

**5DYM10 TRANSMISSION MAINTENANCE**

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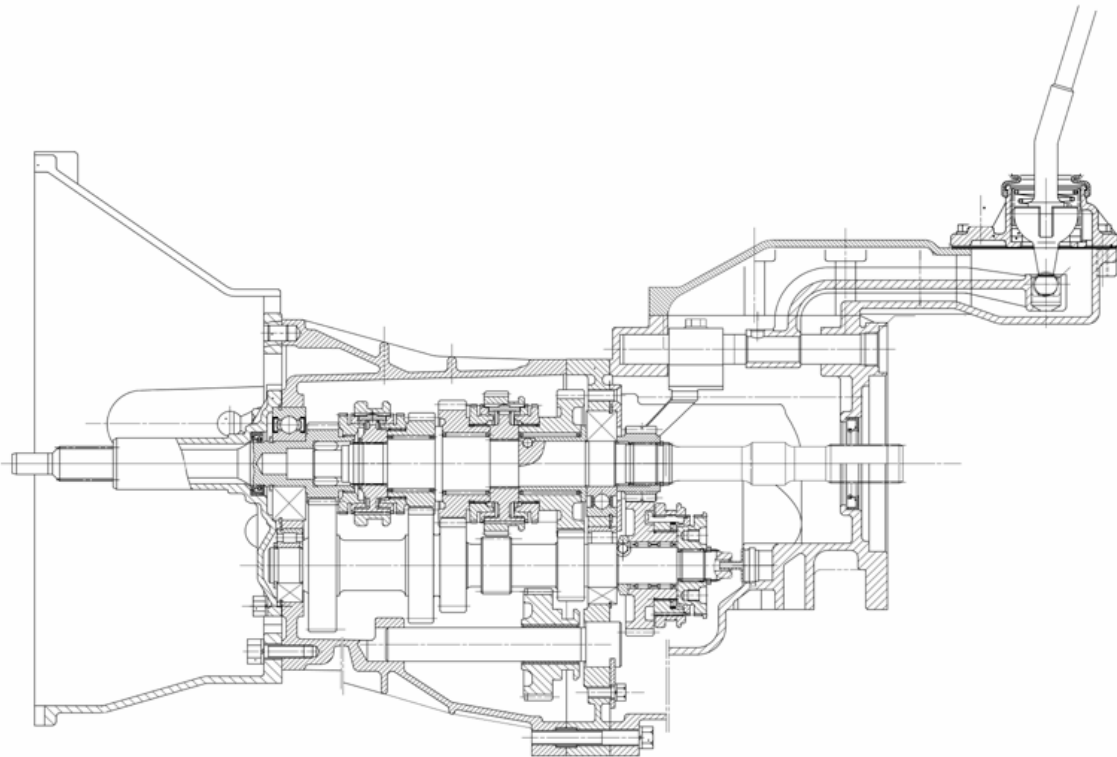
## Structure and Characteristics of Transmission

5DYM10 transmission is used on the 4-wheel drive (4WD) vehicles (BQ6473SG, BQ6473RSG, BQ2023G and BQ2023RG) equipped with 4G64 engine.

5DYM10 transmission is a three-axle step mechanical transmission. The inertia synchronizer gear shift is used for its forward gear. The smooth, stable, easy and light gear shift decreases the noise greatly and increases the gear life, resulting in good economy.

This 5-gear transmission control mechanism are not only installed with steering and spring, which ensure the flexible and accurate gear shafting and clear-cut hand feeling, but also equipped with interlock mechanism, which is used to prevent mistaken engagement to the reverse gear so as to increase the roadability and reliability.

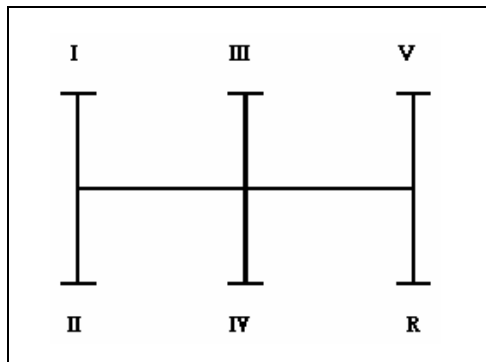
The transmission structure is compact and great in load carrying capacity. The product is aluminum alloy-cased, light and simple, and nice in appearance.



Schematic Diagram of 5DYM10 Structure

## Main Technical Data and Parameters

Max. Input Torque	196N.m					
Speed Ratio	I	II	III	IV	V	R
	3.704	2.020	1.369	1	0.802	4.4725
	3.9285	2.3333	1.4516	1	0.851	4.7435
	4.452	2.398	1.414	1	0.802	4.4725
4.452	2.619	1.517	1	0.854	4.4725	
Center Distance (mm)	72					
Oil Capacity (L)	3.3					
Operating Mode	Direct Operation					
Net Weight (kg)	41					
Matched Engine	4G64					



The speed positions are as shown in the Fig.

## **Reasonable Operation and Maintenance of Transmission**

### **1. Correct Operation of Transmission**

- (1) Gently conduct gear shifting without any sudden force.
- (2) Do not start at high speed.
- (3) Do not always put the hand on the gear lever during vehicle running to avoid the gear shifting yoke from early wear.

### **2. Used Oil Type: GL-4 SAE75W/90**

### **3. Caution for Use of New Vehicle**

When the new vehicle is in running-in status, replace the transmission oil after travel of 1,500km.

### **4. Three Level Transmission Maintenance:**

#### **(1) Level-1 Transmission Maintenance:**

During level-1 maintenance, check that the oil level is flush with the lower edge of the oil filler. Fill oil if not sufficient. Underlevel may cause bad lubrication and burning of bearing and gear, and overlevel may cause overheat and leakage.

#### **(2) Level-2 Maintenance:**

During the first level-2 maintenance of the new vehicle, replace the transmission oil, and clean with kerosene. During following level-2 maintenance, check the oil quality. Replace the oil if thinned, gummed or dirty.

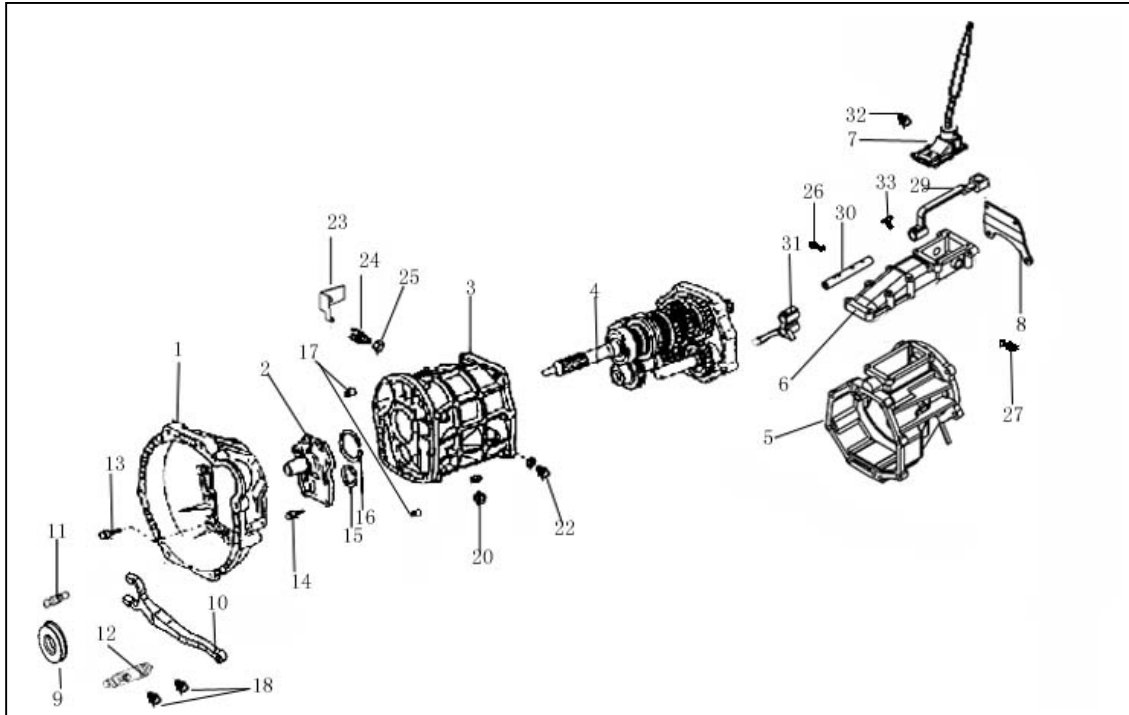
#### **(3) Level-3 Transmission Maintenance:**

During level-3 maintenance, conduct disassembly, inspection, cleaning and oil replacement.

## Removal, Spare List and Adjustment of Transmission

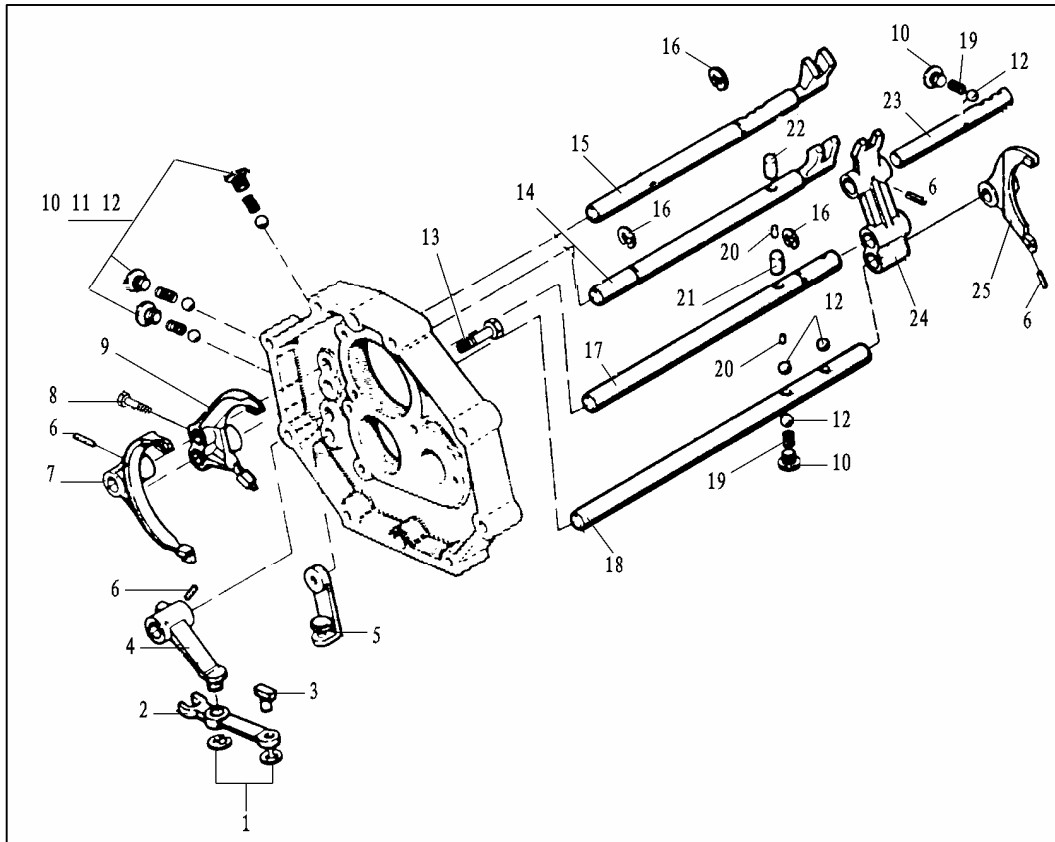
### 1. Disassembly of Transmission

Remove in order the clutch casing, front cover assembly, bearing retaining ring, rear body assembly, transmission casing and external connecting parts.



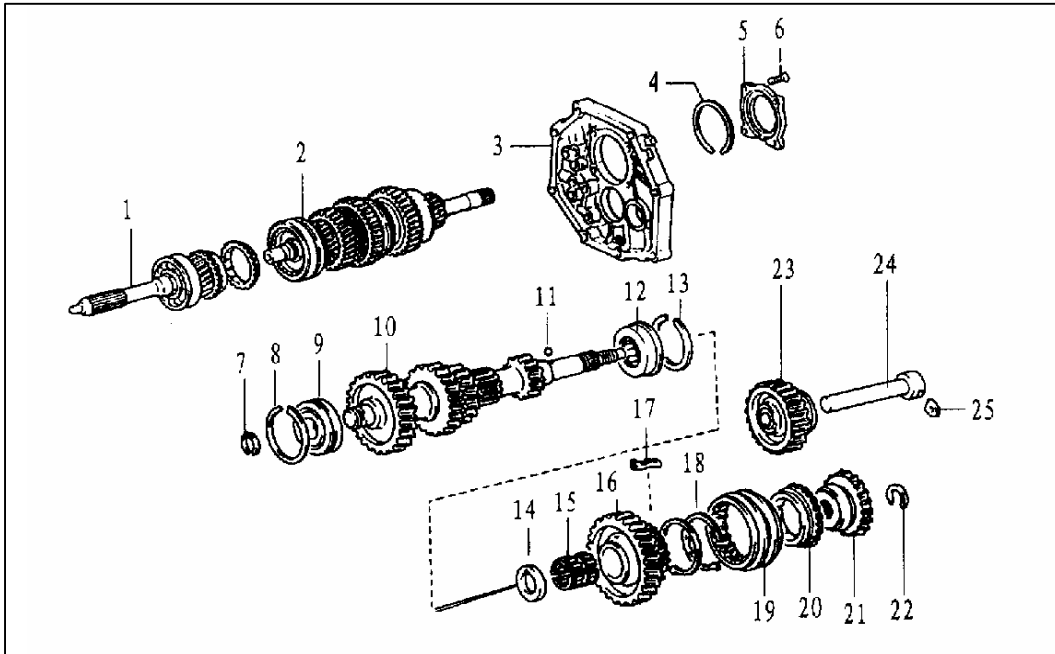
No.	Spare Description	No.	Spare Description
1	Clutch casing	16	Input shaft bearing retaining ring
2	Front cover assembly	17	Cylindrical pin
3	Casing	18	Hexagon head bolt with pad
4	Intermediate connecting plate assembly	20	Hexagon head magnetic plug (drain plug)
5	Rear body assembly	22	Hexagon head plug (filling plug)
6	Operating cover seat	23	Reverse speed switch cap
7	Operating cover assembly	24	Reverse speed switch assembly
8	Rack	25	Seal washer
9	Release bearing subassembly	26	Locating mechanism assembly
10	Release shifting yoke assembly	27	Locating mechanism assembly
11	Release shifting yoke pillar	29	Gear shifting block
12	Clutch slave cylinder subassembly	30	Gear selector shaft
13	Bolt	31	Gear shifting lever
14	Hexagon head bolt with pad	32	Vent plug
15	Intermediate shaft front bearing retaining ring	33	Gear shifting block locating screw

## (1) Removal of Intermediate Connecting Plate Assembly

**Disassembly of Intermediate Connecting Plate Assembly —  
Operation Section (Fig.)**

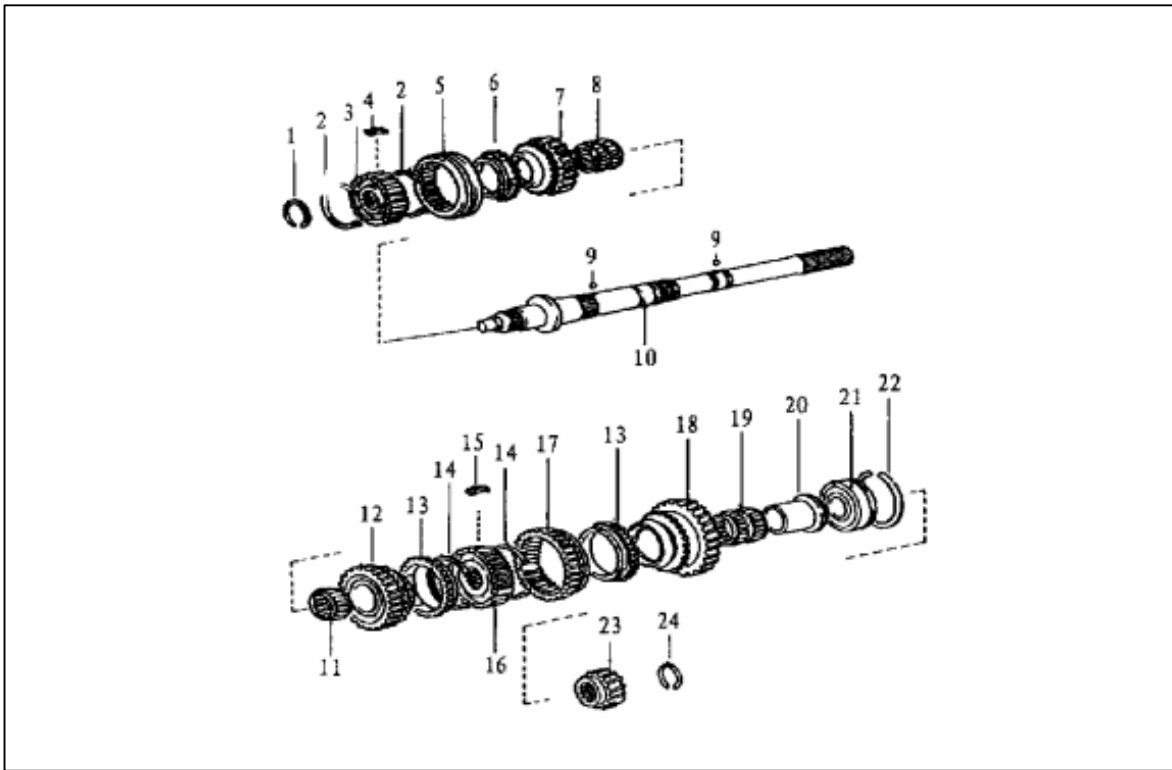
No.	Spare Description	No.	Spare Description
1	Snap retaining ring	14	1st/2nd speed shifting yoke shaft
2	Reverse speed rocker arm	15	3rd/4th speed shifting yoke shaft
3	Reverse speed shifting block	16	Clamp retaining ring
4	Reverse speed shifting lever	17	Reverse speed shifting yoke shaft
5	Reverse speed rocker arm rack assembly	18	5th speed shifting yoke shaft
6	Elastic cylindrical pin	19	5th speed yoke shaft locating spring
7	3rd/4th speed shifting yoke	20	Interlock guide post
8	1st/2nd speed shifting yoke locating screw	21	Interlock pin
9	1st/2nd speed shifting yoke	22	Short interlock pin
10	Locating spring plug	23	5th/R speed shifting yoke shaft
11	1st/2nd/3rd/4th/R speed yoke shaft locating spring	24	5th/R speed shafting guide
12	Steel ball	25	5th/R speed shifting yoke
13	Hexagon head bolt with pad		

**Disassembly of Intermediate Connecting Plate Assembly —  
Rotation (Drive) Section**



No.	Spare Description	No.	Spare Description
1	Input shaft subassembly	15	N/5th speed needle bearing
2	Output shaft subassembly	16	N/5th speed gear hub assembly
3	Intermediate connecting plate	17	5th speed synchronizer slide block
4	Output shaft rear bearing retaining ring	18	3rd/4th/5th speed spring ring
5	Output shaft rear bearing retaining plate	19	5th speed synchronizer meshing sleeve
6	Hexagon socket countersunk screw	20	3rd/4th/5th speed synchronizer toothed ring
7	Intermediate shaft front bearing retaining ring	21	5th speed connecting gear
8	Intermediate shaft front bearing stopping ring	22	Intermediate shaft rear bearing retaining ring
9	Intermediate shaft front bearing	23	Reverse speed idler assembly
10	Intermediate shaft connecting tooth	24	Reverse speed idler shaft
11	Steel ball	25	Reverse speed idler shaft press plate
12	Intermediate shaft rear bearing	26	Bolt with washer
13	Intermediate shaft rear bearing retaining ring		
14	5th speed thrust washer		

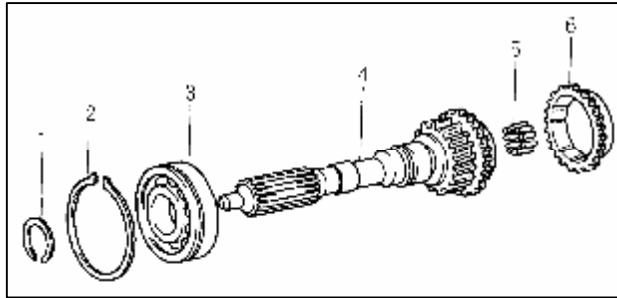
## Disassembly of Output Shaft Subassembly



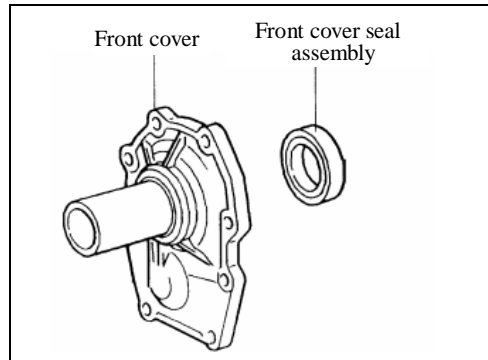
No.	Spare Description	No.	Spare Description
1	3rd/4th speed hub shaft retaining ring	14	1st/2nd speed synchronizer spring ring
2	3rd/4th/5th speed synchronizer spring ring	15	1st/2nd speed synchronizer slide block
3	3rd/4th speed synchronizer toothed hub	16	1st/2nd speed synchronizer toothed hub
4	3rd/4th speed synchronizer slide block	17	1st/2nd speed synchronizer meshing sleeve
5	3rd/4th speed synchronizer meshing sleeve	18	1st speed gear assembly
6	3rd/4th/5th speed synchronizer toothed ring	19	1st speed gear needle bearing
7	3rd speed gear assembly	20	1st speed gear shaft sleeve
8	3rd speed gear needle bearing	21	Output shaft rear bearing
9	Steel ball	22	Output shaft rear bearing retaining ring
10	Output shaft	23	5th speed gear
11	2nd speed gear needle bearing	24	5th speed gear shaft retaining ring
12	2nd speed gear assembly		
13	1st/2nd speed synchronizer toothed ring		



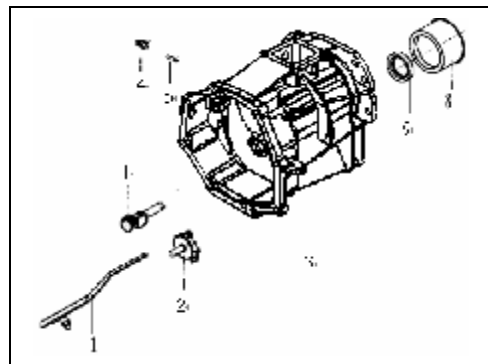
### Disassembly of Input Shaft Subassembly



No.	Spare Description
1	Input shaft retaining ring
2	Input shaft bearing retaining ring
3	Input shaft bearing
4	Input shaft assembly
5	Input shaft needle bearing
6	3rd/4th/5th speed synchronizer toothed ring

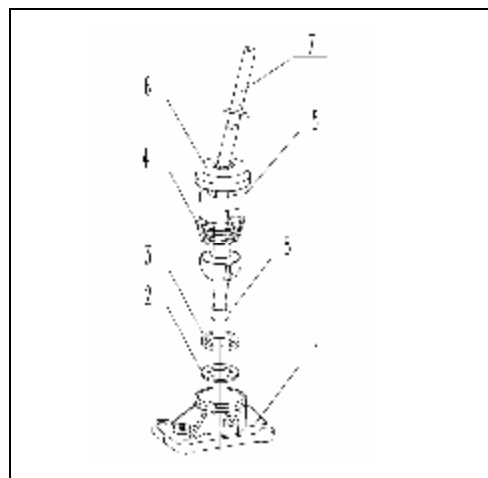


#### (2) Disassembly of front cover assembly



#### (3) Removal of rear body subassembly

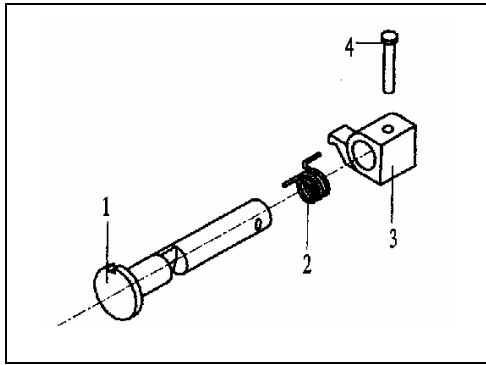
No.	Spare Description
1	Limiting mechanism assembly
2	Oil deflector
3	Rear body
4	Locating spring plug
5	Elastic cylindrical pin
6	Rear body seal subassembly



#### (4) Disassembly of operating cover subassembly

No.	Spare Description
1	Operating cover assembly
2	Rubber pad
3	Rubber pad
4	Shift lever spring
5	Shift lever spring seat
6	Boot
7	Shift Lever
8	Plastic spacer

(5) Disassembly of limiting mechanism assembly

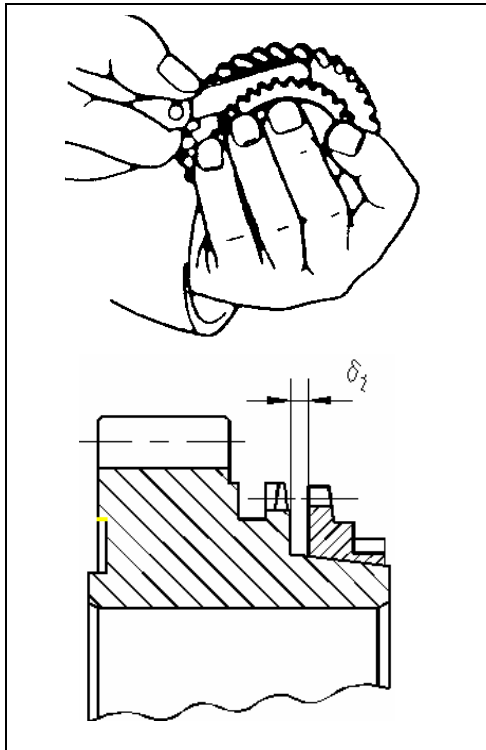


**No. Spare Description**

- 1 Limiting shaft
- 2 Limiting spring
- 3 Limiting block
- 4 Limiting pin

**2. Assembly and Adjustment of Transmission**

(1) Assembly is the reverse procedure of disassembly. For the specific steps, refer to the above exploded diagram.



(2) Technical Conditions for Assembly and Adjustment

a) check the axial gap ( $\delta$ ) between the synchronizer toothed ring and the gear.

Speed	I (δ1)	II (δ2)	III (δ3)	IV (δ4)	V (δ5)
Standard gap (mm)	1~2	1~2	1~2	1~2	1~2
Limited gap (mm)	0.8	0.8	0.8	0.8	0.8

b) Check the axial gap of all the gears.

Speed	I (δ1)	II (δ2)	III (δ3)	V (δ5)
Axial gap (mm)	0.1~0.25	0.09~0.26	0.09~0.26	0.1~0.3

c) Tightening torques of main threaded fasteners

Description	Specification	QTY	Tightening Torque N·m	Application Position	Remarks
Bolt	M8X1.25	8	15-20	No. 1 shaft cover	Thread applied with sealant
Bolt	M10X1.25	8	30-45	Coupling casing, intermediate connecting plate and rear body	
Filling/drain plug	M18X1.5	3	30-50	Casing	
Reverse speed switch assembly	M18X1.5	1	30-50	Casing	
Stud	M10X1.25	1	22-30	Rear body	
Bolt	M10X1.25	9	30-45	Coupling clutch casing and housing	

**(3) Caution for Assembly**

- a) Clean all the parts (except rubber parts and pads) before assembly.
- b) Do not reuse the oil seal, shaft retaining ring and elastic pin.
- c) Apply oil to friction face, and apply grease to seal lip.
- d) Do not transfer pressure with roller when installing bearing.
- e) Do not decline the lip seal when installed.
- f) Place the spring rings on the two sides with their openings at a certain interval when installing the synchronizer assembly.
- g) When the transmission is at normal operation position, check all the portions for oil leakage.

## Troubleshooting of Transmission

Common Trouble	Cause	Remedy
Gear engagement hard	Clutch is not used.	Use correct drive method.
	Clutch release incomplete.	Check and adjust.
	Synchronizer toothed ring damaged seriously	Replace the parts.
	Locating spring too strong.	Replace the part.
Noise excessive or abnormal.	Oil level too low.	Add oil to the standard.
	Oil quality bad.	Replace with stipulated oil.
	Oil change not timely.	Replace the oil and damaged part.
	Gear axial position and gap unsatisfactory.	Check and adjust.
	Bearing damaged.	Replace the part.
	Tooth burred or crashed.	Repair or replace the gear.
Leakage	Oil excessive and level too high.	Lower oil level to the stipulated position.
	Bolt loose or missing.	Reinstall and tighten to the stipulated torque.
	Vent plug fails.	Replace.
	Seal damaged.	Replace.
Synchronizer damaged.	Gear shifting with sudden force.	Replace.
	Clutch not used.	Use correct drive method.
	Synchronizer spring ring damaged	Replace.
	Drive shaft installed improperly.	Check and adjust.
Gear Sliding	Operating mechanism faulty.	Check and adjust.
	Locating spring or steel ball missing	Reinstall.
	Locating spring fails.	Replace.
	Gear sleeve fork groove worn seriously.	Replace.
	Shifting yoke worn seriously.	Replace.
Bearing and gear burnt	Oil level too low.	Replace part and fill oil.
	Oil bad.	Replace part and oil.
	Oil change not timely and oil dirty.	Replace part and oil.
	Different oils mixed in use or additive used.	Replace part and oil.
Gear disengagement hard	Synchronizer spring fails.	Replace.
	Synchronizer toothed ring inner groove worn.	Replace.
	Synchronizer toothed ring seized on conical surface.	Replace.
	Shifting yoke or shifting yoke shaft deformed.	Replace.
	Shifting yoke worn seriously.	Replace.