

# Mitsubishi Lancer Evolution



## Transmission and Differential Information

# Mitsubishi Lancer Evolution Transmission & Differential Information

## Evolution IV, V, VI, VII & VIII Transmission/Differential and other technical Information

The **Mitsubishi Lancer Evolutions IV, V, VI, T.M.Edition, VII & VIII**

have a large variety of transmission and differential options available. This information bulletin is intended to help you choose the correct transmission and differential specification for your purpose and to allow you to comply with the relevant technical regulations.

### **Original Equipment Choices:**

The standard Lancer Evolution IV, V, VI & T.M.Edition cars were produced by Mitsubishi Motors Corporation ("MMC") with two choices of:

- A. Gearbox ratios
- B. Front differential
- C. Final drive ratio

These are standard MMC parts and are all homologated in Groups N & A. In simple terms, they are as follows:

### **A. Gearbox ratios:**

Gear	Teeth	Ratio
1	39/14	2.785
2	39/20	1.95
3	38/27	1.407
4	33/32	1.031
5	32/42	0.761
R	0.461538462 x 41/26	3.416
Constant	xxxx	xxxx

Gear	Teeth	Ratio
1	39/14	2.785
2	39/20	1.95
3	39/27	1.444
4	34/31	1.096
5	33/40	0.825
R	2.166667 x 41/26	3.416
Constant	xxxx	xxxx

### **B. Front differential**

The cars were available with either a normal open differential or a helical gear Limited Slip Differential ('worm gear' type). The front differential and the Viscous Coupling Unit for the centre differential are both located inside the transfer box (not in the main gearbox).

### **C. Final drive ratios**

	Front	E4 Rr	E5/6 Rr
<b>Ratio</b>	4.529	3.323	3.307
<b>No. of teeth</b>	77/17	53/16	43/13

	Front	E4 Rr	E5/6 Rr
<b>Ratio</b>	4.875	3.323	3.307
<b>No. of teeth</b>	78/16	53/16	43/13

The above three items can be used within Group A and N regulations, in many combinations of the three. There is a separate sheet which shows the MMC part No's for these parts, included in our catalogue. Individual parts No's for items within the gearboxes, differentials and transfers can be obtained from the Co-ordSport parts catalogues.

# **Mitsubishi Lancer Evolution Transmission & Differential Information**

## **Competition Differentials:**

Co-ordSport is able to supply a variety of special differentials, as follows:

### **A. Ralliart Front Limited Slip Differential Kit – Original Version (RA763555S1/2)**

This offers a mechanical plated type Front Limited Slip Differential, together with an updated Viscous Coupling Unit ('VCU') for the Centre Differential. The kit includes the LSD unit, the VCU and also replacement output flange and output shafts, together with an 'O' ring seal. Each of these parts is available separately. However, service parts are not always readily available for the LSD unit.

The Ralliart LSD unit can only be fitted with the updated VCU, due to a different PCD on the fitting flange, compared with the standard/original parts. For this reason, this kit is not allowed under Group N regulations.

The Ralliart Front LSD and updated viscous Kit is only homologated for Group A, but is ideal for private drivers who cannot have available a variety of different specification components for different surfaces/events.

The Ralliart mechanical front LSD unit is stronger than a standard/Group N part and is, therefore, more reliable than the original equipment helical gear type LSD.

### **B. Ralliart Front Limited Slip Differential Kit – Latest Versions (RA763555N3/RA580103S1)**

In line with the regulations Ralliart Inc. has homologated an LSD unit to work with the standard viscous coupling of the E5/6 - RA763555N3.

A similar unit has been developed and homologated for the Evolution 7, to work with the Active Centre Diff. (ACD) - RA580103S1

### **C. KAAZ Front and Centre Limited Slip Differential Kits - E4/7**

KAAZ is a Japanese Company, which manufactures LSD units for a range of Japanese makes and models of car. For the Evolution Lancers 1 - 7 they produce two mechanical, plated Limited Slip Differential units, which replace the Front and Centre Differentials. KAAZ also make available service and maintenance parts.

For different conditions and driver preferences the KAAZ LSD can be set-up with different pre-loads. However, the KAAZ LSD's are not legal for use under Group N rules - as they are not homologated and you must retain the standard Viscous Coupling.

For Group A and Open Regulations use the KAAZ front and centre LSD units can be installed. The centre LSD is installed in the gearbox, whilst the original VCU, which as standard is within the Transfer Box, is removed when the front LSD is fitted therein. The KAAZ original casings can prove to be not up to the job, when a big increase of torque and power is achieved. Co-ordSport has available various special components manufactured from better material and with improved heat treatment finish.

### **D. ATS/Cusco Front/Centre Limited Slip Differential Kit**

The LSD's produced by ATS and Cusco are similar to the KAAZ items, but the ATS can only be fitted as a set (ATS Front LSD, with ATS Centre LSD). They are not legal for Group N use and can only be used within Group A or Open Regulations.

We can supply KAAZ, Cusco and ATS LSD kits to suit a large selection of car.

# Mitsubishi Lancer Evolution Transmission & Differential Information

## 5 Speed Competition Transmissions:

Ralliart Inc. has developed, together with Hewland Engineering in the UK, a variant option set of 5 speed ratios, as follows,

<b>Gear</b>	<b>Teeth</b>	<b>Ratio</b>
1	36/12	3.00
2	26/13	2.00
3	25/17	1.47
4	20/18	1.111
5	24/28	0.857
R	2.166666667 x 41/26	3.416
Constant	xxxx	Xxxx

Available with a 4.307 final drive (56/13).

[\\*More details available in the Ralliart Assembly Manual at www.ralliart.com/01topics/topics10/index.html](http://www.ralliart.com/01topics/topics10/index.html)

The complete assembly in a casing is currently priced at £7,500-, whilst the gearkit is £6000-. An assembly jig is required for maintenance, which is priced at £203.04.

This is homologated for the Evo's 5 & 6 (CP9A) and also for the Evolution 7 in Group N. With effect from 01/07/01 any Group N homologation is now also valid for Group A.

Co-ordSport stocks and recommends the Ricardo Transmissions (formerly Gemini) dog-type transmission system with 5 speeds. This is priced at £7,500 for the basic 5 speed version (price is for a kit installed in a new casing), which utilises a standard gearbox casing & mates to a standard transfer, with dog-type gears for added strength and quick gearchanges (ratios and teeth counts are as Group N homologation, or "Special" and gearchange is H-pattern).

The 5 speed dog-type gearbox can utilise any of the above LSD options, but is only homologated in Group N with the standard helical gear type and the new Ralliart homologated version.

## **Ricardo (Gemini) 5-speed dog-type gearbox ratios:**

Homologated (Grp.N) ratios:

Ratio Set No.1 (w/4.529)

<b>Gear</b>	<b>Teeth</b>	<b>Ratio</b>
1	39/14	2.785
2	39/20	1.95
3	39/27	1.444
4	34/31	1.096
5	33/40	0.825
R	2.166666667 x 41/26	3.416
Constant	Xxxx	xxxx

Homologated (Grp.N) ratios:

Ratio Set No.2 (w/4.307)

<b>Gear</b>	<b>Teeth</b>	<b>Ratio</b>
1	36/12	3
2	26/13	2
3	25/17	1.47
4	20/18	1.111
5	24/28	0.857
R	2.166666667 x 41/26	3.416
Constant	xxxx	Xxxx

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Non-Homologated Ratios  
(with any final drive below)

<b>Gear</b>	<b>Teeth</b>	<b>Ratio</b>
1	39/14	2.785
2	39/20	1.95
3	33/20	1.65
4	30/22	1.363
5	34/31	1.096
R	2.166666667 x 41/26	3.416
Constant	Xxxx	Xxxx

Available with 4.307, 4.529 and 4.875 final gears and now a special 4.2 (15/63), 3.94 final gears (4.2 & 3.9 final drive ratios are not homologated under FIA regulations). For Group N regulations Ratio Set No.1 must be used with 4.529 and Ratio Set No. 2 must be used with 4.307 final ratio. For Group A regulations, either of Set 1 or 2 can be used with any of the 3 homologated final drives.

## **Special Notes**

It is still recommended to use the clutch when changing gear with the dog kits, especially when changing up. This type of gear kit requires more maintenance than a standard gearbox.

More details available in Gemini Assembly Manual at [www.coordsport.com/Transmission.asp](http://www.coordsport.com/Transmission.asp)

# Mitsubishi Lancer Evolution Transmission & Differential Information

## 6 Speed Factory Specification Group A Transmission (E5/6):

Ralliart Inc. makes available the Group A 6-speed X-Trac transmission, with sequential change system.

The gearbox ratios are:

<b>Gear</b>	<b>Teeth</b>	<b>Ratio</b>
1	34/12	2.833
2	33/16	2.063
3	32/19	1.684
4	29/21	1.381
5	27/23	1.174
6	24/24	1.000
R	14/12 x 39/14	3.25
Front Diff (Stepoff)	14/65	4.633
Rr. Diff (Dropoff)	19/25	1.316
Ctr. Diff. (T/F)	24/20	0.833

Special transfer assembly including front LSD (35/5) and Centre Viscous coupling (VCT = 110 Kg/m) is available. Also rear differential with 4.222 ratio (9/38) and LSD (35/5).

The complete package including the following:

- Gearbox
- Triple plate Carbon clutch, by AP Racing
- Transmission oil cooler system (Laminova)
- Transfer assembly
- Propeller Shaft (steel)
- Rear differential assembly
- Gear change mechanism
- Starter Assembly
- Transmission mountings/fixings

is priced around £80,000-. Special Driveshafts are also available, but these depend upon the specification of suspension to be used. An electronically controlled centre differential is also available.

# Mitsubishi Lancer Evolution Transmission & Differential Information

## **Evolution VII**

The Evolution VII was homologated effective 01<sup>st</sup> April 2001 (A/N5629). The basic transmission details are:

### **A. Gearbox ratios (Japanese domestic versions)**

GSR Model (1<sup>st</sup> gear not homologated for motorsports)

<b>Gear</b>	<b>Teeth</b>	<b>Ratio</b>
1	41/14	2.928
2	39/20	1.95
3	38/27	1.407
4	33/32	1.031
5	31/43	0.72
R	2.166666667 x 41/26	3.416
Constant	xxxx	xxxx

RS Model - Brembo brake version(RS-2)

<b>Gear</b>	<b>Teeth</b>	<b>Ratio</b>
1	39/14	2.785
2	39/20	1.95
3	38/27	1.407
4	33/32	1.031
5	31/43	0.72
R	2.166666667 x 41/26	3.416
Constant	xxxx	xxxx

RS Model Hi-cross/15" (option)

<b>Gear</b>	<b>Teeth</b>	<b>Ratio</b>
1	39/14	2.785
2	39/20	1.95
3	39/27	1.444
4	34/31	1.096
5	33/40	0.825
R	2.166666667 x 41/26	3.416
Constant	xxxx	xxxx

### **B. Front Differential**

The cars are available with either the helical gear Limited Slip Differential or a normal open differential. The front differential is housed in the transfer box, together with the Active Centre Differential (ACD) or the alternative Viscous Coupling Unit. (VCU is not homologated).

### **C. Centre Differential**

The cars are available with the all new, electrically controlled Active centre Differential (ACD). Basically this is a multiplate clutch in place of a centre differential with a VCU. Increasing or decreasing the hydraulic pressure to govern the clamping forces between the plates modulates the centre differential's lock ratio.

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## C. Centre Differential cont.

The ACD is operated via an ECU, utilising a variety of information including the driving conditions and the driver's intentions. Sensors track the steering angle, throttle opening, speed of each wheel, longitudinal and lateral Gs, etc.

The driver can choose with just a little flick of a switch, the ACD's three settings: Tarmac, Gravel or Snow. It is anticipated that Ralliart will produce special ECU's for the ACD system, to suit different types of rally road surface types. (e.g. Gravel or Tarmac), although it is uncertain whether these will be permitted for Group N use.

## A. Final drive ratios

GSR Model

	<b>Front</b>	<b>Rear</b>
Ratio	4.529	3.307
No. of Teeth	77/17	43/13

RS Model

	<b>Front</b>	<b>Rear</b>
Ratio	4.529	3.307
No. of Teeth	77/17	43/13

## Co-ordSport Transmission Service

Co-ordSport is able to offer a complete build and overhaul service for all the above transmissions. Call for more details or a quote.

For non-motorsports customers we can also rebuild gearboxes and install alternative options, such as E7 ratios for E5/6's or alternative 4.1:1 final drive.

This bulletin is not intended as a comprehensive guide to all information and data on the transmissions of the Mitsubishi Lancer Evolutions IV,V, VI,VII & VIII (Carisma GT) Rather as a guide which can help you choose which basic package is ideally suited for your purpose. Should you require further detailed information, please do not hesitate to contact the Co-ordSport office.

## **Co-ordSport Limited**

[www.coordsport.com](http://www.coordsport.com)

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## Additional Information

GEAR RATIOS	SET A	SET B	SET C	SET D	SET E	SET F
1st	2.785	2.785	2.928	2.785	3	2.909
2nd	1.95	1.95	1.95	1.95	2	1.944
3rd	1.407	1.444	1.407	1.407	1.47	1.434
4th	1.031	1.096	1.031	1.031	1.111	1.100
5th	0.761	0.825	0.72	0.72	0.857	0.868
6th	-	-	-	-	-	0.693

### **EVO 4**

PART NUMBER	CODE	RATIOS	FINAL DRIVE RATIO	SPEEDO DRIVE GEAR
MD975146	W5M51-1-X6A	A	4.529	29/36
MD975147	W5M51-1-X7A	A	4.529	30/36
MD975148	W5M51-1-Z6A1	B	4.875	29/36
MD975666	W5M51-1-Z7A	B	4.875	30/36
MD975668	W5M51-1-X6A1	B	4.529	29/36
MD975669	W5M51-1-X7A2	B	4.529	30/36

### **EVO 5 & 6**

PART NUMBER	CODE	RATIOS	FINAL DRIVE RATIO	SPEEDO DRIVE GEAR
MD 976580	W5M51-2-X6A	A	4.529	29/36
MD 976581	W5M51-2-X6A1 (X6A5)	A	4.529	29/36
MD 976582	W5M51-2-Z6A	B	4.875	29/36
MD 976583	W5M51-2-X6A2	B	4.529	29/36
MD 976584	W5M51-2-Z6A1	B	4.875	29/36
MD 976585	W5M51-2-X6A3 (X6A7)	B	4.529	29/36

### **EVO 6**

PART NUMBER	CODE	RATIOS	FINAL DRIVE RATIO	SPEEDO DRIVE GEAR
MR581782	W5M51-2-X6A4	A	4.529	29/36
MR581784	W5M51-2-X6A6	B	4.529	29/36
MR581783	W5M51-2-X6A5	?	?	?
MR581785	W5M51-2-X6A7	?	?	?
MR533455	W5M51-2-????	?	?	?

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## **EVO 7**

PART NUMBER	CODE	RATIOS	FINAL DRIVE RATIO	SPEEDO DRIVE GEAR
MR953341	W5M51-2-X5B	C	4.529	28/36
MR953342	W5M51-2-X5B1	D	4.529	28/36
MR953343	W5M51-2-X5B2	B	4.529	28/36
MR953345	W5M51-2-X5B3	D	4.529	28/36
MR953346	W5M51-2-X5B4	B		28/36
RA553455S1	?	E	4.307	28/36

## **EVO 8**

PART NUMBER	CODE	RATIOS	FINAL DRIVE RATIO	SPEEDO DRIVE GEAR
MN132375	W5M51-2-X5BA	B	4.529	?
MN132225	W6MAA-1-GFNF	F	4.583	?

## **USA Model EVO 8**

PART NUMBER	CODE	RATIOS	FINAL DRIVE RATIO	SPEEDO DRIVE GEAR
SYGFZ	W5M51-2-??	C	4.529	

## **Transfer box data -**

MD748267	E4 with LSD (helical)
MD748268	E4 without LSD
MR410523 (MR498816)	E5/6 with LSD (helical)
MR410524	E5/6 without LSD
MR498816 (MR953775)	E6 RS with LSD (helical)
MR498817	E6 without LSD
MR498818	E6 with LSD, option T4U/TLM/SOM/SOL
MR498819	E6 T.M. with LSD, option T42
MR498812	E7 (VCU)
MR498813	E7 (VCU + LSD)
MR580073	E7 (RS with ACD)
MR580104	E7 (ACD + LSD)
MR980314	E7 RS-2
MR980932	E8 (All)

# Mitsubishi Lancer Evolution Transmission & Differential Information

## Rear Diff. Data

### **E4**

MR222000 GSR 3.323 AYC  
MR241340 RS 3.323

### **E5/6**

MR410481 GSR 3.307 AYC  
MR414838 RS/RS-2, 3.307  
MR477548 GSR / RS-2, 3.307 AYC

### **E7**

MR414838 RS 3.307  
MR580010 GSR 3.307 AYC

### **E8**

MN133891  
MR580745

## Group N homologation data, Important notes, especially for Evolution 6 & 7

1. Limited Slip Differentials are allowed at the front and rear of the Evolution 4 - 7 Lancer, provided they are the homologated versions.

2. The following gear ratios are permitted for an Evo. 6 under FIA Group N regulations, from 01/01/01

<b>Car spec.</b>	<b>Ratio Set</b>	<b>Final Drive</b>	<b>Homologation</b>
15" wheel/brakes	Super-Cross ratio	Standard ratio (4.5)	N5585(01/01VO+02/01ET)
15" wheel/brakes	Super-Cross ratio	Low Ratio (4.875)	N-5585 (01/01VO)
17" wheel/brakes	Standard ratio	Standard Ratio (4.5)	A-5585
17" wheel/brakes	Hewland dog-typeVariant Option	(4.3)	N-5585 (Part VO)

3. The following gear ratios have been homologated for the Evo.7 under FIA Group N regulations:

<b>Car Spec.</b>	<b>Ratio Set</b>	<b>Final Drive</b>	<b>Homologation</b>
17" wheel/brakes	RS-2 Std.	Brembo Ratio(4.5)	Base
15" wheel/brakes	RS Std.	Hi-Cross Ratio (4.5)	VO (as E6)
15"or17"wheel/brakes (Also front mechanical LSD and Titanium Turbo).	Hewland dog-typeVariant Option	(4.3)	Part VO

# Mitsubishi Lancer Evolution Transmission & Differential Information

## Group N homologation data, Important notes, especially for Evolution 6 & 7 cont.

4. The twin plate clutch is expressly forbidden, even the Mitsubishi standard original equipment version.
5. The Evo. 6 cannot adopt 2 x cooling fans on the radiator. One standard pull fan is permitted only.
6. Evo. 6 must use the Evo. 6 engine perfectly, so pay attention to:
  - a) Turbocharger (TD05HRA) Ti-Al Alloys turbine
  - b) Thermostat case
  - c) Intercooler
  - d) Pistons
7. Maximum wheel size for E6 with 15" brakes is 6.5 x 15"
8. Evo. 7 is only to be homologated with the Active Centre Differential (not VCU option).
9. Evo. 7 with 15" brakes can use any wheel upto a maximum of 8.0 x 17"

## Turbocharger Assy identification information

Model	Part No.	Remarks
EVO5 RS	MR431439	
EVO5 GSR	MR431439	
EVO6 RS	MR497077	Titanium T/C Big Compressor
EVO6 GSR	MR481451	Inconel T/C (not for Group N)
EVO6 T/M RS	MR497077	Titanium T/C Big Compressor
EVO6 T/M GSR	MR552116	Hi-Response Titanium T/C (not for Group N)

## Special road car conversions

We now have available a mechanical LSD assy which can be installed in the AYC rear differential assy of the Evolution 4 -7.

So if you have any problems with your AYC system you can transform it to mechanical operation. A must for reliable regular track day use!

## Evolution 7/8 Active Centre Diff - Special ECU

Ralliart has developed special ECU's for the Evo.7's Active centre Diff, for Gravel and Tarmac specifications.

Co-ordSport can also offer the GEMS adjustable ACD ECU, programmed by our technical partners, MEM. This is the same as used on the successful TEAM MITSUBISHI MOTORSPORTS AMERICA open class cars in the SCCA Pro Rally series.( cars built by MEM, run by Vermont Sports Car)

# Mitsubishi Lancer Evolution Transmission & Differential Information

## Evo 6 Ralliart Plate Grp N Limited Slip Differential Unit - Side Gear Installation

Please note that the Ralliart plate type front limited slip differential unit has different circlip groove positions on each side as per the photograph below. The gears must be installed correctly.



It is also important to install the pressure rings the correct way around, otherwise the differential will lock on over-run (this has happened for one customer).