

# General Diagnostic Table

## MANUAL TRANSMISSION AND DIFFERENTIAL

### 25. General Diagnostic Table

#### A: INSPECTION

##### 1. MANUAL TRANSMISSION

Symptoms	Possible cause	Corrective action
1. Gears are difficult to engage.  NOTE: If it is difficult to shift, there are two possible causes. One is a defective gear shift system and the other is defective transmission. However, if the operation is heavy and engagement of the gears is difficult, a defective clutch function may also be responsible. Check whether the clutch is correctly functioning, before checking the gear shift system and transmission.	(a) Worn, damaged or burred chamfer at internal spline of the sleeve  (b) Gear spline wear, damage, dents  (c) Worn or scratched bushings  (d) Incorrect contact or wear between synchronizer ring and gear cone	Replace.  Replace.  Replace.  Repair or replace.
2. Gear slip-out • Gear slips out when coasting on rough road. • Gear slips out during acceleration.	(a) Defective pitching stopper adjustment  (b) Loose engine mounting bolts  (c) Worn shifter fork, broken shifter fork rail spring  (d) Worn or damaged ball bearing  (e) Excessive clearance between splines of synchronizer hub and synchronizer sleeve  (f) Worn in the synchronizer hub chamfer angle  (g) Worn 1st driven gear, needle bearing and race  (h) Worn 2nd driven gear, needle bearing and race  (i) Worn 3rd drive gear and bushing  (j) Worn 4th drive gear and bushing  (k) Worn 5th drive gear and bushing  (l) Worn 6th drive gear and bushing  (m) Worn reverse idler gear and bushing	Adjust.  Tighten or replace.  Replace.  Replace.  Replace.  Replace.  Replace.  Replace.  Replace.  Replace.  Replace.  Replace.  Replace.
3. Noise emitted from transmission  NOTE: If a noise is heard when the vehicle is parked with its engine idling and ceases when the clutch is disengaged, it may be considered that the noise is coming from the transmission.	(a) Insufficient or improper lubrication  (b) Worn or damaged gears and bearings  NOTE: If the trouble is only wear of the gear teeth surfaces, only a high whirring noise will occur at high speeds, but if any part is broken, rhythmical clicking sounds will be heard even at low speeds.	Replenish or replace with the specified amount of recommended oil.  Replace.

# General Diagnostic Table

## MANUAL TRANSMISSION AND DIFFERENTIAL

### 2. DIFFERENTIAL

Symptoms	Possible cause	Corrective action
1. Broken differential (case, gear, bearing, etc.)  NOTE: Noise will occur, and eventually the differential will not be able to operate due to broken pieces obstructing the gear revolution.	(a) Insufficient or improper oil  (b) Use of vehicle under severe conditions such as excessive load and improper use of the clutch  (c) Improper adjustment of taper roller bearing  (d) Improper adjustment of the drive pinion and the hypoid driven gear  (e) Loose hypoid driven gear clamping bolts	Disassemble the differential and replace broken components. At the same time check other components for any trouble, and replace if necessary.  Readjust the preload and backlash of the bearing, and the contact surface of gear.  Adjust.  Adjust.  Tighten.
2. Differential and hypoid gear noise  Troubles of the differential and hypoid gear always appear as noise problems. Therefore noise is the first indication of trouble. However, noise from the engine, muffler, tire, exhaust gas, bearing, body, etc. are easily mistaken for noise from the differential. Pay special attention to the hypoid gear noise because it is easily confused with other gear noises. There are the following four kinds of noises. <ul style="list-style-type: none"><li>• Gear noise when driving: If noise increases as the vehicle speed increases, it may be due to insufficient gear oil, incorrect gear engagement, damaged gears, etc.</li><li>• Gear noise during coasting: Damaged gears due to misadjusted bearings and incorrect shim adjustment.</li><li>• Bearing noise when driving or coasting: Cracked, broken or damaged bearings.</li></ul>	(a) Insufficient oil  (b) Improper adjustment of hypoid driven gear and drive pinion  (c) Worn teeth of hypoid driven gear and drive pinion  (d) Loose roller bearing  (e) Distorted hypoid driven gear or differential case	Replenish or replace with the specified amount of recommended oil.  Check the tooth contact.  Replace as a set. Readjust the bearing preload.  Readjust the backlash of the hypoid driven gear to drive pinion, and check the tooth contact.  Replace.

## General Diagnostic Table

MANUAL TRANSMISSION AND DIFFERENTIAL

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# MANUAL TRANSMISSION AND DIFFERENTIAL (DIAGNOSTICS)

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