

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

The **Mitsubishi Lancer Evolutions IV, V, VI, T.M.Edition, VII, VIII, 8MR & IX** have various 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 were 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	1.950
3	38/27	1.407
4	33/32	1.031
5	32/42	0.761
R	26/12 x 41/26	3.416
Constant	xxxx	xxxx

Gear		Ratio
1	39/14	2.785
2	39/20	1.950
3	39/27	1.444
4	34/31	1.096
5	33/40	0.825
R	26/12 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
Ratio	4.529	3.323	3.307
No. of teeth	77/17	53/16	43/13

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

The above three items were allowed 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 dept.

### **Competition Differentials:**

Co-ordSport has been able to supply a variety of special differentials, including the following:

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

This offers a mechanical plated type Front Limited Slip Differential, together with an uprated 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 uprated 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 uprated 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 – New Versions (RA763555N3/RA580103S1)**

In line with the new regulations Ralliart Inc. has homologated a new 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 - Evo1-10**

KAAZ Corp. is a Japanese Company, which manufactures LSD units for a range of Japanese & European makes and models of car. For the Evolution Lancers 1 - 10 they produce mechanical, plated Limited Slip Differential units, which replace the Front, Centre & Rear Differentials (but only rear of Evo7-10). KAAZ also produce 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 or ActiveCentreDiff for FIA Group N.

For Group A and Open Regulations 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 LSD is big, so VCU has to be removed). Co-ordSport also has available such as an uprated output shaft made from better material and with improved heat treatment finish.

#### **D. Cusco Front, Centre & Rear Limited Slip Differentials**

The LSD's produced by Cusco are similar to the KAAZ items, but they are not legal for Group N use and can only be used within Group A or Open Regulations.

## **5 Speed Competition Transmissions:**

Co-ordSport recommends the HKS, KAPS or Ricardo dog-type transmission gearsets with 5 speeds. These utilise a standard gearbox casing & mate 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 kit requires installing by a professional technician. Sequential gear change systems are also available, plus 6 speed non-homologated gear sets.

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 Ralliart homologated version.

### **Evo.4-9 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	1.950
3	39/27	1.444
4	34/31	1.096
5	33/40	0.825
R	26/12 x 41/26	3.416
Constant	Xxxx	xxxx

Homologated (Grp.N) ratios:  
Ratio Set No.2 (w/4.307/4.2~4.142)

<b>Gear</b>	<b>Teeth</b>	<b>Ratio</b>
1	36/12	3.000
2	26/13	2.000
3	25/17	1.470
4	20/18	1.111
5	24/28	0.857
R	26/12 x 41/26	3.416
Constant	xxxx	Xxxx

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	1.950
3	33/20	1.650
4	30/22	1.363
5	34/31	1.096
R	26/12 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), 4.142(58/14), 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.

### **Special Notes**

It is still ideal to use the clutch when changing gear with the dog kit ratio set No. 1. This type of gear kit can require more maintenance than a standard gearbox.

More details available in Assembly Manual at <http://www.coordsport.com/TechnicalFAQ.html>

Ralliart Inc. 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	3.000
2	26/13	2.000
3	25/17	1.470
4	20/18	1.111
5	24/28	0.857
R	26/12 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)

This is homologated for the Evo's 5 & 6 (CP9A) and later for the Evolutions 7-9 in Group N.

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

Ralliart Inc. used 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	3.250
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).

## **Evolution VII**

The Evolution VII was homologated effective 01<sup>st</sup> April(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	1.950
3	38/27	1.407
4	33/32	1.031
5	31/43	0.720
R	26/12 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	1.950
3	38/27	1.407
4	33/32	1.031
5	31/43	0.720
R	26/12 x 41/26	3.416
Constant	xxxx	xxxx

RS Model Hi-cross/15" (variant option)

<b>Gear</b>	<b>Teeth</b>	<b>Ratio</b>
1	39/14	2.785
2	39/20	1.950
3	39/27	1.444
4	34/31	1.096
5	33/40	0.825
R	26/12 x 41/26	3.416
Constant	xxxx	xxxx

Evo 7 RS Box [MR953346](#)

<b>Speed</b>	<b>Gear Ratio</b>
1 <sup>a</sup>	2,785=39/14
2 <sup>a</sup>	1,950=39/20
3 <sup>a</sup>	1,444=39/27
4 <sup>a</sup>	1,096=34/31
5 <sup>a</sup>	0,825=33/40

<b>Final Drive</b>
4,529=77/17

### **B. Front Differential**

Telephone: 0121 661 6263

Fax: 0121 557 1969

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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 were available with 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.

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.

### D. Final drive ratios

GSR Model

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

RS Model

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

## EVOLUTION 8 + 8MR

The Evolution \* saw the introduction of an all new 6 speed transmission. The standard ratios are as follows:

Gear	Teeth	Ratio
1	32/11	2.909
2	35/18	1.944
3	33/23	1.434
4	33/30	1.100
5	33/38	0.868
6	34/49	0.693
R	29/11 x 38/37	2.707
Constant	xxxx	xxxx

This works with the following final drive ratio:

	Front	Rear
Ratio	4.583	3.307
No. of Teeth	55/12	43/13



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 (Carisma GT), TME, VII, VIII+MR, IX**. 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)

### Additional Information:

GEAR RATIOS	SET A	SET B	SET C	SET D	SET E
1st	2.785	2.785	2.928	2.785	3.000
2nd	1.950	1.950	1.95	1.95	2.000
3rd	1.407	1.444	1.407	1.407	1.470
4th	1.031	1.096	1.031	1.031	1.111
5th	0.761	0.825	0.72	0.72	0.857

#### 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-????	?	?	?



Evo 7

PART NUMBER	CODE	RATIOS	FINAL DRIVE RATIO	SPEED DRIVE GEAR
MR953341	W5M51-2-X5B	C(GSR)	4.529	28/36
MR953342	W5M51-2-X5B1	D(RS)	4.529	28/36
MR953343	W5M51-2-X5B2	B(RS)	4.529	28/36
MR953345	W5M51-2-X5B3	D(RS-2,ABS)	4.529	28/36
MR953346	W5M51-2-X5B4	B(RS T7P)	4.529	28/36
RA55345S1	?	E	4.307	?

Evo 8

PART NUMBER	CODE	RATIOS	FINAL DRIVE RATIO	SPEED DRIVE GEAR
MN132225	W6MAA-1-6FNF			
MN132375	W5M51-2-X5BA			
MN168658 (USspec.)	W5M51-2-X5BC			

## 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	Production stopped (E6)
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/E8 (ACD + LSD)
MR980932	E8 (5+6speed, RS+GSR)
3200A011	E7/8 GSR
3200A058	E8/9 GSR 6 speed

## 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	RS
MR580745	GSR AYC

### **E9**

3501A002	RS / GT
MN168836	GSR AYC

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

- Limited Slip Differentials are allowed at the front and rear of the Evolution 4 - 7 Lancer, provided they are the homologated versions.
- The following gear ratios are permitted for an Evo. 6 under FIA Group N regulations, from 01/01/01 (E6 FIA homologation expires end of 2005)

Car spec.	Ratio Set	Final Drive	Homologation
15" wheel/brakes	Super-Cross ratio	Standard Ratio (4.5)	N-5585(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-type	Variant Option (4.3)	N-5585 (Part VO)

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

Car Spec.	Ratio Set	Final Drive	Homologation
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-type	Variant Option (4.3)	Part VO

- The twin plate clutch is expressly forbidden, even the Mitsubishi standard original equipment version.
- The Evo. 6 cannot adopt 2 x cooling fans on the radiator. One standard pull fan is permitted only.
- Evo. 6 must use the Evo. 6 engine perfectly, so pay attention to:
  - Turbocharger (TD05HRA)      Ti-Al Alloys turbine
  - Thermostat case
  - Intercooler
  - Pistons
- Evo. 7 is only to be homologated with the Active Centre Differential (not VCU option).

## 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 Grp. N)
EVO6 T/M RS	MR497077	Titanium T/C Big Compressor
EVO6 T/M GSR	MR552116	Hi-Response Titanium T/C (Not for Grp. N)

## Special road car conversions

We now have available mechanical LSD's which can be installed in the AYC rear differential assy of the Evolution 4-8, manufactured by Cusco.

So if you have any problems with your AYC system you can transform it to mechanical operation. Or just to tighten up your AYC's rear end. A must for reliable regular track day use!

## Evolution 7 Active Centre Diff - Special ECU

Ralliart has developed special ECU's for the Evo.7 + 8's Active centre Diff, for Gravel and Tarmac specifications (tarmac version is ideal option for street/track use).

## 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).

## Evo 8 Ralliart Plate Grp. N Limited Slip Differentials

The front LSD homologated for the Evolution 8 +MR by Ralliart, which has made more plates than the Evo 7, has suffered from weak side gears. There are plans to improve the quality of these components. New spec. should be available Spring 2005. Whilst some companies will also have available specially manufactured replacement gears also.

### TRANSFER BOX INTERNAL PARTS INFO

#### Evo IV/VI Transfer Assy

<u>PNC</u>	<u>DESCRIPTION</u>	<u>PART No.</u>
30096	Nut T/F	MD748003
30454	Bearing	MD746745
30086T	Spacer	MD747961-91
30307	Bearing	MD746744
300865	Spacer	MD749806-19
30276	Gear set	MD749696
30416	Thrust Washer	MD748089
30434	Spacer set	MD722982-6
30087	O Ring	MD744201
30086P	Spacer	MD746954-81
30086Q	Spacer	MD743915-50
30428	Bearing	MD746743
30429	Bearing	MD728354
30420	Case T/F Diff	MD747952
30470A	LSD	MD748756 (MD770939) (MR498830)
30431	Coupling Unit Viscous	MD747902
30433	Gear kit, Diff.	MD749174
30091	Washer T/F	MA145188
30099	Bolt, T/F (10 required)	MD751870 (Flange, 10x25)

#### EVO VII/VIII.

30096	Nut T/F	MD748003
30454	Bearing, Pinion	MR980813
30086T	Spacer	MD747961-91
30307	Bearing, Rear	MR553235
300865	Spacer	MD746934-950 MD744879-80 MD744113 MD744881-84 MD744396 MD743915-17

30276	Gear set	3219A002
30416	Thrust Washer	MD748089
30434	Spacer set	MD722982-6
30087	O Ring	MD744201
30086P	Spacer	MD746954-81
30086Q	Spacer	MD743915-50
30428	Bearing	MR145926
30429	Bearing	MR980099
30420	Case T/F Diff	
30470A	LSD	
	ACD Unit	
30091	Washer T/F	MA145188
30099	Bolt, T/F	MD751870
	(10 required)	(Flange, 10x25)

### **TRANSFER OVERHAUL KITS**

<b><u>RA748267S1</u></b>		<b>(EVO IV/VI)</b>	<b><u>available separately ?</u></b>
MD746743	x 1	Bearing	Y
MD728354	x 1	Bearing	Y
MD743612	x 1	O-Ring	Y
MD748089	x 2	Thrust Washer	Y
MD727944	x 1	O-Ring	Y
MD752659	x 1	O-Ring	Y
MD745423	x 1	Oil Seal	Y
MD747546	x 1	Oil Seal	Y
MD755526	x 1	Oil Seal	Y

### **RA748267S2**      **TBA**

<b><u>RA580073S1</u></b>		<b>(EVO VII)</b>	<b><u>available separately ?</u></b>
MD743612	x 2	O-Ring T/F	Y
RA771161K1	x 1	O-Ring	Y
MD727944	x 1	O-Ring T/F	Y
MR580002	x 1	O-Ring	?
MD752659	x 1	O-Ring T/F	Y
MD748089	x 2	Thrust Washer	Y
MD755526	x 1	Oil Seal T/F Case	Y
MD745423	x 1	Oil Seal T/F	Y
MD771729	x 1	Bearing M/T	Y
		(HTF R65-11g, ID65mm OD91mm)	
MR145926	x 1	Bearing T/F ACD	?
		(HR32012 xj, ID60mm OD95mm)	

**RA980932S1****(EVO VIII + 8MR)**available separate

MR980099	x 1	Bearing (NTF R67-4g, ID67mm OD90mm)	Y
MR145926	x 1	Bearing (HR32012XJ, ID60mm OD95mm)	?
MD755526	x 1	Oil Seal	Y
MD743612	x 2	O-Ring	Y
MR980100	x 1	Oil Seal	?
MD752629	x 1	O-Ring	Y
RA771161K1	x 1	O-Ring	Y
MD727944	x 1	O-Ring	Y
MR580002	x 1	O-Ring	?

### Evo VIII EGR / Throttle Body homologation

VEHICLE	HOMOLOGATED MODEL	EGR FITTED	No. of vacuum pipes on Throttle boddy	Use Throttle Body Kit ?
Evo VIII RS domestic	√	No	1	No
Evo VIII RS export	X	Yes	3	Yes
Evo VIII MR GSR	√	No	1	No
Evo VIII MR RS export('05model)	X	Yes	3	Yes

### Throttle Body Kit:

Description	PNC	Part Number	Quantity	
Cover	11406	MD103510	01	
Gasket	12410	MD183536	01	
Bolt, washer	11498X	MF240051	02	
Hose assy	12413AS	1632A005	01	
Pipe & hose	12433A	1632A017	01	
Gasket	07710	MD180361	01	
Body assy, throttle	07700A	MN143501	01	
Bolt, washer	07798	MF241264	04	