A.10. Direction of Engine Rotation:	<u>Clockwise</u>
2.A.9.a. Percentage Restriction:	<u>30, 35, 40, 45, 50 %</u>		
2.A.9. Cylinder Firing Order:	<u>1.5.3.6.2.4</u>		

2.B. Cylinder Block

2.B.1. Part Number:	<u>11 11 0 401 123</u>	2.B.3. Maximum Cylinder Bore:	<u>83 mm</u>
2.B.2. Cylinder Block Material:	<u>AJ62 Alloy Magnesium / Aluminum</u>		

2.C. Cylinder Head

2.C.1. Part Number:	<u>11 12 7 553 987</u>
2.C.2. Cylinder Head Material:	<u>Aluminum</u>

2.D. Valve System

2.D.1. Number of Valves Per Cylinder:	2.D.1.a. Intake:	<u>2</u>	2.D.1.b. Exhaust:	<u>2</u>
2.D.2. Maximum Valve Head Diameter:	2.D.2.a. Intake:	<u>32.1 mm</u>	2.D.2.b. Exhaust:	<u>26.9</u>

2.E. Intake Port Dimensions

2.E.1. At Intake Manifold Face	2.E.1.a. Height:	<u>30.2 mm</u>	2.E.1.b. Width:	<u>50.2</u>
2.E.2. Intake Port Work Allowed:	<u>Yes</u>	2.E.2.a. Depth From Face:	<u>25 mm</u>	

2.F. Exhaust Port Dimensions

2.F.1. At Exhaust Manifold Face:	2.F.1.a. Height:	<u>36.0 mm</u>	2.F.1.b. Width:	<u>36.0 mm</u>
2.F.2. Intake Port Work Allowed:	<u>No</u>	2.F.2.a. Depth From Face:	<u>Not Applicable</u>	

2.G. Piston and Connecting Rod

2.G.1. Connecting Rod Length:	2.G.1.a. Stock:	<u>154.6 mm</u>	2.G.1.b. Approved:	<u>154.6</u>
2.G.2. Reciprocating Assembly Mass:	2.G.2.a. Stock:	<u>904 g</u>	2.G.2.b. Minimum:	<u>904 g</u>
2.G.3. Aftermarket Rods Allowed:	<u>Yes</u>	2.G.4. Aftermarket Pistons Allowed:	<u>Yes</u>	

2.H. Camshaft

2.H.1. Part Number:	<u></u>	or 2.H.2. SCCA Profile Number:	<u>BMWE901A</u>
2.H.3. Rocker Arm Ratio:	<u>1.64:1 (I) / 1.66:1 (E)</u>	2.H.4. Valve Actuation:	<u>Rocker Arm</u>
2.H.5. Type of Cam Follower:	<u>Roller / Solid</u>		

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2.I. Crankshaft

2.I.1. Part Number: 11 21 0 402 530
2.I.2. Stock Mass: 20.75 kg 2.I.3. Minimum Mass: 20.75 kg

2.J. Flywheel

2.J.1. Stock Ring Gear Diameter: 290 mm

2.L. Intake Manifold

2.L.1. Part Number: 11 61 7 559 523
2.L.2. Stock Port at Cylinder Head Face: 2.L.2.a. Height: 30.2 mm 2.L.2.b. Width: 50.35 mm
2.L.3.a. Allow Port Match to Head: No 2.L.3.b. Port Matching Depth: Not Applicable
2.L.4.a. Throttle Body Bore Dia.: 76 mm 2.L.4.b. Throttle Body Part Number: 13 54 7 516 946
2.L.5. Number of Throttle Bodies: 1 2.L.6. Butterflies per Throttle Body: 1
2.L.7. Intake Manifold Material: MPEM 2.L.8. Manifold Pieces: 1
2.L.8.a. Intermediate Port Matching Allowed: N/A 2.L.9.b. Depth from Face: Not Applicable

2.M. Required Engine Seal Locations

2.M.1. Valve Cover Seal #1: Passenger Side Front.
2.M.2. Oil Pan Seal #2: Passenger Side Front.

2.N. Engine Miscellaneous:

Port work allowed from combustion side 48 mm in intake port.
Dry sump system is permitted with 10 lb. penalty. The dry-sump system is limited to three (3) stages consisting of one (1) pressure stage and a maximum of two (2) scavenge stages. If the OE-style pressure pump is used it shall count as the one permitted pressure stage. There may be a maximum of one (1) two-port scavenge stage, or a maximum of two (2) single-port scavenge stages, such that oil is not being scavenged from more than a maximum of two locations.
Electric water pump may be replaced and/or relocated.

3. Drivetrain

3.A. Transmission

3.A.1. Number of Forward Speeds: 6 3.A.2. Manufacturer: XTrac
3.A.3. Gear Ratios: 3.A.3.a. 1st: 3.000 3.A.3.b. 2nd: 2.214 3.A.3.c. 3rd: 1.647
3.A.3.d. 4th: 1.316 3.A.3.e. 5th: 1.120 3.A.3.f. 6th: 1.000
3.A.4. Gear Shift Pattern: Sequential 3.A.5. Gear Engagement: Dog Ring

3.C. Final Drive

3.C.1. Axle Ratio: 3.91 or 4.10 3.C.2. Drop Ratio: 1.043

3.D. Drivetrain Miscellaneous

Axles (BimmerWorld Part Numbers E90WCTC.33.01 and E90WCTC.33.02) or other aftermarket equivalent permitted.
XTrac Sequential Transmission has an additional input drop gear reduction. Ratio is 23:24 (1.043). Alternate diameter clutch, 5.25" allowed with Xtrac.

4. Suspension

4.A.1. Suspension Type: 4.A.1. Front: MacPherson Strut 4.A.2. Rear: Multilink

4.B. Suspension Miscellaneous

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The following alternate suspension components are allowed:

Rear Carrier Subframe	(BMW Part Number: 33 30 8 282 373)
Front Tension Strut	(SCCA Pro Drawing Number: E90_325.001)
Front Wishbone	(SCCA Pro Drawing Number: E90_325.011)
Front Tie Rod	(SCCA Pro Drawing Number: E90_325.012)
Rear Toe Link	(SCCA Pro Drawing Number: E90_325.005)
Rear Camber Link	(SCCA Pro Drawing Number: E90_325.006)
Rear Control Arm	(SCCA Pro Drawing Number: E90_325.007.1 and E90_325.007.2)
Rear Trailing Arm	(SCCA Pro Drawing Number: E90_325.013)
Rear Guiding Link	(SCCA Pro Drawing Number: E90_325.015)

The spindle and/or outer joint on the a-arm and/or strut may be moved in order to correct bump steer caused by changing the vehicle ride height. These components are not limited to the 25mm of movement that applies to the suspension pick-up points located on the chassis.

The actual wheelbase being used may be adjusted due to pick-up point relocation, approved alternate control arms, etc. Steering rack may be relocated 2" forward to correct bump steer.

5. Chassis

5.A. See Technical Department for information

5.B. Chassis Miscellaneous

Original suspension pick-up points below the line of the wheel rim must be used within a tolerance of 25mm; however, the body/frame around the pick-up points may be reinforced. This reinforcement shall be limited to a radius of six inches (6"). The 25mm tolerance applies to pick-up points on chassis only.

Suspension mounting points above the upper line of the wheel rim must be retained within a tolerance of 75mm, however, the body/frame around the pick-up points may be reinforced. This reinforcement shall be limited to a radius of six inches (6"). The 75mm tolerance applies to pick-up points on chassis only.

6. Body

6.A.1. Stock Coefficient of Drag:	<u>.30</u>	6.A.2. Total Frontal Area:	<u>2.109 m²</u>
6.B. Body Overhang:	2.B.1. Front: <u>754 mm</u>	2.B.2. Rear:	<u>1011 mm</u>
6.C. Stock Body Materials:	<u>Steel body with plastic front and rear fascias.</u>		
6.D. Maximum Body Width:	<u>1784 mm</u>		

6.F. Body Miscellaneous:

Front bumper cover (BMW Part Number 51 11 8 041 132 and related trim) allowed.
Rear bumper cover (BMW Part Number 51 12 7 906 501 and related trim) allowed.

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Camshaft Profile

SCCA Profile Number: BMW E901A
Vehicle: BMW N52.B25 Engine for E90 325 (2.5 liter)

Intake Lobe	Cam Lift (in)	Duration (°)	Open	Close	Area
	0.010	349.26	67.32 BTDC	101.94 ABDC	24.62
	0.020	333.48	59.97 BTDC	93.51 ABDC	24.50
	0.030	320.42	53.87 BTDC	86.55 ABDC	24.34
	0.040	308.52	48.30 BTDC	80.22 ABDC	24.13
	0.050	297.22	43.02 BTDC	74.20 ABDC	23.88
	0.060	286.24	37.89 BTDC	68.34 ABDC	23.58
	0.070	275.42	32.87 BTDC	62.55 ABDC	23.22
	0.080	264.66	27.88 BTDC	56.78 ABDC	22.82
	0.090	253.84	22.88 BTDC	50.96 ABDC	22.36
	0.100	242.89	17.82 BTDC	45.07 ABDC	21.84
	0.150	183.17	10.04 ATDC	13.21 ABDC	18.09
	0.200	99.55	50.48 ATDC	29.97 BBDC	10.68

Maximum Lift: **0.22177**

Exhaust Lobe	Cam Lift (in)	Duration (°)	Open	Close	Area
	0.010	285.48	61.19 BBDC	44.29 ATDC	20.37
	0.020	271.37	54.08 BBDC	37.29 ATDC	20.27
	0.030	260.49	48.63 BBDC	31.86 ATDC	20.13
	0.040	250.99	43.87 BBDC	27.13 ATDC	19.97
	0.050	242.22	39.48 BBDC	22.74 ATDC	19.77
	0.060	233.83	35.30 BBDC	18.53 ATDC	19.54
	0.070	225.62	31.22 BBDC	14.40 ATDC	19.27
	0.080	217.47	27.19 BBDC	10.29 ATDC	18.97
	0.090	209.27	23.13 BBDC	6.14 ATDC	18.62
	0.100	200.93	19.01 BBDC	1.91 ATDC	18.22
	0.150	154.21	3.91 ABDC	21.88 BTDC	15.28
	0.200	85.61	37.55 ABDC	56.84 BTDC	9.19

Maximum Lift: **0.22223**

Permitted Cam Tolerances

Camshafts used for this car must meet the specifications above within the following tolerances:

Duration at the seat	(From 0.020" lift to 0.030" lift)	+/- 6.5 degrees
Duration on flank	(From 0.100" lift to 0.100" before maximum lift)	+/- 4.0 degrees
Duration over nose	(From 0.100" before maximum lift up to maximum lift)	+/- 6.0 degrees
Maximum Lift	(This tolerance applies to maximum lift only)	+/- 0.005 in (0.127 mm)