



Technical Service Information

GENERAL MOTORS SIX & EIGHT SPEED MISSING GEAR DIAGNOSIS

COMPLAINT: When a GM six or eight speed transmission develops a solenoid malfunction, it is difficult for the technician to determine which gears will be affected.

CAUSE: A mechanical solenoid failure or a malfunction of the solenoid's corresponding regulator valve or failure of a clutch to apply.

CORRECTION: The cause and effect of a mechanical solenoid, regulating valve or clutch pack malfunction can be seen in the chart in figure 1 for the 6T40 Series of transmissions.

The cause and effect of a mechanical solenoid, regulating valve or clutch pack malfunction can be seen in the chart in figure 2 for the 6T70 Series of transmissions.

The cause and effect of a mechanical solenoid, regulating valve or clutch pack malfunction can be seen in the chart in figure 3 for the 6L50, 80 and 90 Series of transmissions.

The cause and effect of a mechanical solenoid, regulating valve or clutch pack malfunction can be seen in the chart in figure 4 for the 8L45/90 Series of transmissions.



Technical Service Information

6T40 MISSING GEAR DIAGNOSIS

COLUMN NUMBER								1	2	3	4	5	6
RANGE	GEAR	RATIO	SHIFT SOL (On/Off)	1-2-3-4CL PC SOL 5 N.L.	2-6 CL PC SOL 4 N.L.	3-5 REV CL PC SOL 2 N.H.	LO/REV 4-5-6 CL PC SOL 3 N.H.	4-5-6 CLUTCH	3-5 REV CLUTCH	2-6 CLUTCH	LOW ONE-WAY CLUTCH	LO/REV CLUTCH	1-2-3-4 CLUTCH
PARK	P		ON	OFF	OFF	ON	OFF					APPLIED*	
REV	R	2.940	ON	OFF	OFF	OFF	OFF		APPLIED			APPLIED	
NEUT	N		ON	OFF	OFF	ON	OFF					APPLIED*	
Neutral Stop Capable ← (Next Page) D R I V E	1ST BRAKING	4.584	OFF	ON	OFF	ON	OFF					APPLIED	APPLIED
	1ST	4.584	OFF	ON	OFF	ON	ON				HOLD		APPLIED
	2ND	2.964	OFF	ON	ON	ON	ON			APPLIED			APPLIED
	3RD	1.912	OFF	ON	OFF	OFF	ON		APPLIED				APPLIED
	4TH	1.446	OFF	ON	OFF	ON	OFF	APPLIED					APPLIED
	5TH	1.000	OFF	OFF	OFF	OFF	OFF	APPLIED	APPLIED				
	6TH	0.746	OFF	OFF	ON	ON	OFF	APPLIED		APPLIED			

* APPLIED WITH NO LOAD

COLUMN NUMBER	MISSING GEAR
1	FOURTH, FIFTH & SIXTH
2	REVERSE, THIRD & FIFTH
3	SECOND & SIXTH
4	FIRST (DRIVE)
5	REVERSE & NO ENGINE BRAKING IN FIRST
6	FIRST, SECOND, THIRD & FOURTH

A corresponding solenoid or regulator valve that is malfunctioning will result in the same gear application failure.

The ON/OFF Shift Solenoid acts on the Clutch Select Valve. A malfunction of this solenoid can cause no reverse or manual low.

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Figure 1



Technical Service Information

6T70 MISSING GEAR DIAGNOSIS

COLUMN NUMBER									1	2	3	4	5	6
RANGE	GEAR	RATIO	SHIFT SOL 1 (On/Off)	SHIFT SOL 2 (On/Off)	1-2-3-4CL PC SOL 5 N.L.	2-6 CL PC SOL 4 N.L.	3-5 REV CL PC SOL 2 N.H.	LO/REV 4-5-6 CL PC SOL 3 N.H.	4-5-6 CLUTCH	3-5 REV CLUTCH	2-6 CLUTCH	LO/REV CLUTCH	1-2-3-4 CLUTCH	LOW ONE-WAY CLUTCH
PARK	P		ON	ON	OFF	OFF	ON	OFF				APPLIED*		
REV	R	2.880	ON	OFF	OFF	OFF	OFF	OFF		APPLIED		APPLIED		
NEUT	N		ON	ON	OFF	OFF	OFF	ON				APPLIED*		
D R I V E	1ST BRAKING	4.484	ON	ON	ON	OFF	ON	OFF				APPLIED	APPLIED	
	1ST	4.484	OFF	ON	ON	OFF	ON	ON					APPLIED	HOLD
	2ND	2.872	OFF	ON	ON	ON	ON	ON			APPLIED		APPLIED	
	3RD	1.842	OFF	ON	ON	OFF	OFF	ON		APPLIED			APPLIED	
	4TH	1.414	OFF	ON	ON	OFF	ON	OFF	APPLIED				APPLIED	
	5TH	1.000	OFF	ON	OFF	OFF	OFF	OFF	APPLIED	APPLIED				
	6TH	0.742	OFF	ON	OFF	ON	ON	OFF	APPLIED		APPLIED			

* APPLIED WITH NO LOAD

COLUMN NUMBER	MISSING GEAR
1	FOURTH, FIFTH & SIXTH
2	REVERSE, THIRD & FIFTH
3	SECOND & SIXTH
4	REVERSE & NO ENGINE BRAKING IN FIRST
5	FIRST (DRIVE)
6	FIRST, SECOND, THIRD & FOURTH

A corresponding solenoid or regulator valve that is malfunctioning will result in the same gear application failure.

The ON/OFF Shift Solenoid 1 acts on the Actuator Feed Limit Valve. A malfunction of this solenoid can cause no converter clutch application.

The ON/OFF Shift Solenoid 2 acts on the Clutch Select Valve. A malfunction of this solenoid can cause no first, fourth, fifth or sixth gears.

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Figure 2



Technical Service Information

6L50/80/90 MISSING GEAR DIAGNOSIS

COLUMN NUMBER							1	2	3	4	5	6
RANGE	Shift Sol. 1 (On/Off)	Shift Sol. 2 (On/Off)	CPC Sol. 5 1-2-3-4 CL. (N.L.)	CPC Sol. 4 2-6 CL. (N.L.)	CPC Sol. 2 3-5 Rev CL. (N.H.)	CPC Sol. 3 4-5-6, Low/Rev CL. (N.H.)	1-2-3-4 Clutch	3-5, Rev Clutch	4-5-6 Clutch	2-6 Clutch	Low & Rev Clutch	Low Sprag
Park	ON	ON	OFF	OFF	ON	OFF					Applied	
Reverse	ON	OFF	OFF	OFF	OFF	OFF		Applied			Applied	
Neutral	ON	ON	OFF	OFF	ON	OFF					Applied	
"D"-1st	ON	ON	ON	OFF	ON	ON	Applied				Applied	Holding
"D"-2nd	OFF	ON	ON	ON	ON	ON	Applied			Applied		
"D"-3rd	OFF	ON	ON	OFF	OFF	ON	Applied	Applied				
"D"-4th	OFF	ON	ON	OFF	ON	OFF	Applied		Applied			
"D"-5th	OFF	ON	OFF	OFF	OFF	OFF		Applied	Applied			
"D"-6th	OFF	ON	OFF	ON	ON	OFF			Applied	Applied		
COLUMN NUMBER			MISSING GEAR									
1			FIRST, SECOND, THIRD & FOURTH									
2			REVERSE, THIRD & FIFTH									
3			FOURTH, FIFTH & SIXTH									
4			SECOND & SIXTH									
5			REVERSE & NO ENGINE BRAKING IN FIRST									
6			FIRST (DRIVE)									
<i>A corresponding solenoid or regulator valve that is malfunctioning will result in the same gear application failure.</i>												
<i>The ON/OFF Shift Solenoid 1 acts on the Clutch Select Valve 2. A malfunction of this solenoid can cause no fourth, fifth or sixth gears.</i>												
<i>The ON/OFF Shift Solenoid 2 acts on the Clutch Select Valve 3. A malfunction of this solenoid can cause no forward or reverse engagement.</i>												
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Figure 3



Technical Service Information

8L45/90 MISSING GEAR DIAGNOSIS

COLUMN NUMBER									1	2	3	4	5
RANGE	GEAR	1-2-7-8-Reverse Clutch S1 or E N.H.	1-2-3-4-5-Reverse Clutch Sol. S2 or F N.L.	1-3-5-6-7 Clutch Sol. S3 or C N.L.	2-3-4-6-8 Clutch Sol. S4 or B N.H.	4-5-6-7-8-Reverse Clutch Sol. S5 or D N.H.	Default Control Sol. S8 or G ON/OFF	1-2-3-4-5 Reverse Boost Sol. 9 or H ON/OFF	1-3-5-6-7 Clutch	4-5-6-7-8-Reverse Clutch	2-3-4-6-8 Clutch	1-2-7-8-Reverse Clutch	1-2-3-4-5-Reverse Clutch
Park	P	ON	ON	OFF	OFF	OFF	OFF	OFF		Applied		Applied*	Applied*
Reverse	R	ON	ON	OFF	OFF	ON	OFF	OFF				Applied	Applied
Neutral	N	ON	ON	OFF	OFF	OFF	OFF	OFF	Applied			Applied*	Applied*
D	1st	ON	ON	ON	OFF	OFF	OFF/ON	OFF			Applied	Applied	Applied
	2nd	ON	ON	OFF	ON	OFF	ON/OFF	OFF	Applied		Applied	Applied	Applied
	3rd	OFF	ON	ON	ON	OFF	OFF*	OFF		Applied	Applied		Applied
	4th	OFF	ON	OFF	ON	ON	OFF*	OFF	Applied	Applied			Applied
	5th	OFF	ON	ON	OFF	ON	OFF*	OFF	Applied	Applied	Applied		Applied
	6th	OFF	OFF	ON	ON	ON	OFF*	ON	Applied	Applied		Applied	
	7th	ON	OFF	ON	OFF	ON	OFF*	ON		Applied	Applied	Applied	
	8th	ON	OFF	OFF	ON	ON	OFF*	ON					

* APPLIED WITH NO LOAD

COLUMN NUMBER	MISSING GEAR
1	FIRST, THIRD, FIFTH, SIXTH & SEVENTH
2	FOURTH, FIFTH, SIXTH, SEVENTH, EIGHTH & REVERSE
3	SECOND, THIRD, FOURTH, SIXTH & EIGHTH
4	FIRST, SECOND, SEVENTH, EIGHTH & REVERSE
5	FIRST, SECOND, THIRD & FOURTH, FIFTH & REVERSE

A corresponding solenoid or regulator valve that is malfunctioning will result in the same gear application failure.

The ON/OFF Default Override Solenoid reacts to Default Latch S8 Signal Fluid. A malfunction of this solenoid can cause no converter clutch application and can also effect reverse engagement as well as gears first through fifth.

The ON/OFF 1-2-3-4-5-R Boost Solenoid acts on the 12345R clutch boost valve. A malfunction of this solenoid can affect the lube override circuit in gears third through eighth.

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Figure 4