
SECTION 2

POWER TRAIN

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Manual Transmission

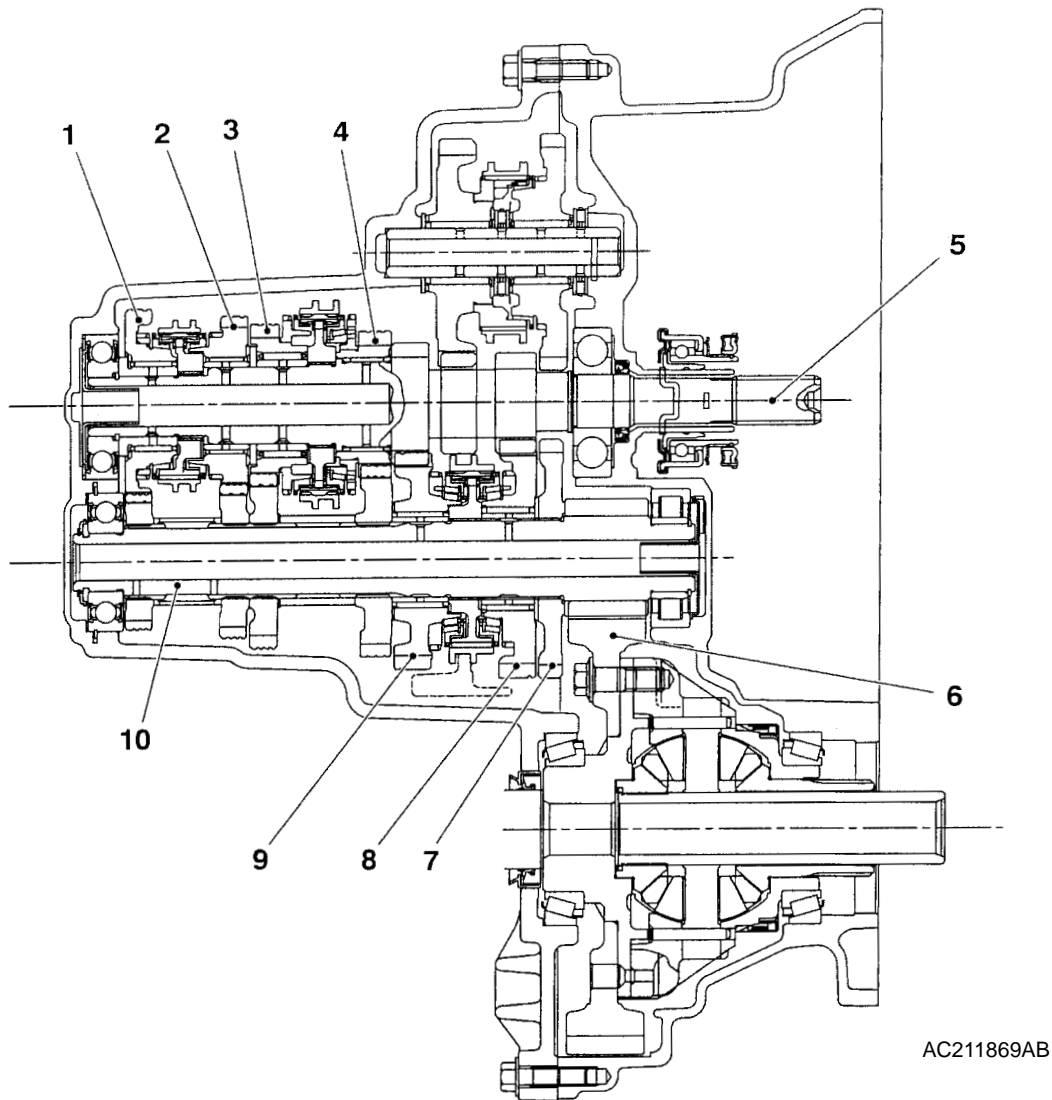
General Information

- In accordance with the new additions to the Lancer Evolution-VIII, both the newly developed 6-speed transmission (W6MAA type) and the original 5-speed transmission (W5M51 type) can be installed.
- The W6MAA type transmission (6-speed manual gearbox) is mounted in the GSR, and the W5M51 type (5-speed manual gearbox) transmission and the W6MAA type transmission (6-speed manual gearbox) are mounted in the RS.
- The W6MAA type transmission (6-speed manual gearbox) enhances acceleration and high-speed performance by using a 6-speed close ratio gearbox, and can handle a wide range of driving conditions.
- The W5M51 type transmission (5-speed manual gearbox) is basically the same as the super-close-ratio specification mounted on the original Lancer Evolution-VII (RS).
- As well as 5- and 6-speed manual gearbox options, The transmission includes Active Centre Differential (ACD) and helical gear LSD as standard equipment.

Specifications

Items		Specifications			
Classification		New		Old	
		GSR/RS	RS	GSR	RS (super-close gear)
Transmission type		W6MAA	W5M51	←	←
Engine type		4G63-DOHC-T/C	←	←	←
Transmission type		6 steps forward, 1 step reverse, always in contact	6 steps forward, 1 step reverse, always in contact	←	←
Gear ratios	1 st	2.909	2.785	2.928	2.785
	2 nd	1.944	1.950	←	←
	3 rd	1.434	1.444	1.407	1.444
	4 th	1.100	1.096	1.031	1.096
	5 th	0.868	0.825	0.720	0.825
	6 th	0.693	-	←	←
Reverse		2.707	3.416	←	←
Final reduction gear		4.583	4.529	←	←
Helical gear LSD (front differential)		No	←	←	←
Transfer	Reduction Gear	3,307	←	←	←
	Limited slip differential	Hydraulic multiplate clutch (ACD)	←	←	VCU or Hydraulic multiplate clutch (ACD)

Sectional view
W6MAA (6-speed manual transmission)



- 1. 6th gear
- 2. 5th gear
- 3. 4th gear
- 4. 3rd gear
- 5. Input shaft

- 6. Final gear
- 7. Reverse gear
- 8. 1st gear
- 9. 2nd gear
- 10. Output shaft (main shaft)

Description of structure and operations (6-speed manual transmission)

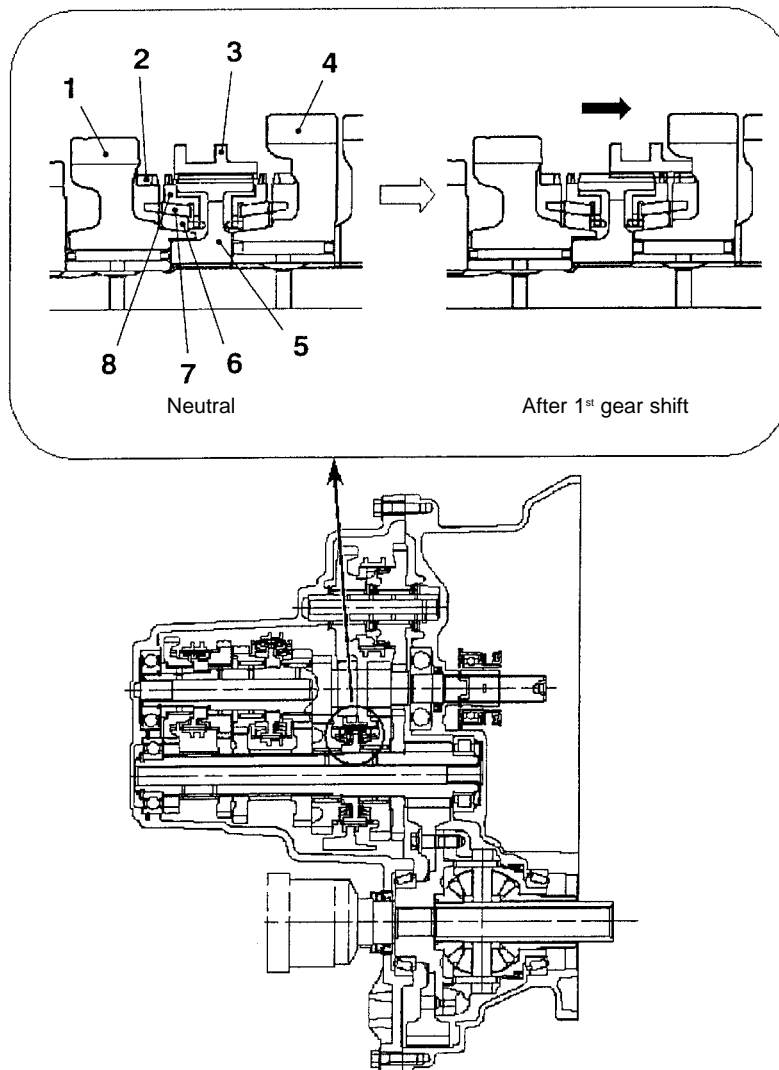
1. Synchromesh

- Triple-cone synchronisers are adopted on the 1st and 2nd gears. The gear change feels smooth and lighter.
- Reverse gear now has synchromesh, so that reverse can be engaged more smoothly and quietly.

1-1 Triple-cone synchromesh

The purpose of the triple-cone synchromesh is to enable smooth gear changes by spreading the cone friction across three surfaces on the same axis. The outer synchroniser ring and inner synchroniser ring have respectively been positioned outside and inside the synchroniser cone.

Because the interior of the inner synchroniser ring is also used as a friction surface, a much better system is achieved compared to the double-cone system.



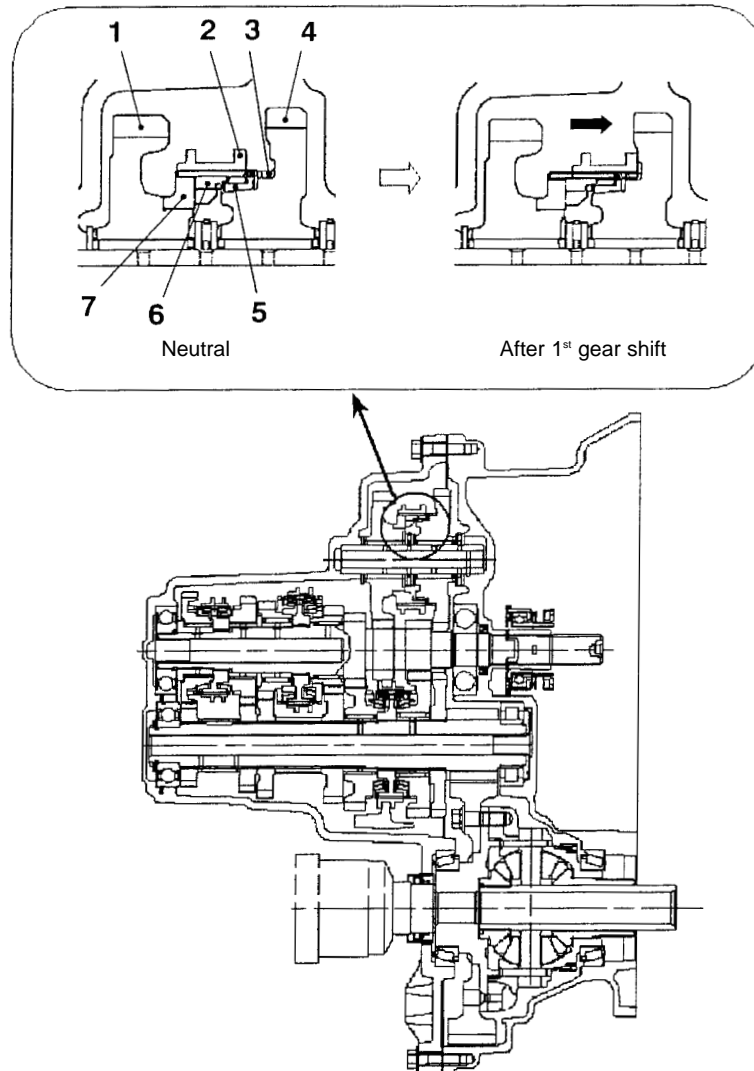
1. 2nd gear
2. Clutch
3. Coupling sleeve
4. 1st gear

5. Synchroniser hub
6. Inner synchroniser ring
7. Synchroniser cone
8. Outer synchroniser ring

1-2 Reverse synchronesh

A synchroniser hub, coupling sleeve, synchroniser ring and insert spring installed on the reverse idle gear, has created a much smoother reverse gear change.

This prevents abnormal grating noises and vibration that can arise when changing rapidly into reverse or when changing into reverse while the engine revolutions are too high.



- 1. Rear reverse idler gear
- 2. Coupling sleeve
- 3. Clutch
- 4. Front reverse idler gear

- 5. Reverse synchroniser ring
- 6. Insert spring
- 7. Synchroniser hub

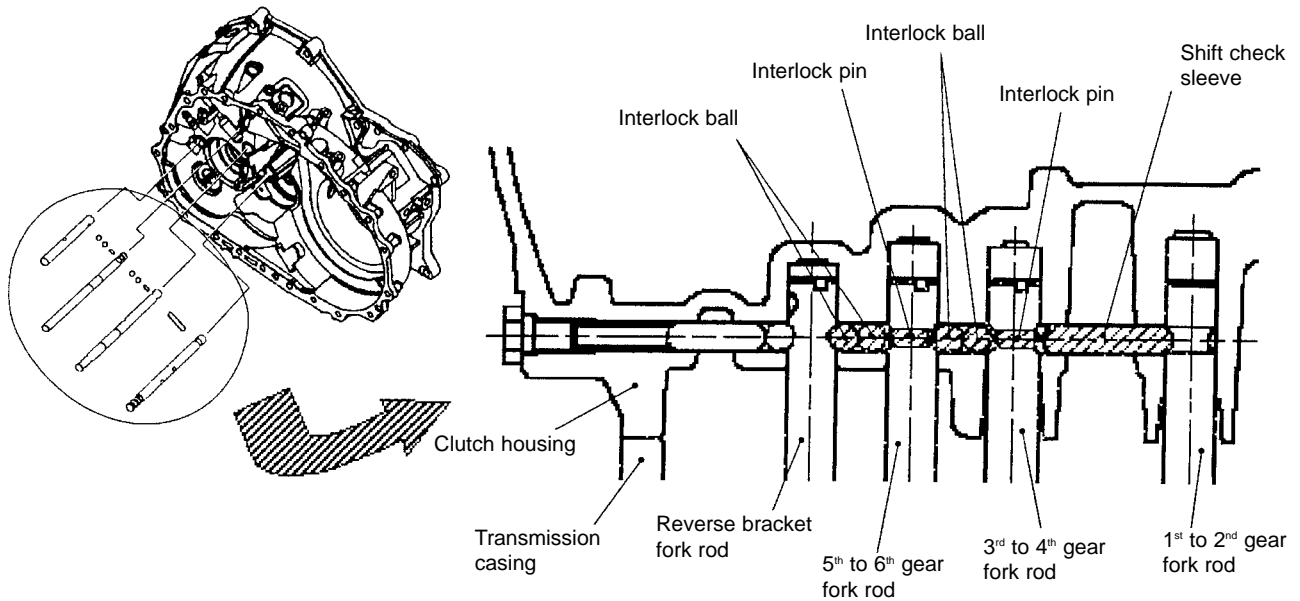
2. Mechanism to stop two gears being engaged at once.

This mechanism prevents engaging two gears at the same time, and is based on the selector forks which are not being used to change a gear being locked in neutral by a shift check sleeve and interlock ball.

Operation

(When in neutral)

With the operation of the mechanism, the shift check sleeve, interlock pin and interlock ball are free when in neutral. In this case, any gear (1st to 2nd, 3rd to 4th, 5th to 6th, and reverse) can be engaged.



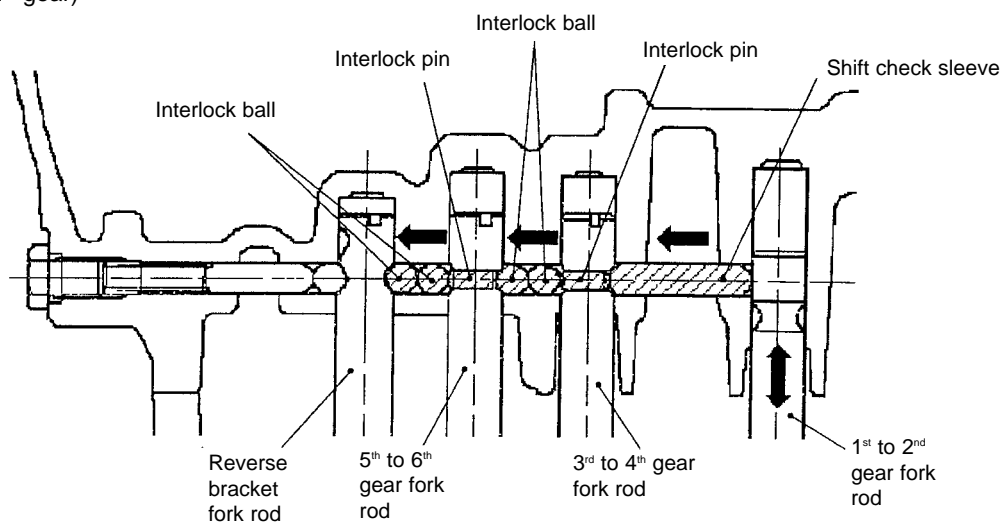
(When changing gear)

When the 1st/2nd gear fork rod moves to engage 1st or 2nd gear, the shift check sleeve is pushed against the 3rd/4th gear fork rod and the position of the 3rd/4th gear fork rod is locked when the shift check sleeve engages the grooves of the fork rod.

Also, being pushed by the shift check sleeve, the interlock pin in the 3rd/4th gear fork rod, their two interlock balls, the interlock pin in the 5th/6th gear fork rod and their two interlock balls, all move. The positions of the 5th/6th gear selector fork and the reverse gear selector fork are locked by the interlock balls engaging the grooves of each fork rod.

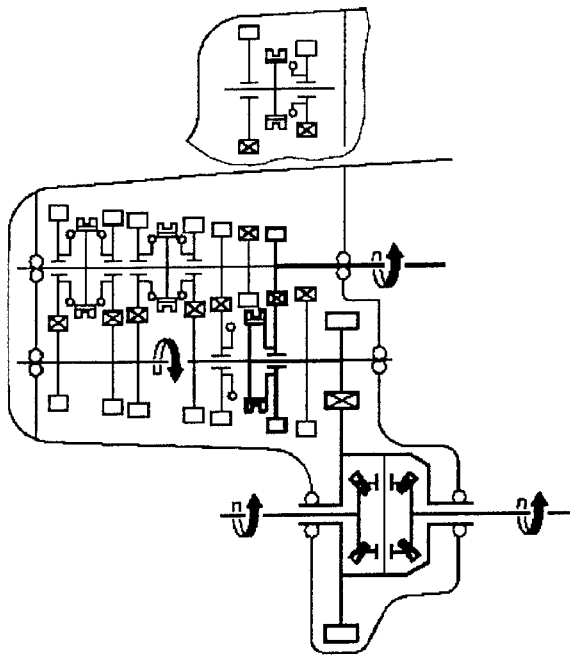
The system works for any gear change by locking, with the shift check sleeve and the interlock balls, those selector forks that are not being used to change a gear.

(Example: 1st/2nd gear)

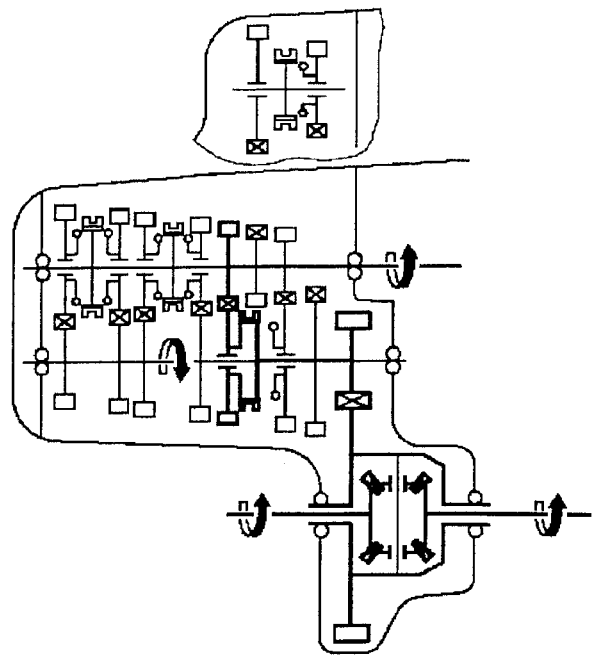


3. Power flow

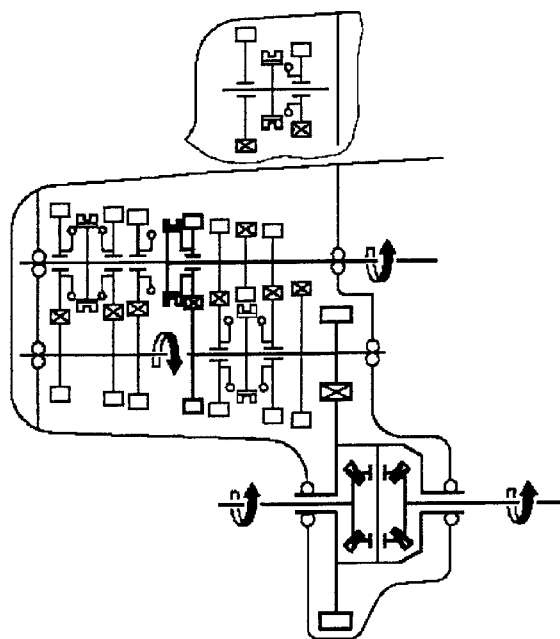
1st gear



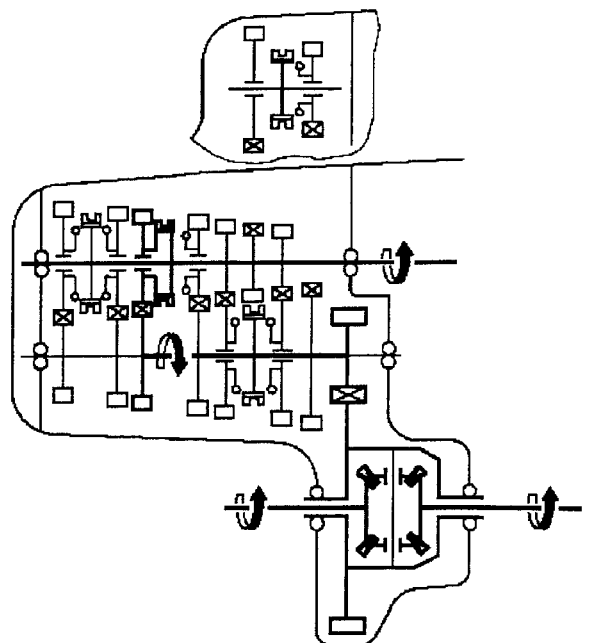
2nd gear

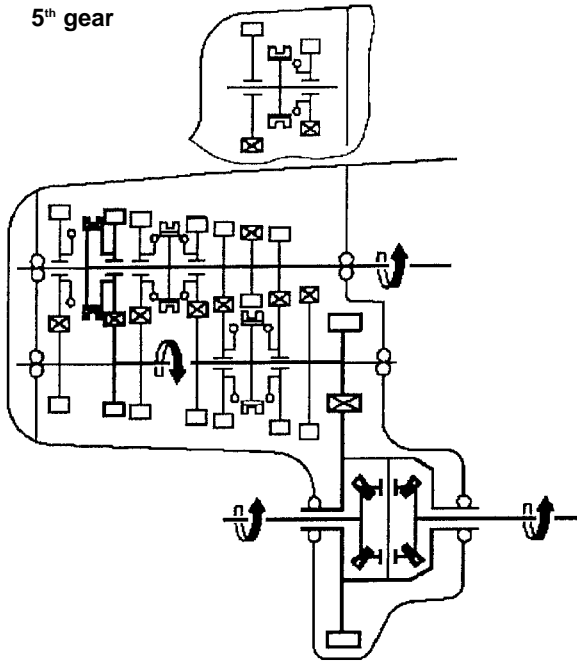
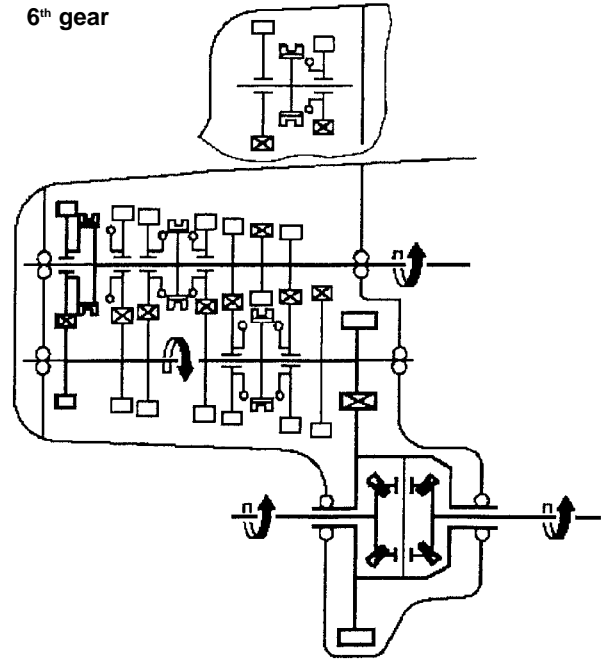


3rd gear

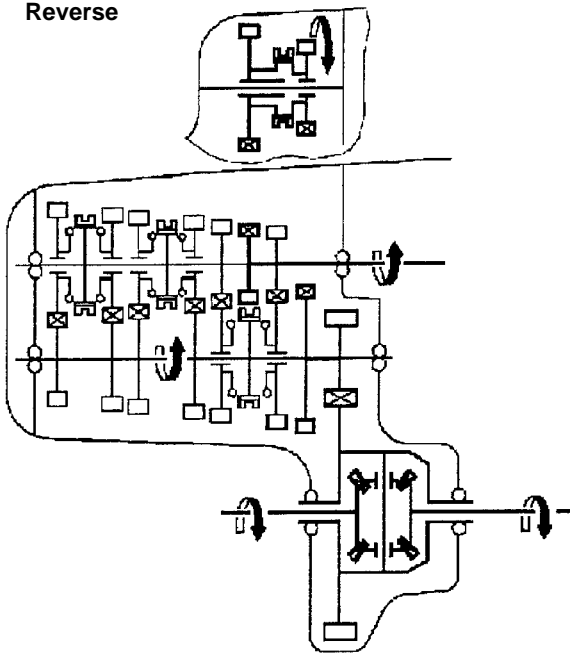


4th gear

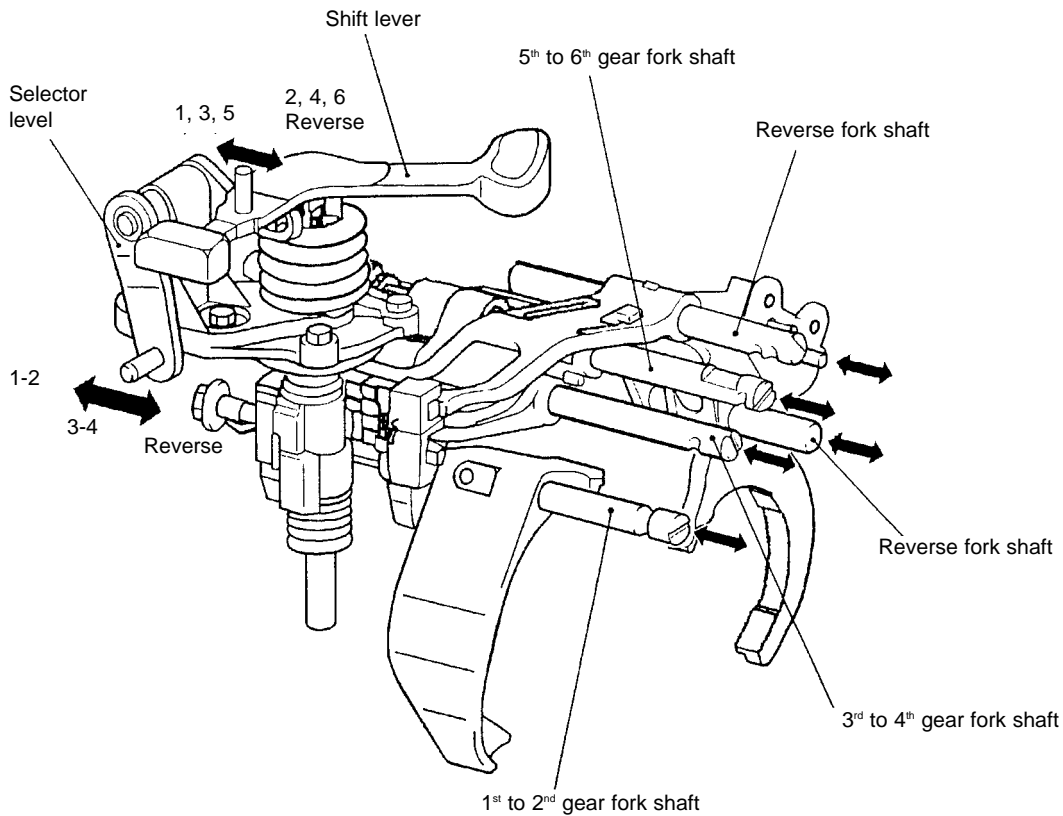


5th gear6th gear

Reverse



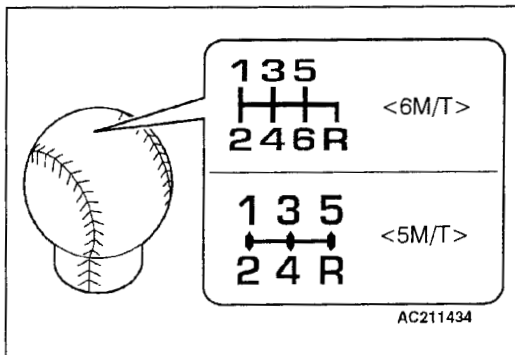
4. Shift lever



Transmission control

This is basically the same as for the original Lancer Evolution-VII, but the following changes have been made:

- A spherical gear knob is adopted only for the Lancer Evolution-VIII.
- A 6-speed gear lever assembly is adopted with the addition of 6-speed transmission (basically the same as for the original Lancer Evolution-VII in the case of 5-speed transmission)
- A system is adopted on the 6-speed gear lever assembly to prevent the accidental engagement of reverse gear.

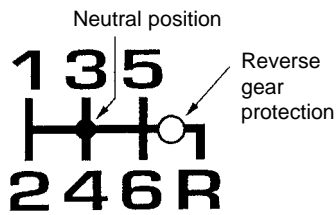


Gear knob

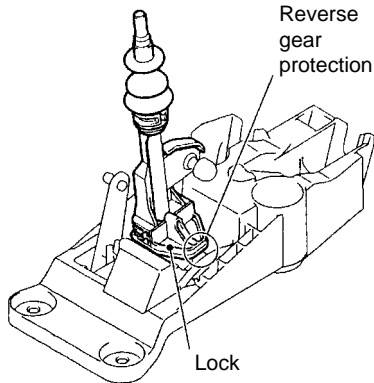
A spherical leather gear knob has been adopted.

The size of this gear knob takes into consideration the fact that racing gloves may be worn, and its shape allows maximum control. Its soft feel and leather finish protects the hand in competitive events such as endurance races.

6M/T Shift pattern



6M/T Shift lever assembly



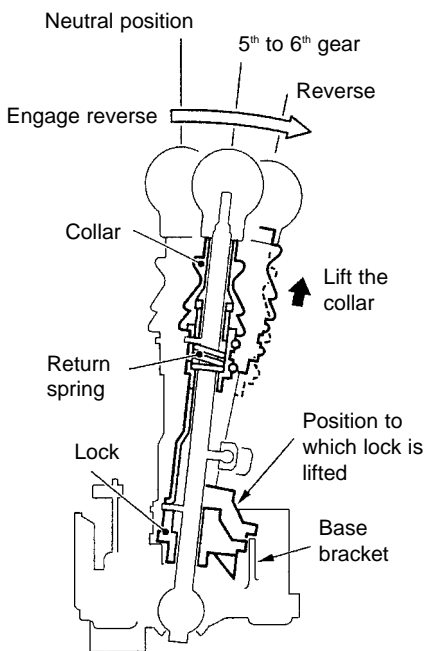
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Gear lever assembly (6 M/T)

The 6-speed gear lever assembly has a 6th gear position in the reverse position of the 5-speed shift lever assembly, and the reverse gear is located further to the right. A mechanism has been added to prevent reverse gear being engaged when changing from 5th to 6th gear. The change into 6th gear is made in the same way as a change into 5th and because of the revised gear selection mechanism, the change into these gears is now more positive.

Operating the Reverse Gear Protection mechanism

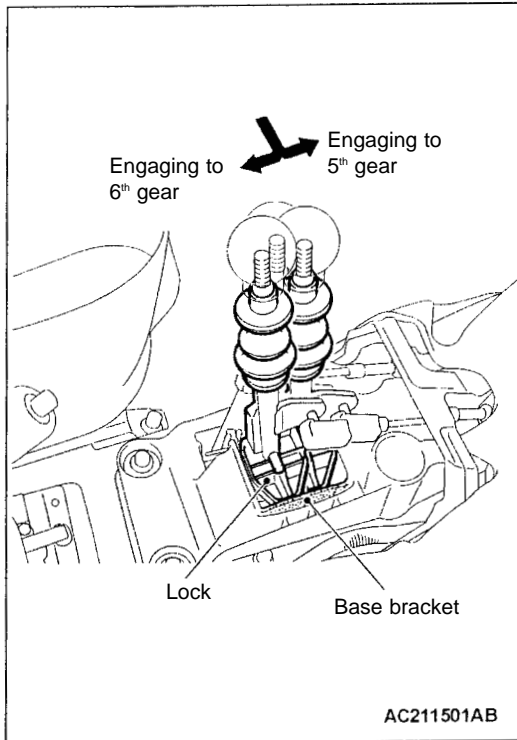
The Reverse Gear Protection mechanism is mounted on the gear lever, and comprises a collar, lock and return spring. In normal operation, the lock touches the base bracket so that changing into reverse is impossible. When it is necessary to change into reverse, the collar under the gear knob is lifted, pulling up the lock and the gear lever is released.



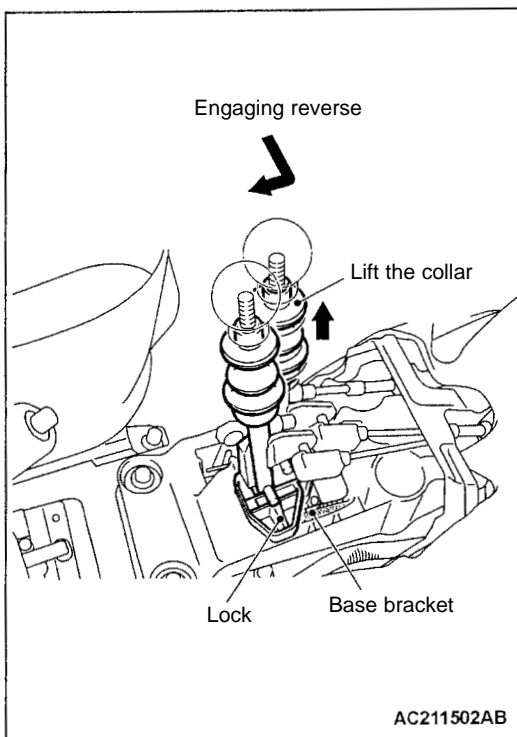
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Reverse Gear protection when changing into 5th or 6th gear

The lock moves against the base bracket when shifting to 5th or 6th gear, thus preventing a change into reverse.

**When engaging reverse**

Reverse can be engaged by pulling up the collar beneath the gear knob



Active Centre Differential (ACD) and Active Yaw Control (AYC)

General information

- The following has been changed with the new additions to the Lancer Evolution-VIII.
- Super AYC has been adopted in the rear differential (refer to P. 2-14).
 - Only one position in line with the adoption of Super AYC.

Electronic control system

4WD-ECU

1	2	3	4	5	6	7	8	9	10	11	12	13	31	32	33	34	35	36	37	38	39	40	41
14	15	16	17	18	19	20	21	22	23	24	25	26	42	43	44	45	46	47	48	49	50	51	52

Y2121AU

The 4WD-ECU ABS monitor terminal No. 49 has changed to No. 48 in line with the adoption of Super AYC. Other terminal numbers are the same as for the Lancer Evolution-VII. However, if the 4WD-ECU for the Lancer Evolution-VII is mounted in the Lancer Evolution-VIII, it becomes AYC control defect, and Diagnosis Code No. 65 appears 60 seconds after Ignition is switched ON and the ACD and AYC systems stop. (the same applies if the 4WD-ECU for the Lancer Evolution-VIII is mounted in the Lancer Evolution-VII)

Propeller Shaft

The specifications of the propeller shaft have changed as follows for the 6M/T mounting.

Specifications

Item		New 6M/T	New and old 5M/T
Universal joint	Journal diameter mm	18.3	16.3

Front Axle

EBJ has been adopted in the drive shaft wheel constant velocity joints.

Specifications

Item			New	Old
Drive shaft	Joint type	Wheel	EBJ ^{*1}	BJ
		Transmission	TJ	←
	Shaft length ^{*2} x Shaft diameter mm	LH	352.5 x 26	350 x 26
		RH	429.5 x 26	427 x 26

Notes

*1: EBJ: by adopting 8 reduced diameter balls, the velocity joints weigh less and are more compact than the original BJ

*2: The location of the central point of each joint is shown.

Rear Axle

EBJ has been adopted in the drive shaft wheel constant velocity joints.

Specifications

Item			New		Old	
			AYC not mounted	AYC mounted	AYC not mounted	AYC mounted
Drive shaft	Joint type	Wheel	EBJ ^{*1}	←	BJ	←
		Trans-mission	TJ	←	TJ	←
	Shaft length ^{*2} x Shaft diameter mm	LH	485.6 x 25	428.5 x 25	483 x 25	426 x 25
		RH	575.5 x 25	448.5 x 25	573 x 25	446 x 25

Notes

*1: EBJ: by adopting 8 reduced diameter balls, the velocity joints weigh less and are more compact than the original BJ

*2: The location of the central point of each joint is shown.

Differential

The differential has changed as follows.

- Optimisation and weight saving of the differential carrier wall thickness (RS)
- Installation of super AYC (standard for GSR; optional for RS)

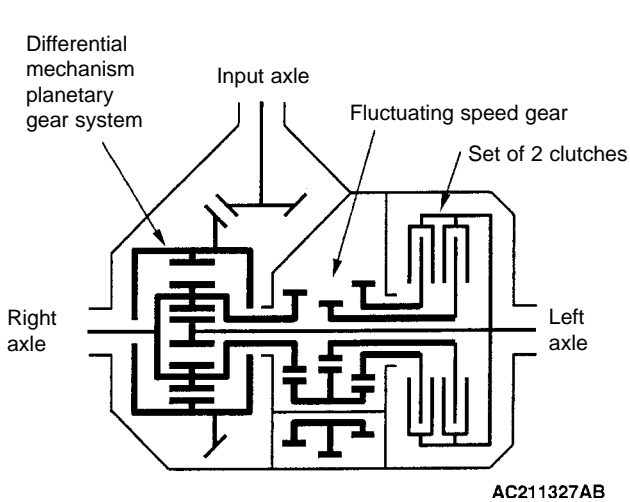
Super AYC

The performance in track competitions such as rally cross and circuit races has improved significantly with AYC, where the torque differential has increased by 1.6 compared to the original by changing the design of the AYC torque transfer differential. It has the following features.

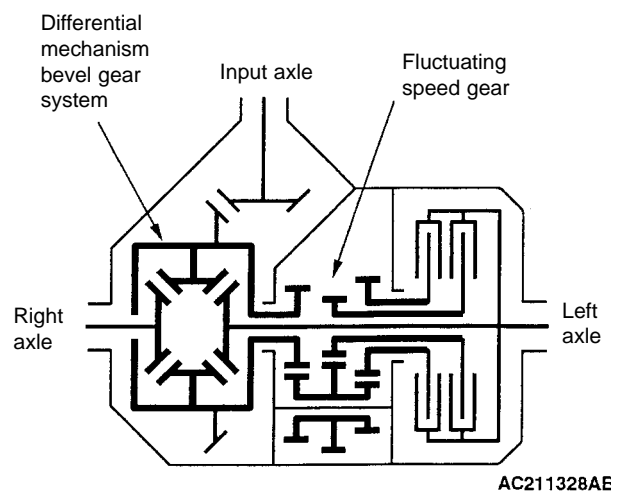
- Turning characteristics: The yaw has increased because of the increased torque differential between the right and left wheels. The turn-in has improved further and understeer is reduced.
- Traction performance: Improved performance (LSD effect) on a wide range of road conditions
- The original case-to-shaft system (system of transmitting torque between the differential case and the right axle) has been changed to a shaft-to-shaft system in order to increase the amount of torque movement.
- The differential mechanism has changed from bevel gear to a planetary gear type in order to operate the shaft-to-shaft system.

Construction Diagram

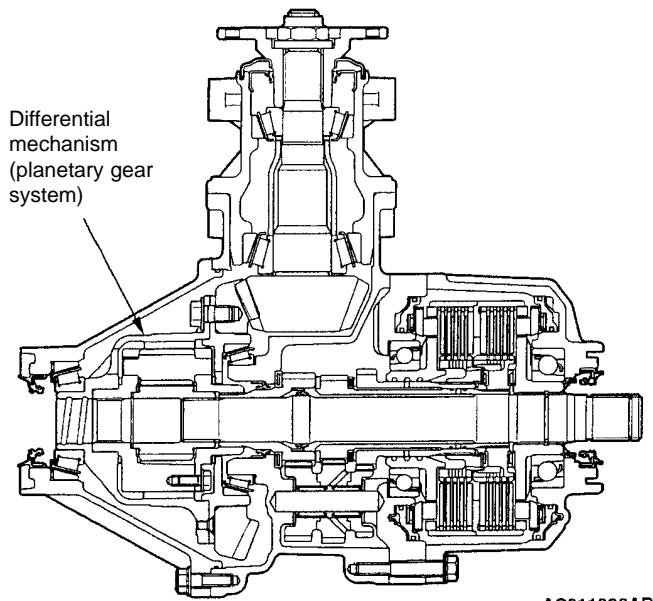
New: Super AYC (shaft-to-shaft system)



Old: AYC (case-to-shaft system)

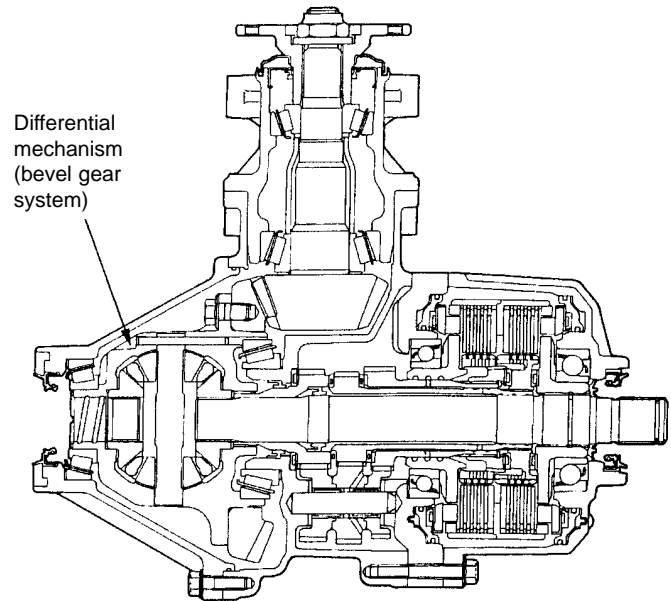


New: Super AYC (Shaft to shaft system)



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Old: AYC (Case to shaft system)



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