



2015 Classing System For NSW Production Touring Category

Author: Technical Committee

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Executive Summary

The NSW Production Touring Category has grown from the old Street Sedan category and has in recent years been hugely successful with growing grids, lots of new competitors with new types of vehicles. This has put the current non-published classing system under strain to correctly classify these new styles of vehicle within the existing vehicles. The dynamics of some of these vehicles does not fit well with handling prowess as opposed to straight-line performance through large capacity engines. This has highlighted the need for a robust published classing system that can be used by competitors to determine their class.

The purpose of this document is to detail a formula based system based on readily available data for some key performance based aspects of the vehicles, namely: power, weight, torque, drivetrain and factory performance vehicles.

These factors are applied to give a class factor. This is then used to place the vehicles in classes with cars of similar performance.

This system for classing will be used from 2015 onwards.

Determining the Factors

There are many factors that determine the performance of a vehicle on a race track. The following are some of the key factors that are used or not used and the logic behind their choice.

Power

The power of a vehicle is the most common determinate to performance in that acceleration is directly attributed to power and acceleration is highly important in the speed achieved down a straight. Therefore Power MUST be used in any calculation. With production car categories such as Production Touring the power cannot be varied significantly so therefore the published power figures in Kilowatts available on the RVD documents can be used for this value.

Torque

The variety of engines used in the category from four to eight cylinders, some with forced induction creates great variation in Torque. Torque is also a major determinate in how a vehicle accelerates particularly coming out of corners. The torque for production cars again should not vary greatly for production cars, therefore the published torque values can be used. Torque also caters for engine types such as V8 which have high power and high torque, diesels which have

relatively low power with high torque and cars such as rotaries which have relative high power but low torque.

Unfortunately the Torque values are not recorded on the RVD so an alternate source was needed. Redbook is a trusted industry source that uses manufacture's published data and is readily available online at redbook.com.au. The Redbook value of Torque in NM is used.

Weight

The enemy of power and torque is weight, as the power needs to overcome the weight to achieve the acceleration. Therefore the weight of the vehicles must be taken into account. The published values on the vehicles RVD can be used after applying the CAMS 3E weight calculation to determine the race weight of the vehicle in Kilograms.

Drivetrain

There are three general types of drivetrain used, rear wheel drive, front wheel drive and four or all wheel drive. The two wheel drive vehicles are at a significant disadvantage to the all wheel drive vehicles so a factor to compensate is used to offset this advantage in the calculation. The AWD factor has been set as 1.5.

Factory Performance Vehicles

Some vehicles from particular manufacturers (such BMW Motorsport, Renault, AMG and HSV) are significantly upgraded and have advantages in handling and braking which gives those vehicles an advantage in balance and cornering ability. Therefore a factor to compensate is used to offset this advantage in the calculation. The Factory Performance Vehicles factor has been set as 1.15.

Other Factors

Some other factors were considered but rejected. Brakes were one of these factors however as the 3E rules allows for limited upgrades of Brakes, eg from sliding calipers to 4 spot calipers and thicker disks and therefore the standard brakes can not be used to gauge performance. Suspension setup and tuning also has a significant impact on performance but as these are relatively free under the 3E rules these factors cannot be used.

The Biggest Single factor

The one factor that really impacts the performance of similar vehicles is the experience and capability of the driver. This can be measured by lap time differences between the same vehicles. However drivers should not be

disadvantage by being placed in a higher class due the experience or ability. So driver ability is not factored into allocating cars to classes.

The Formula

The formula to calculate the Class Factor is as follows:

$$\text{Class Factor} = \frac{\text{Race Weight KG}}{\text{Power KW}} \times \frac{\text{Race Weight KG}}{\text{Torque NM}} / \text{AWD Factor (1.5)} / \text{Factory Performance (1.15)}$$

How to calculate your Class Factor:

Gather the data required

1. Locate the RVD for your vehicle - <http://myrta.com/rvd/searchRVD.do>
 - Record the Tare Mass (Kg)
 - Record the NEP (kW)
2. Look up your vehicle on Redbook - <http://www.redbook.com.au/>
 - Record the Torque (Nm)
3. Calculate the race weight.
 - Take the Tare Mass from step 1 multiply by the percentage reduction as per the CAMS 3E rules (see table below) and add 85 Kg give you the race weight.

Tare Mass	Percentage reduction
1299 or less	2
1300 – 1349	3
1350 – 1399	4
1400 – 1449	5
1450 – 1499	6
1500 – 1549	7
1550 – 1599	8
1600 – 1649	9
1650 – 1699	10
1700 or greater	11

Perform the Calculation

1. Calculate the Power to weight (PWR) value

Divide the Race Weight in Kilograms by the RVD Power in Kilowatts

2. Calculate the Torque to weight (TWR) value

Divide the Race Weight in Kilograms by the Redbook Torque in Newton Metres

3. Multiply the Power to Weight by the Torque to Weight values

4. Apply the AWD Factor if appropriate. Take value from step 3 and divide by AWD Factor. The AWD Factor is 1.5.

5. Apply the Factory Performance Vehicle Factor if appropriate. Take value from step 4 and divide by Factory Performance Vehicle Factor. The Factory Performance Vehicle Factor is 1.15.

6. Take the resultant number (class factor) and determine where it fits within the class brackets.

Class Brackets

The following are the suggested class brackets:

Class	Maximum Class Factor
A1	17
A2	17
B1	25
B2	25
C	40
D	55
E	>55

Exceptions

There will always be exceptions to the formula, particularly if vehicles do not have the required RVD or Redbook entries. These vehicles will have to use information from alternate sources to try and class these vehicles. The Production Touring committee will allocate the vehicle to a class. Examples are Mitsubishi Evolution vehicles and Nissan GTiR.

This system should be suitable for the majority of the vehicles that race with the Production Touring category.

Examples

The following are examples:

A. Holden Commodore VE SS

Race weight = RVD Weight 1684 Kg less 10% plus 85KG = 1600Kg
RVD Power = 270KW
Redbook Torque = 530Nm

1. Power to weight = $1600\text{KG}/270\text{Kw} = 5.93$
2. Torque to Weight = $1600\text{KG}/530\text{Nm} = 3.02$
3. Multiply together = $5.93 \times 3.02 = 17.90$
4. Apply AWD factor = Not applicable
5. Apply Factory Performance Vehicle factor = Not applicable
6. Compare Class Factor to class brackets = $17.90 = \text{class B2}$

B. BMW E46 M3

Race weight = RVD Weight 1455 Kg less 6% plus 85KG = 1452Kg
RVD Power = 252KW
Redbook Torque = 365Nm

1. Power to weight = $1452\text{KG}/252\text{Kw} = 5.76$
2. Torque to Weight = $1563\text{KG}/530\text{Nm} = 3.98$
3. Multiply together = $5.76 \times 3.98 = 22.94$
4. Apply AWD factor = Not applicable
5. Apply Factory Performance Vehicle factor = $22.94/1.15 = 19.95$
6. Compare Class Factor to class brackets = $19.95 = \text{class B2}$

C. Subaru WRX Sti MY10

Race weight = RVD Weight 1465 Kg less 5% plus 85KG = 1462Kg
RVD Power = 221KW
Redbook Torque = 407Nm

1. Power to weight = $1462\text{KG}/221\text{Kw} = 6.62$
2. Torque to Weight = $1462\text{KG}/407\text{Nm} = 3.59$
3. Multiply together = $6.62 \times 3.59 = 23.77$
4. Apply AWD factor = $23.77/1.5 = 15.84$
5. Apply Factory Performance Vehicle factor = Not applicable
6. Compare Class Factor to class brackets = $15.84 = \text{class A1}$

D. Mitsubishi Evolution IX RS

Race weight = No RVD data
RVD Power = No RVD data

Redbook Torque = No Redbook data
Therefore class assigned by Production Touring Committee

Appendix A – Class Table

The class definitions have remained the same as for 2014 with the addition of Class E Small Capacity Touring cars.

The proposed Approved Car List for 2015 based on using the formula is listed below. Vehicles marked with an * have been assigned to a class by the Production Touring committee as they do not have appropriate RVD or Redbook data.

The class definitions have remained the same as for 2014 with the addition of Class E Small Capacity Touring cars.

Manufacturer	Model	Capacity	Induction	AWD Factor	Factory Performance Factor
Class A1					
Holden	VF GTS	6162	Supercharged		Y
BMW	E82 1M Coupe	2998	Turbo		Y
Subaru	WRX Sti MY07	2457	Turbo	Y	
Subaru	WRX Sti MY10	2457	Turbo	Y	
Subaru	WRX Sti MY13	2457	Turbo	Y	
Subaru	WRX Sti MY98	1994	Turbo	Y	
BMW	F22 M235I	2979	Turbo		Y
Ford	FG GT-P	5000	Supercharged		Y
Mitsubishi	EVO VI*	1997	Turbo	Y	
Mitsubishi	Evo X RS	1997	Turbo	Y	
Mitsubishi	Evo IX*	1997	Turbo	Y	
Mitsubishi	EVO VIII*	1997	Turbo	Y	
Mitsubishi	EVO VII*	1997	Turbo	Y	
Class B1					
Ford	BF2 F6 Typhoon	4000	Turbo		
Ford	FG2 XR6 Turbo	4000	Turbo		
Ford	BF2 XR6 Turbo	4000	Turbo		
BMW	E82 135i	2998	Turbo		
BMW	E92 335i	2998	Turbo		
Subaru	WRX Sti MY05	1994	Turbo	Y	
Mazda	6 MPS	2261	Turbo	Y	
Mitsubishi	EVO V*	1997	Turbo	Y	
Renault	Megane Sport 265	1998	Turbo		Y
Class A2					
Holden	VF Clubsport R8	6162	NA		Y
Holden	Monaro GTO	5967.0	NA		Y
Holden	VZ Clubsport R8	6000.0	NA		Y
Holden	VE3 Clubsport R8	6162	NA		Y
Holden	Monaro GTS	5700.0	NA		Y
Holden	VE GTS	6162	NA		Y
BMW	E92 M3	3999	NA		Y
Holden	VY GTS	5700	NA		Y
Holden	VT GTS	5667	NA		Y

Manufacturer	Model	Capacity	Induction	AWD Factor	Factory Performance Factor
Class B2					
Holden	VY Clubsport R8	5700	NA		Y
Holden	VE Commodore SSV	5967	NA		
Holden	VF Commodore SS	5967	NA		
Holden	Monaro CV8	5700.0	NA		
Holden	VF Commodore SS	5967	NA		
BMW	E36 M3R	2996	NA		Y
Ford	BF2 GT-P	5.4	NA		
BMW	E46 M3	3246	NA		Y
Holden	VZ Commodore SS	5665	NA		
Holden	VX Clubsport R8	5700	NA		Y
Holden	VZ Commodore SSZ	5665	NA		
Holden	VY Commodore SS	5665	NA		
Holden	VT II Clubsport	5667	NA		Y
Ford	BF2 XR8	5.4	NA		
BMW	E36 M3	3202	NA		Y
Holden	VX Commodore SS	5665	NA		
Class C					
Alfa Romeo	156 GTA	3179	NA		
Mazda	3 MPS	2261	Turbo		
BMW	E87 130i	2996	NA		
VW	Scirocco R	1984	Turbo		Y
Ford	BF2 XR6	3984	NA		
Ford	FG2 XR6	3984	NA		
Mazda	626 Diesel	2191	TD		
BMW	E82 123D	1995	TD		
Mini	R56 Cooper S	1580	Turbo		
BMW	E46 330i Sedan	2979	NA		
Nissan	GTiR*	1998	Turbo		
Renault	Clio RS200	1618	Turbo		Y
Class D					
Toyota	86 GT	1998	NA		
BMW	E82 125i	2996	NA		
Toyota	86 GTS	1998	NA		
Honda	Integra Type R	1998	NA		Y
BMW	E90 325i Sedan	2497	NA		
BMW	E46 328Ci	2793	NA		
BMW	E36 328i Sedan	2793	NA		
Mini	R53 Cooper S	1598	Supercharged		
Class E					
Alfa Romeo	Mito	1368	Turbo		
BMW	E46 325i Sedan	2498	NA		
BMW	E36 323i Sedan	2498	NA		
Honda	Civic Type R	1998	NA		Y
Suzuki	Swift Sport	1586	NA		
Mazda	626	2496	NA		
Class S					
Saloons	CAMS 3K Rules				
Class U					
Ex V8 Utes	As per 2014 Appendix H				

