

24H SERIES

POWERED BY  **HANKOOK**

Balance of Performance Publication

Date: 21.02.2022

HANKOOK 12H MUGELLO 2022

To Sporting & Technical Regulations 24H SERIES powered by Hankook 2022
(Version 8 September 2021 with KNAF permit No.: 0314.21.231)

Dear Teams and Drivers

These Balance of Performance and other figures are in force with immediate application and replaces the figures of appendix 11 of the Sporting & Technical regulations and eventually previously published BOP-publications.

Notes on boost control:

Control of Pboost strategy as per document attached (Appendix: Control of Pboost strategy is updated), for all cars of which Pboost max is specified, unless explicit otherwise specified.

Approved:
Creventic

Creventic B.V.
P.O. Box 40
6590 AA GENNEP (NL)
Tel. +31 (0) 485 471166
Email: info@creventic.com

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For all Classes except class 991 and class GT3

SEMI-PRO-BOP

This "SEMI-PRO-BOP" refers to Series Bulletin 02/2021 Art. 8.3.2 Team Composition.

This "SEMI-PRO-BOP" is applicable for a team with drivers-line up with ONLY SEMI-PRO drivers.

BOP	Balance of Performance*	
	Weight	Refuelling
SEMI-PRO-BOP	+ 30 kg	-/- 5 L

* BOP adjusted (+/-) ballast weight and refuelling amount, referred to initial value specified in this BOP-publication)

Class TC: Touring Cars

Brand & Type	Cylinder capacity	Turbo	Minimum Weight	Max Refuelling amount	Remarks
BMW M240i Racing Cup	3000 cc	Twin Turbo	1440 kg	85L @ Green 85L @ Code60	According to BMW M240i Cup regulations 2020 Car height minimum 100mm
BMW E46 M3	3200 cc	No	1200 kg	120 L	
BMW M2 CS (365HP)	3000 cc	Twin Turbo	1530 kg	85 L	No power stick (365HP) Datalogger AIM Evo5 mandatory

Your (TC) car not listed here? Please make an individual request to info@creventic.com

Class TCX: Special Touring Cars

Brand & Type	Cylinder capacity	Turbo	Minimum Weight	Max Refuelling amount	Remarks
Ligier JS2 R	3700 cc	No	1050 kg	110 L	
Lotus Elise Cup PB-R	1800 cc	Turbo	800 kg	100L @ Green 100L @ Code60	
Ginetta G55	3700 cc	No	1100 kg	110 L	
Porsche Cayman GT4 Club Sport (type 981)	3800 cc	No	1325 kg	110 L	
Porsche 718 Cayman GT4 Club Sport (type 982)	3800 cc	No	1325 kg	110 L	
BMW M240i Racing Cup	3000 cc	Twin Turbo	1440 kg	85L @ Green 85L @ Code60	Technical Regulations according Class TCX Car ride height is free
BMW M240i	3000 cc	Twin Turbo	1330 kg	120 L	
BMW M2 CS (450HP)	3000 cc	Twin Turbo	1530 kg	85 L @ Green 85L @ Code60	Black power stick (450HP)
SEAT LEON (DSG)	2000 cc	Turbo	1240 kg	100 L	Car ride height is free ECU Software version: 5F6906259L
Seat Leon Cup Racer V1 DSG	2000 cc	Turbo	1200 kg	120 L	Car ride height is free ECU Software version: 5F6906259L_0001
Lamera	2500 cc	Turbo	1150 kg	110 L	Datalogger AIM Evo4 or Evo5 mandatory Max Pboost: 1,8 bar (400HP) Independent of Ambient pressure

Your (TCX) car not listed here? Please make an individual request to info@creventic.com

BOP HANKOOK 12H MUGELLO 2022

Class TCR BOP and ECU-software version

Brand & Type	Minimum Weight	Max Refuel amount	Ride height	TCR Technical form	Power level (%)	SW Name ECU-software version	SW Identification (Checksum or ID)	Max Pboost* & Rev limiter	Correct (mbar/C)
ALFA ROMEO GIULIETTA RF TCR	1245 kg	100 L	70mm	22					
AUDI RS3 LMS SEQ	1245 kg	100 L	70mm	10					
AUDI RS3 LMS DSG	1250 kg	100 L	70mm	9					
AUDI RS3 LMS TCR	1250 kg	100 L	70mm	240					
CUPRA TCR SEQ	1250 kg	100 L	70mm	35					
CUPRA TCR DSG	1240 kg	100 L	70mm	43					
CUPRA Leon Competicion TCR	1250 kg	100 L	70mm	169					
HONDA CIVIC FK7 TCR SEQ	1260 kg	100L	70mm	33					
HONDA CIVIC FK2 TCR SEQ	1240 kg	100L	70mm	11					
HYUNDAI i30 N TCR	1270 kg	100 L	90mm	27					
HYUNDAI Veloster N TCR	1275 kg	100L	90mm	97					
KIA CEE'D TCR	1245 kg	100 L	70mm	24					
Lynk&Co 03 TCR	1275 kg	100 L	80mm	101					
MG 6 XPOWER TCR	1250 kg	100 L	70mm	139					
OPEL ASTRA TCR	1250 kg	100 L	70mm	5					
PEUGEOT 308 TCR	1230 kg	100 L	70mm	37					
RENAULT MEGANE RS TCR	1240 kg	100 L	60mm	121					
SUBARU STI TCR	1245 kg	100 L	70mm	7					
VOLKSWAGEN GOLF GTI TCR SEQ	1245 kg	100 L	60mm	14					
VOLKSWAGEN GOLF GTI TCR DSG	1235 kg	100 L	60mm	12					

**TCR ECU-software MUST be according
TCR Technical Bulletin no. 14-2021 dated: 28.10.2021**

*Boost pressure will be monitored according to: TCR Turbocharger Boost Monitoring Method, dated: 2021-03-29

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Class GT4: GT4 Grand Touring Cars

Brand & Type	Cylinder capacity	Minimum Weight	Max Refuelling amount	Restrictor	Remarks *
ASTON MARTIN VANTAGE AMR GT4	4000cc/8cyl Turbo	1450 kg	105 L	NA	Max Pboost bar Acc. 2021 MAP 3 (ref. point 1864mbar@4500rpm)
AUDI R8 LMS GT4	5200cc/10cyl	1470 kg	110 L	2x44mm	Restrictor thickness 5mm. Acc. Audi R8 GT4 restrictor drawing
BMW M4 GT4	3000cc/6cyl Turbo	1440 kg	105 L	USB Powerstick "GOLD" (Max Engine power: 460Hp)	
CHEVROLET CAMARO GT4		1430 kg	100 L	64mm	FIA-restrictor design ECU BOP 2020
FORD MUSTANG GT4	5200cc/8cyl.	1500 kg	110 L	No restrictor	
GINETTA G55 GT4	3700cc/6cyl	1100 kg	95 L	68mm	Restrictor: G55-E0398 FIA-restrictor design
GINETTA G56 GT4		1250kg	95 L	48mm	
KTM X-BOW GT4	2000cc/4cyl Turbo	1120 kg	70 L	Max Pboost 2,0 bar Max rpm 7000 rpm (at all gears)	
MCLAREN 570S GT4	3800cc/8cyl Turbo	1440 kg	110 L	ECU 2019 BOP	
MERCEDES AMG GT4	4000cc/8cyl Turbo	1470 kg	100 L	Max Pboost 1,69 bar (Power Level 5 MAP BOP 2020 (Max Engine power: 305kW)	
PORSCHE CAYMAN GT4 CLUPSPORT MR	3800cc/6cyl	1272 kg	100 L	ECU 2018 BOP	
PORSCHE 718 CAYMAN GT4 CS MR	3800cc/6cyl	1300 kg	100 L	ECU 2021 BOP	

* Specified Max Pboost pressure are absolute pressure at ambient of 1010mbar.

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Class 991: Porsche 991 Cup classes (Generation I and II) Including BOP- table class 991-PRO & 991-AM

Type	BOP**	Minimum Weight	Max Refuelling amount	Fuel flow***	Remarks
Cup 991-I (3800cc)	BOP-AM	1220 kg	100L@Green 100L@Code60	100%	Models 2013 .. 2016 NO Restrictor-Blende
Cup 991-I (3800cc)	BOP-PRO	1220 kg	120L	100%	Models 2013 .. 2016 NO Restrictor-Blende *Note: Fuel tank capacity is 100L. Max fuel sticker: 120L just for practical reasons, so max refuelling will be <ul style="list-style-type: none"> • 100L @green • 60L @Code60
Cup 991-II (4000cc)	BOP-AM	1230 kg	100L	100%	Models 2017 .. 2019 NO Restrictor-Blende
Cup 991-II (4000cc)	BOP-PRO	1230 kg	100L	80%	Models 2017 .. 2019 NO Restrictor-Blende*

* Restrictor Blende must be according "Manthey TZN" drawing, see 24H Series regulations, appendix 9

** Class and corresponding BOP is determined by Team composition (Drivers categories)

Please note: In case Class 991-AM and 991-PRO is combined to one Class 991, the BOP, 991-AM-BOP or 991-PRO-BOP is still applicable determined by Team composition (Drivers categories)

*** Fuel flow is % of max fuel flow. The fuel flow restriction is fully integrated in the fuel pumps and works fully automatic. When cars with an assigned fuel flow restriction refuel, the fuel pump will automatically stop for a set amount of time each ten seconds. This way, the difference in fuel consumption over the entire course of the race is compensated.

Class 992: Porsche 992 Cup classes Including BOP- table class 992-PRO & 992-AM

Type	BOP**	Minimum Weight	Max Refuelling amount	Fuel flow***	Remarks
Porsche 992 Cup	BOP-AM	1280 kg	110L	100%	Models 2021 .. 2022 NO Restrictor-Blende
Porsche 992 Cup	BOP-PRO	1280 kg	110L	80%	Models 2021 .. 2022 NO Restrictor-Blende

** Class and corresponding BOP is determined by Team composition (Drivers categories)

Please note: In case Class 992-AM and 992-PRO is combined to one Class 992, the BOP, 992-AM-BOP or 992-PRO-BOP is still applicable determined by Team composition (Drivers categories)

*** Fuel flow is % of max fuel flow. The fuel flow restriction is fully integrated in the fuel pumps and works fully automatic. When cars with an assigned fuel flow restriction refuel, the fuel pump will automatically stop for a set amount of time each ten seconds. This way, the difference in fuel consumption over the entire course of the race is compensated.

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Class GT3-BOP-TABLE

Class*	BOP	Balance of Performance**	
		Weight	Refuelling
GT3-PRO teams in Class GT3	BOP-Pro	+ 30 kg	-/- 5 L
GT3-PRO/AM	BOP-PRO/AM	+/- 0 kg	+/- 0 L
GT3-AM	BOP-AM	+/- 0 kg	+ 15 L More Engine Power, see GT3- BOP-table
	BOP-AM Advantage	+/- 0 kg	Same as AM-BOP plus: 100% max refuelling @ CODE-60***

* Class and corresponding BOP is determined by Team composition (Drivers categories)

Please note: In case Class GT3-AM a the BOP (BOP-AM or BOP-AM-Advantage is determined by Team composition (Drivers categories)

** BOP adjusted (+/-) ballast weight and refuelling amount, referred to initial value specified in GT3-BOP below

*** E.g. if initial max refuelling is 100 Litre: You are allowed to refuel 115 L @ green and you are allowed to refuel 115 Litre during CODE-60.

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Class GT3 including GT3-PRO/AM and GT3-AM (Mainly GT cars)

Brand & Type	Minimum Weight	Max Refuel amount	Fuel flow**	Restrictor	Max Pboost *
ASTON MARTIN VANTAGE AMR GT3	1290 kg	110 L	100%	N/A	Max Pboost ratio/rpm 1,62/4000 1,67/4500 1,75/5000 1,81/5500 1,84/6000 1,83/6500 1,72/7000 1,63/7200 1,40 > 7300 AM-BOP 1,77/4000 1,78/4500 1,85/5000 1,92/5500 1,95/6000 1,95//6500 1,83/7000 1,77/7200 1,40 > 7300
AUDI R8 LMS GT3 (GT3-038) EVO I	1280kg	100 L	95%	2x40,0mm AM-BOP: 2x43mm	
AUDI R8 LMS GT3 (GT3-038) EVO II (2022)	1310kg	100 L	95%	2x37,0mm AM-BOP:2x40mm	FIA restrictor design acc. 2022 homologation regulations Group GT3
BMW M4 GT3	1290 kg	100 L	95%	N/A	Max Pboost ratio/rpm 2,36/4000 2,44/4500 2,55/5000 2,62/5250 2,70/5500 2,76/5750 2,81/6000 2,83/6250 2,76/6500 2,66/6750 7000/2,54 AM-BOP: Tba
BMW M6 GT3	1310 kg	105 L	100%	N/A	Max Pboost ratio/rpm 1,78/4000 1,86/4500 1,94/5000 1,98/5500 1,92/6000 1,78/6500 1,62/7000 1,30/7250 AM-BOP: Tba
FERRARI 488 GT3	1280 kg	97 L	92,5%	N/A	Max Pboost ratio/rpm 1,47/4000 1,51/4500 1,55/5000 1,59/5500 1,61/6000 1,57//6500 1,54/7000 1,49/7250 1,47/7500 1,35/>7600 AM-BOP: 1,54/4000 1,59/4500 1,63/5000 1,67/5500 1,69/6000 1,65//6500 1,62/7000 1,56/7250 1,54/7500 1,35/>7600
FERRARI 458 ITALIA GT3 (EVO 2015)	1300 kg	110 L	100%	2x55,5mm AM-BOP Tba	
LAMBORGHINI HURACAN GT3	1310 kg	105 L	95%	2x39,0mm AM-BOP: 2x42mm	
McLaren 720S GT3	1230kg	105 L	100%	N/A	Max Pboost ratio/rpm 1,78/4000 1,75/4500 1,72/5000 1,70/5500 1,62/6000 1,56//6500 1,45/7000 1,40/7500 1,34/8000 1,12/8100 AM-BOP Tba
MERCEDES AMG GT3	1320kg	105 L	100%	2x35,0mm AM-BOP: 2x38mm	
PORSCHE 911 GT3 R (991 I & 991 II)	1290 kg	95 L	92,5%	2x41,5mm AM-BOP: 2x45mm	

All restrictors must be acc. FIA-restrictor design 2016 GT RESTRICTOR GEOMETRY Group GT3 (unless explicit described otherwise)

* Values are boost pressure ratio and need to be multiplied by the ambient pressure to get the Pboost limit.

Competitors must adjust boost pressure relative to ambient pressure at each event. Pboost limits linear interpolation approach.

** Fuel flow is % of max fuel flow. The fuel flow restriction is fully integrated in the fuel pumps and works fully automatic. When cars with an assigned fuel flow restriction refuel, the fuel pump will automatically stop for a set amount of time each ten seconds. This way, the difference in fuel consumption over the entire course of the race is compensated.

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Class GTX Special GT cars

Brand & Type	Cylinder capacity	Minimum Weight	Max Refuelling amount	Fuel flow**	BOP	Remarks
Lamborghini Huracán Super Trofeo	5200 cc	1300 kg	110 L	100%	2 x 41mm	Datalogger AIM Evo 4 or Evo5 mandatory
Lotus Exige V6 Cup R	3500 cc	1000 kg	120 L @ Green 120L @ Code60	100%	Pboost: TBA	Datalogger AIM Evo 4 or Evo5 mandatory
MARC II V8	5200 cc	1150 kg	120 L	100%	NA	NA
Vortex 1.0	6200 cc	950 kg	120 L @ Green 120L @ Code60	100%	NA	NA
BMW M4 Silhouette	3400 cc	1050 kg	120 L	100%	NA	NA
KTM X-BOW GTX	2500 cc	1100 kg	90 L	90%	2,2bar (independent of Pamb), max rpm 7000	Datalogger AIM Evo 4 or Evo5 mandatory
Audi R8 LMS GT2	5200 cc	1350 kg	110 L	100%	2 x 60mm	Datalogger AIM Evo5 mandatory
Porsche 911 GT3 Cup 991 MR	4000 cc	1220 kg	120 L	100%	NA	NA

Please note: Art. 3.3 of Appendix 7 of the Sporting & Technical regulations

Your (GTX) car not listed here? Please make an individual request to info@creventic.com

** Fuel flow is % of max fuel flow. The fuel flow restriction is fully integrated in the fuel pumps and works fully automatic. When cars with an assigned fuel flow restriction refuel, the fuel pump will automatically stop for a set amount of time each ten seconds. This way, the difference in fuel consumption over the entire course of the race is compensated.

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Appendix: Control of Pboost strategy

