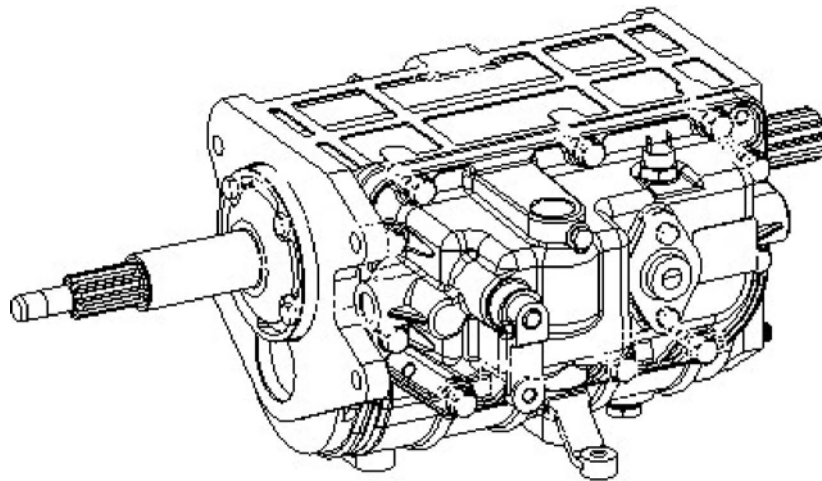




BGC255A

**AUTOMOTIVE TRANSMISSION SERVICE
INSTRUCTION**



BEIJING GEAR CO., LTD.

CATALOG

GENERAL DESCRIPTION

BGC255A ASS'Y TECHNICAL DATA

BOLT TIGHTENING TORQUE

ASSEMBLY GAP

SEAL AND LUBRICATING

TRANSMISSION AND DETAILS

ASSEMBLY AND SERVICEING

TRANSMISSION SUB ASSEMBLY

TRANSMISSION SET FINAL ASSEMBLY

TRANSMISSION DISMANTLEMENT

TROUBLESHOOTING

AFTERSERVICE

TRANSMISSION EASILY-WORE PARTS LIST

BGC255A ASS'Y TECHNICAL DATA

Max Output Torque (Nm)		250
Max Input Rotation Rate (r/min)		5000
Center Distance (mm)		78
Weight (Kg)		48
Gear Ratio	1 st	3.83
	2 nd	2.167
	3 rd	1.292
	4 th	1.000
	5 th	0.795
	Reverse	3.52
Lubricating Oil	Specification	75W-85(SK G-F) GL-4
	Capacity(liter)	1.7

BOLT TIGHTENING TORQUE

Bolt	Tightening torque (Nm)
M6	8-15
M8	25-35
M10	45-60
M14×1.5	30-45
Z1/2 "	20-34

ASSEMBLY GAP

Output shaft gear assembly gap

Position	Axial clearance (mm)
Gear-1st speed	0.17~0.3
Gear-2nd speed	0.12~0.25
Gear-3rd speed	0.15~0.37
Gear-5th speed	0.17~0.35
Reverse gear	0.12~0.25

Countershaft bearing axial gap adjustment: 0.08—0.15mm。

SEAL AND LUBRICATING

Seal

Must smear sealant evenly at the interface of the shell and side cover.

Bolts screwed into thread through holes on the casing must coat thread sealant.

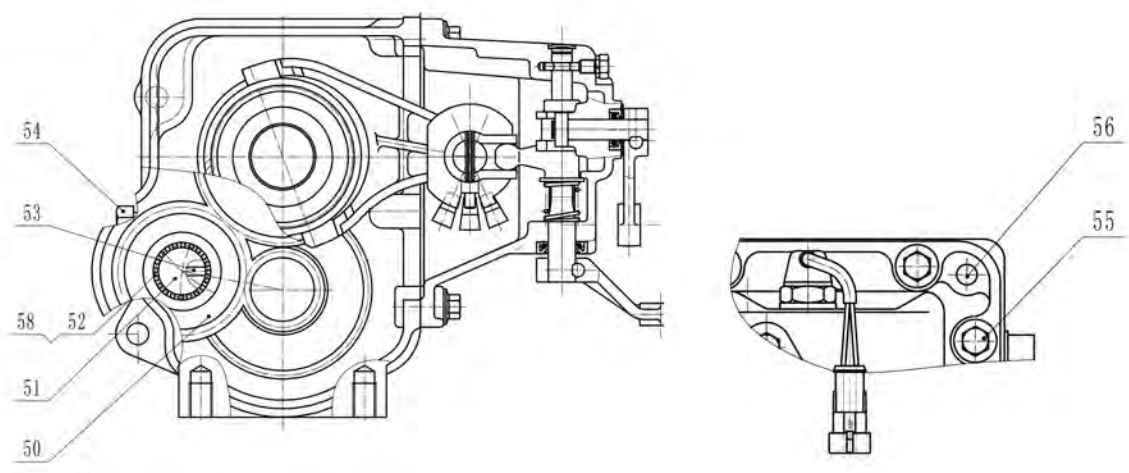
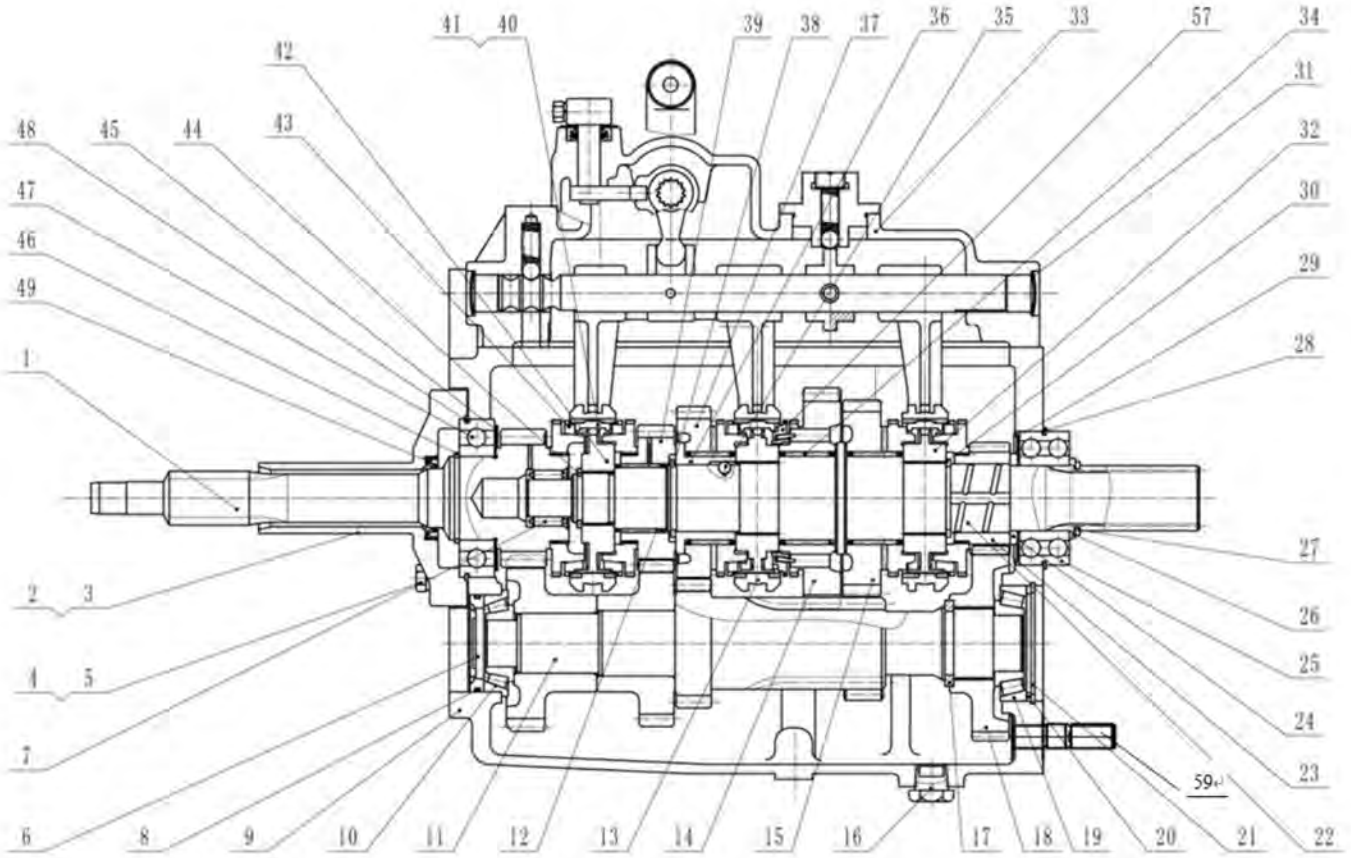
Lubrication

To coat the lip of oil seals with calcium grease and gears, synchronizer rings and bearings with lubricating oil.

Lubricating Oil

Transmission assembly rule using 75W-85(SK G-F) GL-4 lubricating oil, and its capacity is 1.7 liters (If there is no measuring cup, can be observed when oil is added until it overflow the oil way).

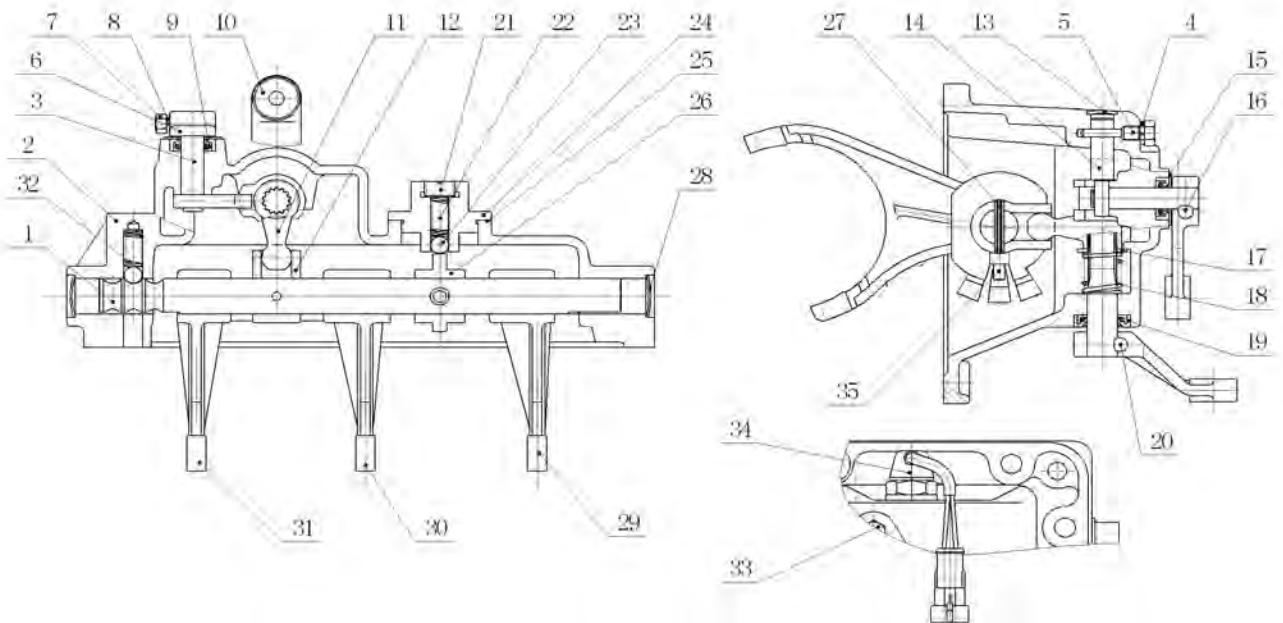
TRANSMISSION AND DETAILS



※ Transmission assembly Parts List

NO.	Code Name	Part Name	Qty.	Specification
1	255-1701029	Input shaft sub assembly	1	
2	255-1701040	Bearing cover-input shaft	1	
3	255-1701042	Paper gasket	1	
4	GB/T 5783	Bolt	4	M8X35-8.8
5	GB/T 93	Washer	12	8
6	255-1701180	Countershaft bearing cover	1	
7	255-1701106	Rolling bearing	1	
8	GB3452.1	“O” ring seal	1	47.5X2.65
9	255-1701015	Transmission case	1	
10	GB/T 4648	Rolling bearing	1	L30205
11	255-1701049	Countershaft sub assembly	1	
12	255-1701133	Needle bearing	1	
13	255-1701140	The spotting assembly of the Hub-trans.syn.1st&2 nd and synchronizer sleeve	1	
14	255-1701110	Gear-1st speed	1	
15	255-1701155	Reverse gear	1	
16	255-1701016	Drain plug	1	
17	255-1701056	Snap spring	1	
18	255-1701054	5 th speed gear --- Countershaft	1	
19	GB/T 297	Rolling bearing	1	30206
20	255-1701060	Ring riser		
21	GB/T 893.2	Retainer ring	1	62
22	255-1701105	Output shaft	1	
23	255-1701150	5 th speed gear sub assembly	1	
24	255-1701152	Shim—5th speed gear	1	
25	255-1701153	Bearing	1	
26	255-1701154	Bearing shim	1	
27	255-1701156	Snap ring	1	
28	GB305	Thrust washer	1	72/78.6
29	255-1701157	Oil baffle-output shaft bearing	1	
30	255-1701122	Snap ring	1	
31	Q72124	Expansion plug	2	
32	255-1701170	The spotting assembly of the Hub-trans.syn.5th&rev and synchronizer sleeve	1	
33	255A-1702010A	Side cover	1	
34	GB/T 5846	Needle bearing	3	K455027
35	GB/T 308	Friction ball	1	1/4"
36	255-1701121	Spacer-2nd speed gear	1	
37	255-1701120	Gear- 2nd speed	1	
38	255-1701122	Snap ring	1	

39	255-1701130	3 rd speed gear sub assembly	1	
40	255-1701144	Synchronizer insert	9	
41	255-1701145	Synchronizer spring	6	
42	255-1701160	The spotting assembly of the Hub-trans.syn.3rd&4th and synchronizer sleeve	1	
43	255-1701143	Synchronizer ring	4	
44	255-1701162	Lock ring - syn. Hub 3rd&4th	1	
45	255-1701035	Bearing oil baffle	1	
46	255-1701036	Thrust washer	1	
47	GB/T 276	Rolling bearing	1	6209N
48	255-1701034	Snap ring	1	
49	255-1701043	Oil seal	1	
50	255-1701080	Reverse idler gear	1	
51	255-1701081	Reverse idler shaft	1	
52	GB/T 5846	Needle bearing	1	KK283435
53	GB/T 879	Elasticity straight pin	1	5X20
54	Q618B04	Tapered plug	1	
55	GB/T 5787	Bolt	11	M10X30-8.8
56	255-1701019	Cylindrical locating pin	2	10X16
57	255-1701115	Synchronous ring assembly	1	
58	255-1701020	Gland cover	1	
59	255-1702062	Double end stud	1	



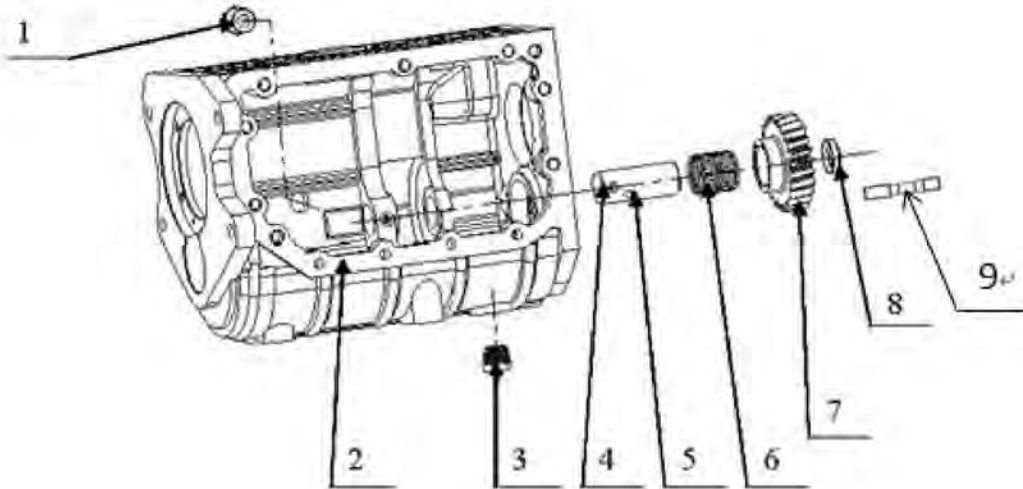
※ Parts List

NO.	Code Name	Part Name	Qty.	Specification
1	255A-1702015	Fork shaft	1	
2	255A-1702010A	Side cover	1	
3	255A-1702120	Selector shaft assembly	1	
4	GB93	Washer	1	8
5	255A-1702030	Positioning bolt	1	
6	255A-1702123	Rocker gear selection	1	
7	GB6170	Nut	2	M6
8	GB93	Washer	2	6
9	GB9877.1	Oil seal	1	FB122406
10	255A-1702124	Shifting rockers	1	
11	255A-1702125	Gear shifting block	1	
12	255A-1702026	Shifting block	1	
13	Q72116	Patch	1	
14	255A-1702127	Shift gear shaft	1	
15	255A-1702132	Gasket	1	
16	255A-1702128	Stop pin	1	
17	255A-1702129	Pillow	1	
18	255A-1702130	Spring	1	
19	GB9877.1	Oil seal	1	FB163006
20	255A-1702131	Shifting rockers stop pin	1	
21	255-1702036	Plug	1	

22	255-1702034	Spring	1	
23	GB308	Steel ball	2	3/8 "
24	255-1702032	Retainer	1	
25	255-1702033	Retainer gasket	1	
26	255-1702030	Lock board	1	
27	GB879	Pin	1	5×30
28	Q72124	Expansion plug	2	
29	255-1702024	5 th and reverse gear shift fork	1	
30	255-1702020	1 st &2 nd gear shift fork	1	
31	255-1702021	3 rd &4 th gear shift fork assembly	1	
	255-1702025	3 rd &4 th gear shift fork lever	(1)	
	255-1702023	3 rd &4 th gear shift fork	(1)	
	GB879	Pin	(1)	5×20
32	255-1702035	Spring	1	
33	GB5783	Bolt	2	M8×22-8.8
34	255-1702050	Switch	1	
	Q72314T8	Papery washer	(1)	
35	255-1702031	Gear shift pin	1	

TRANSMISSION SUB ASSEMBLY

Transmission case sub assembly

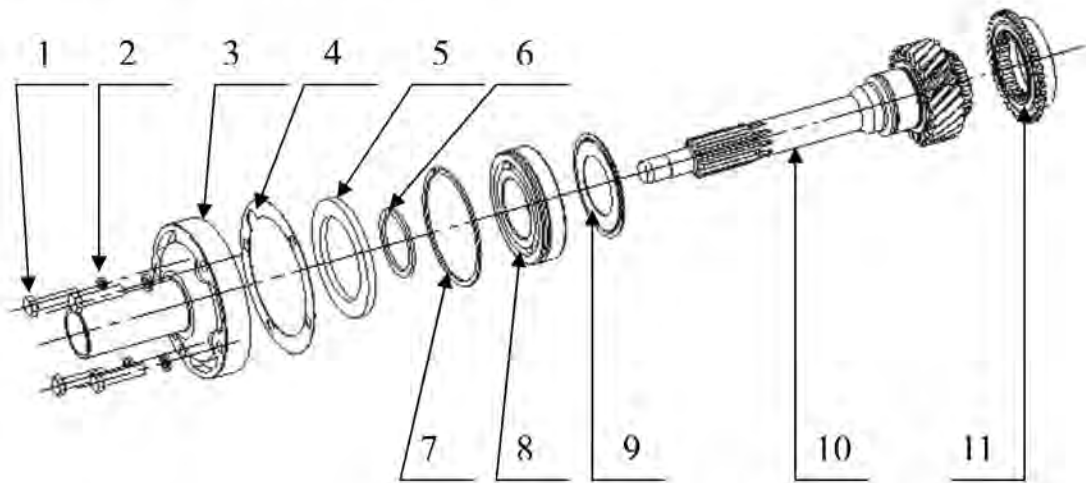


※ Transmission case sub assembly Parts List

NO.	Code Name	Part Name	Qty.	Specification
1	Q618B04	Tapered plug	1	
2	255-1701015A	Transmission case	1	
3	255-1701016	Drain plug	1	
4	255-1701081	Reverse idler shaft	1	
5	GB879	Elasticity straight pin	1	5X20
6	GB5846	Needle bearing	1	KK283435
7	255-1701080	Reverse idler gear	1	
8	255-1701020	cap	1	
9	255-1702062	Double end stud	1	

Commentary: The part of the serial number 8 requires spread sealant to

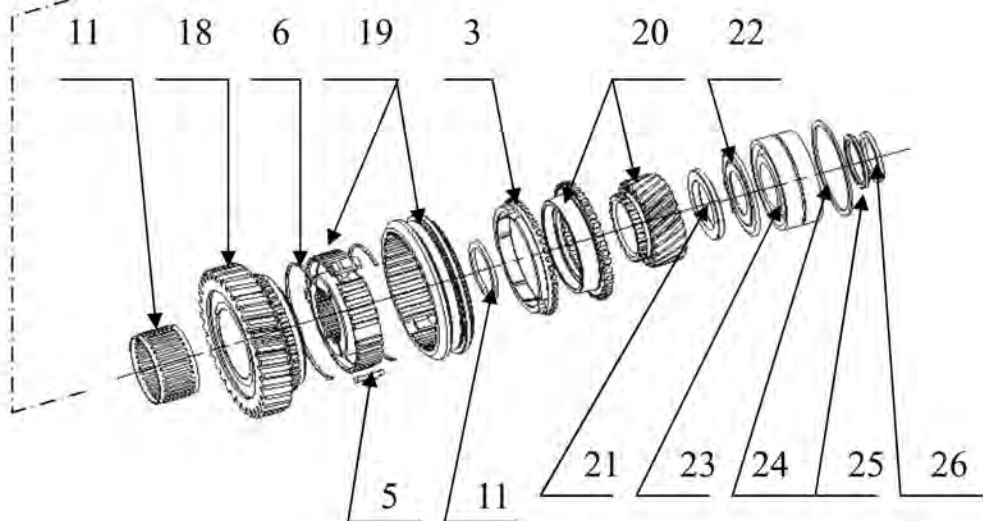
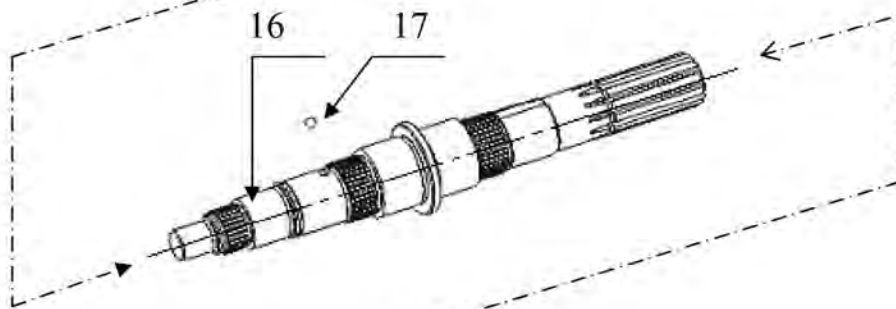
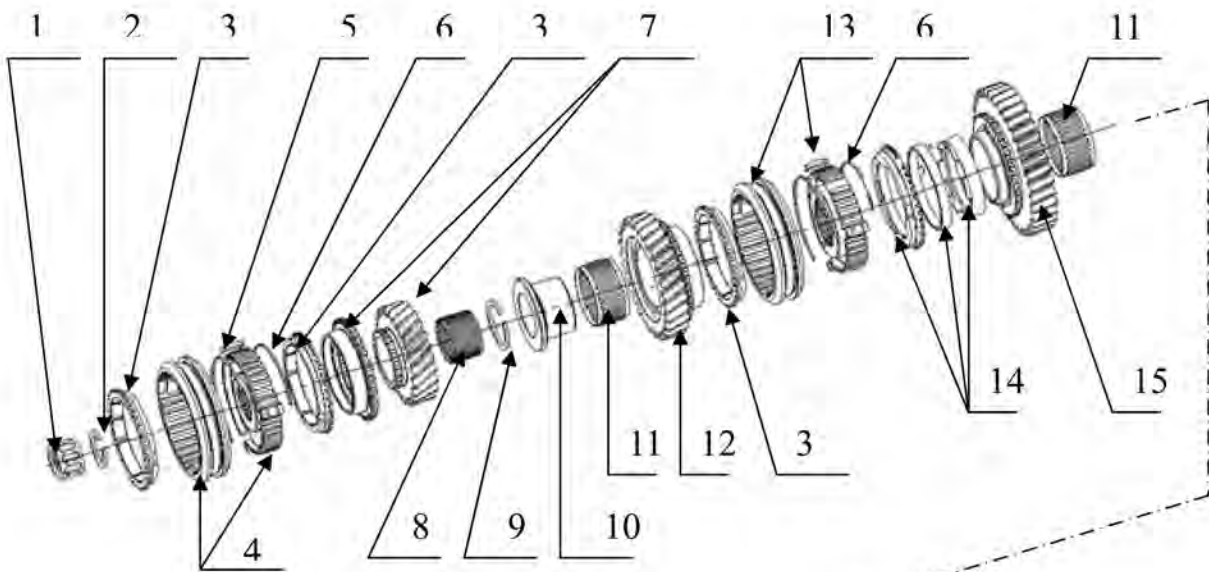
The input shaft correlation parts



※ Input shaft Assembly Parts List

NO.	Code Name	Part Name	Qty.	Specification
1	GB5783	Bolt	4	M8×35
2	GB93	Washer	4	8
3	255-1701040	Bearing cover-input shaft	1	
4	255-1701042	Paper gasket	1	
5	255-1701043	Oil seal	1	
6	255-1701036	Thrust washer	1	
7	255-1701034	Snap ring	1	
8	GB/T 276	Rolling bearing	1	6209N
9	255-1701035	Bearing oil baffle	1	
10	255-1701030	Input shaft	1	
11	255-1701031	Join gear ring-dir. Gear	1	

The output shaft sub assembly



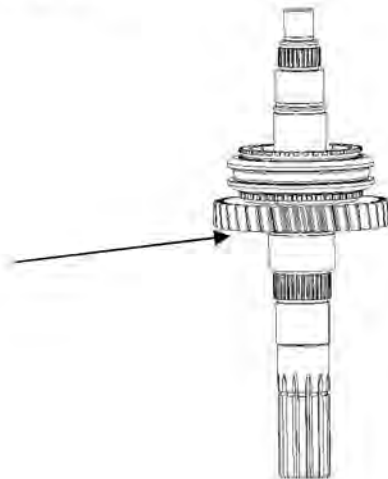
※ Output shaft Assembly Parts List

NO.	Code Name	Part Name	Qty	Specification
1	255-1701106	Rolling bearing	1	
2	255-1701162	Lock ring - syn. Hub 3rd&4th	1	
3	255-1701143	Synchronizer ring	4	
4	255-1701160	The spotting assembly of the Hub-trans.syn.3rd&4th and synchronizer sleeve	1	
5	255-1701144	Synchronizer insert	9	
6	255-1701145	Synchronizer spring	6	
7	255-1701130	3 rd speed gear sub assembly	1	
8	255-1701133	Needle bearing	1	
9	255-1701122	Snap ring	2	
10	255-1701121	bush-2nd speed gear	1	
11	GB5783	Needle bearing	3	K455027
12	255-1701120	Gear- 2nd speed	1	
13	255-1701140	The spotting assembly of the Hub-trans.syn.1st&2 nd and synchronizer sleeve	1	
14	255-1701115	Synchronous ring assembly	1	
15	255-1701110	Gear-1st speed	1	
16	255-1701105	Output shaft	1	
17	GB308	Friction ball	1	1/4"
18	255-1701155	Reverse gear	1	

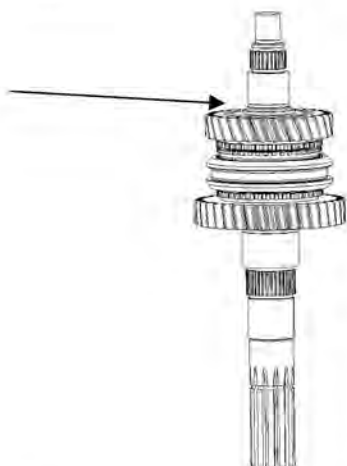
19	255-1701170	The spotting assembly of the Hub-trans.syn.5th&rev and synchronizer sleeve	1	
20	255-1701150	5 th speed gear sub assembly	1	
21	255-1701152	Shim— 5th speed gear	1	
22	255-1701157	Oil baffle-output shaft bearing	1	
23	255-1701153	Bearing	1	
24	GB305	Thrust washer	1	72/78.6
25	255-1701154	Bearing shim	1	
26	255-1701156	Snap ring	1	

The assembly gap of the gears on output shaft

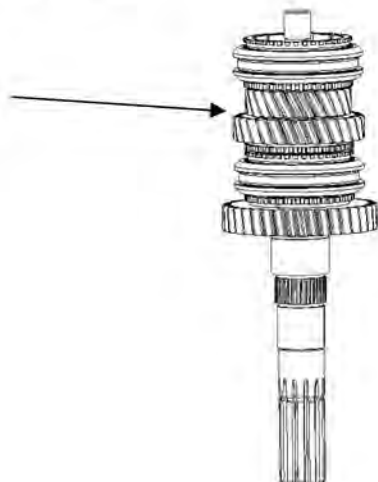
Gear-1st speed: 0.17~0.3mm



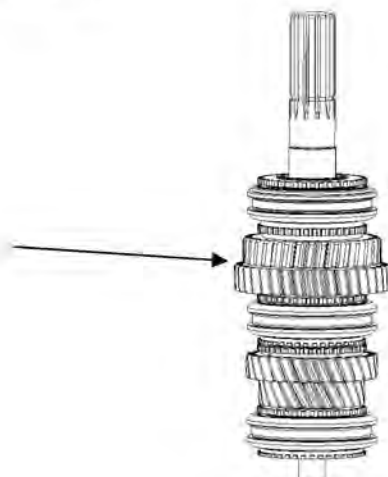
Gear-2nd speed: 0.12~0.25mm



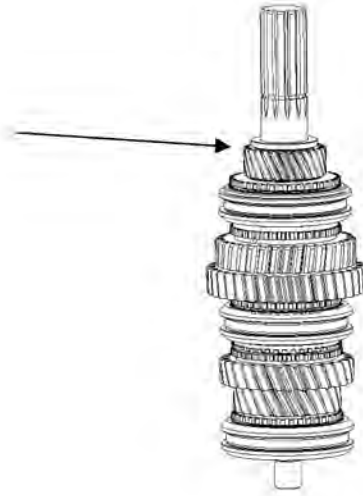
Gear-3rd speed: 0.15~0.37mm



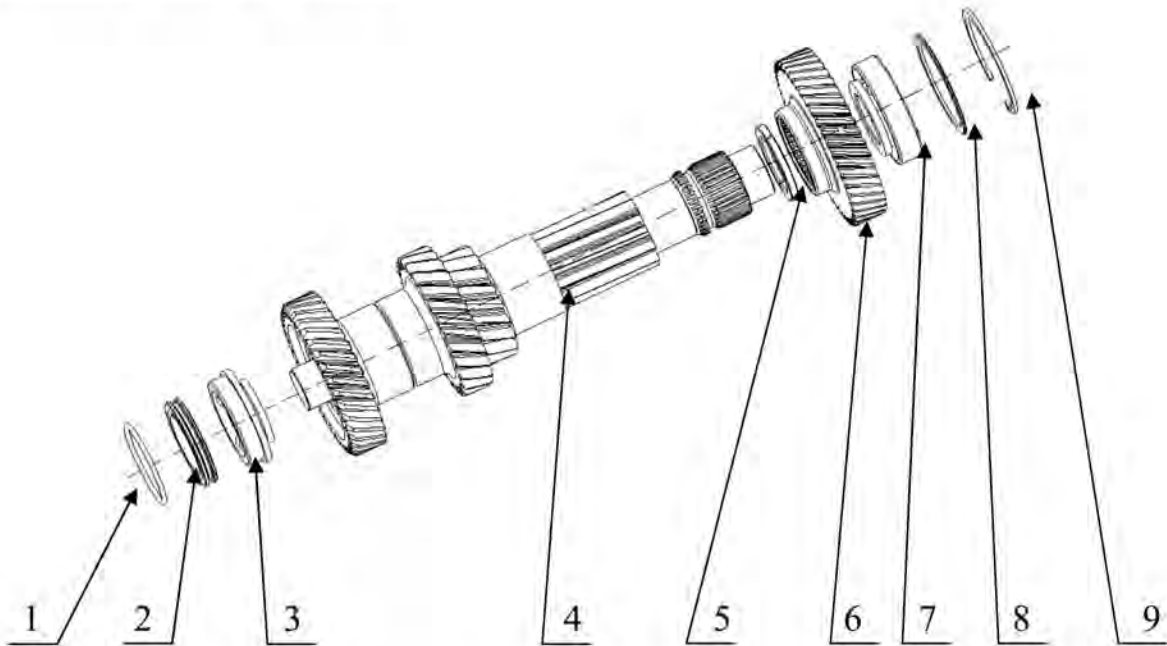
Reverse gear: 0.12~0.25mm



Gear-5th speed: 0.17~0.35mm



The countershaft sub assembly

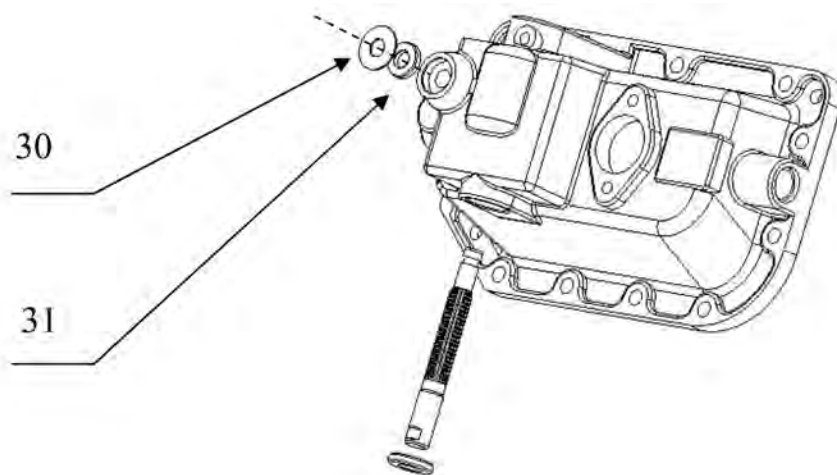
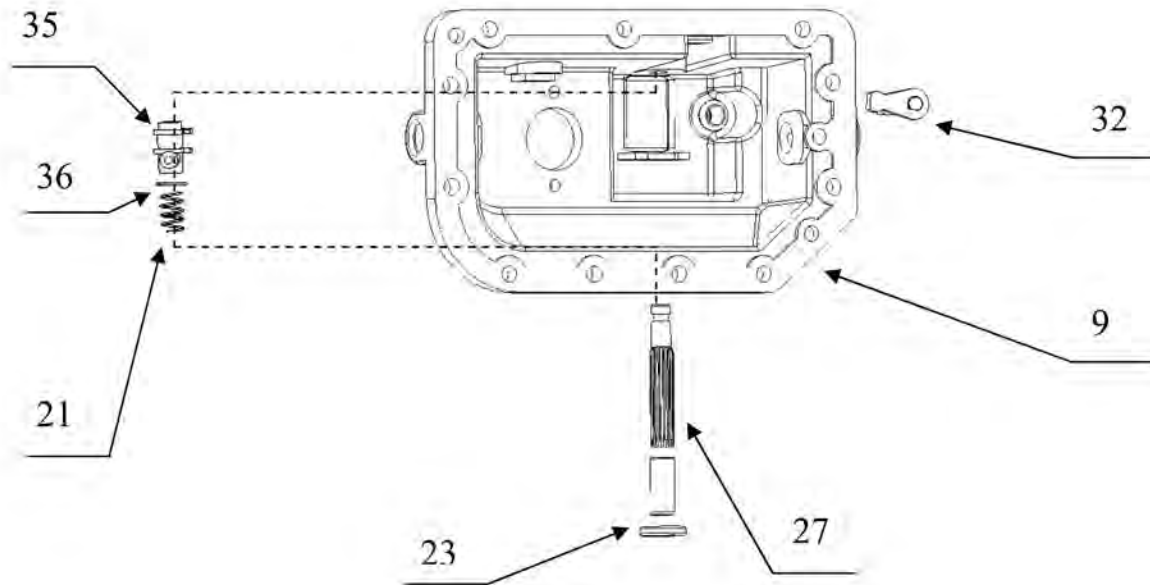


※ The countershaft sub assembly Parts List

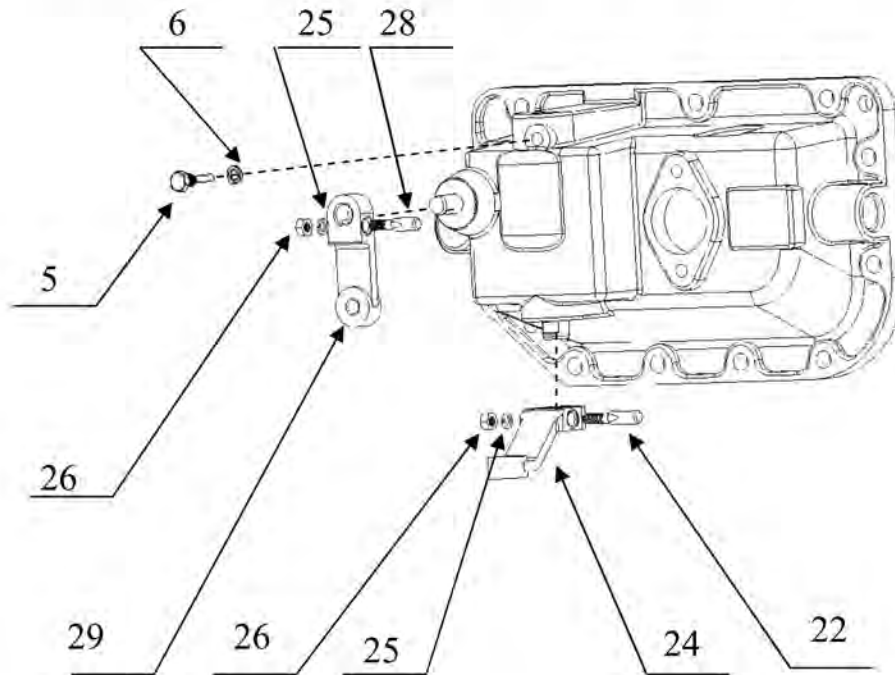
NO.	Code Name	Part Name	Qty.	Specification
1	GB3452.1	“O” ring seal	1	47.5×2.65
2	255-1701180	Countershaft bearing cover	1	
3	GB/T4846	Rolling bearing	1	L30205
4	255-1701049	Countershaft sub assembly	1	
5	255-1701056	Snap spring	1	
6	255-1701054	5 th speed gear	1	
7	GB/T 297	Rolling bearing	1	30206
8	255-1701060	Ring riser	As required	
9	GB893.2	Retainer ring	1	62

Side cover sub assembly

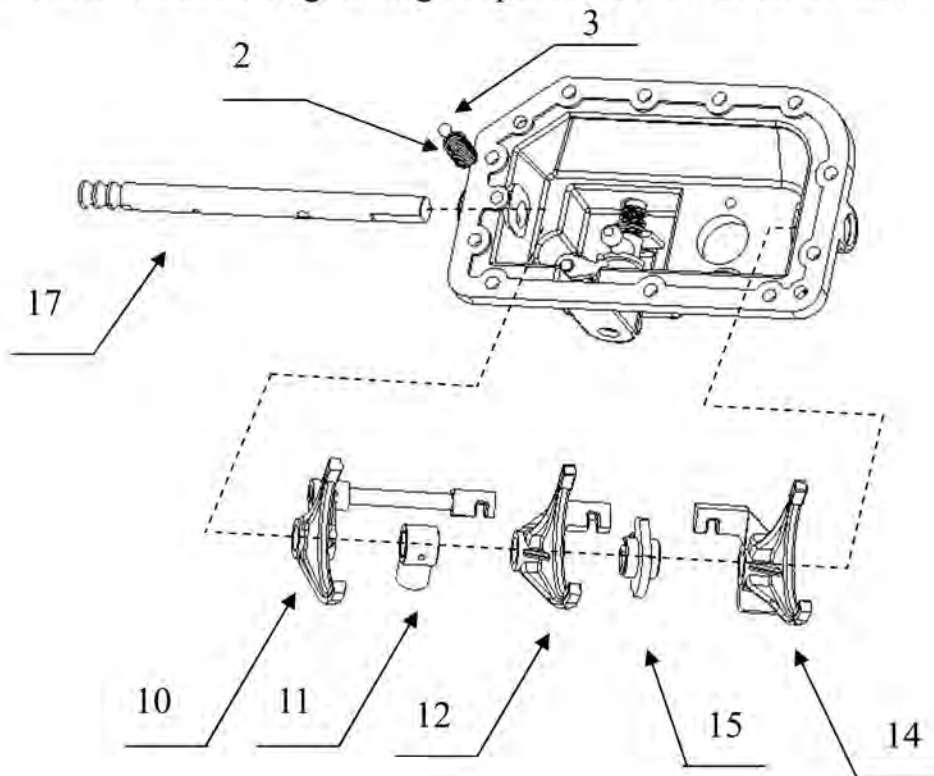
1. Install the parts 23, 31, 21, 36, 35, 27, 32, 30 in turn. Notably the parts 23 and 31 should be coated with calcium grease before installed.

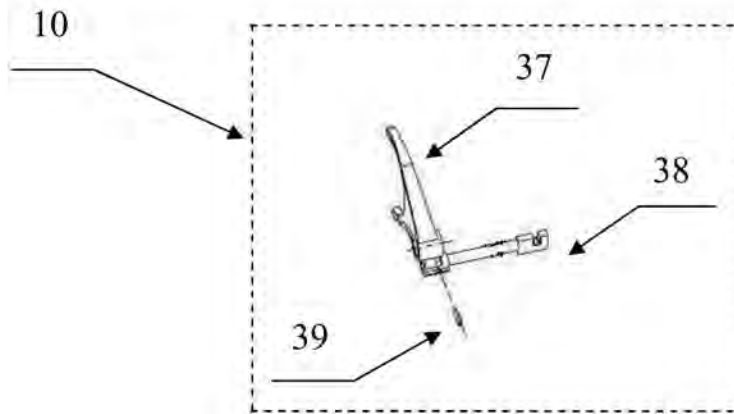


2. Install the parts 24, 22, 25, 26, 6, 5, 29, 28, 25, 26 in turn.

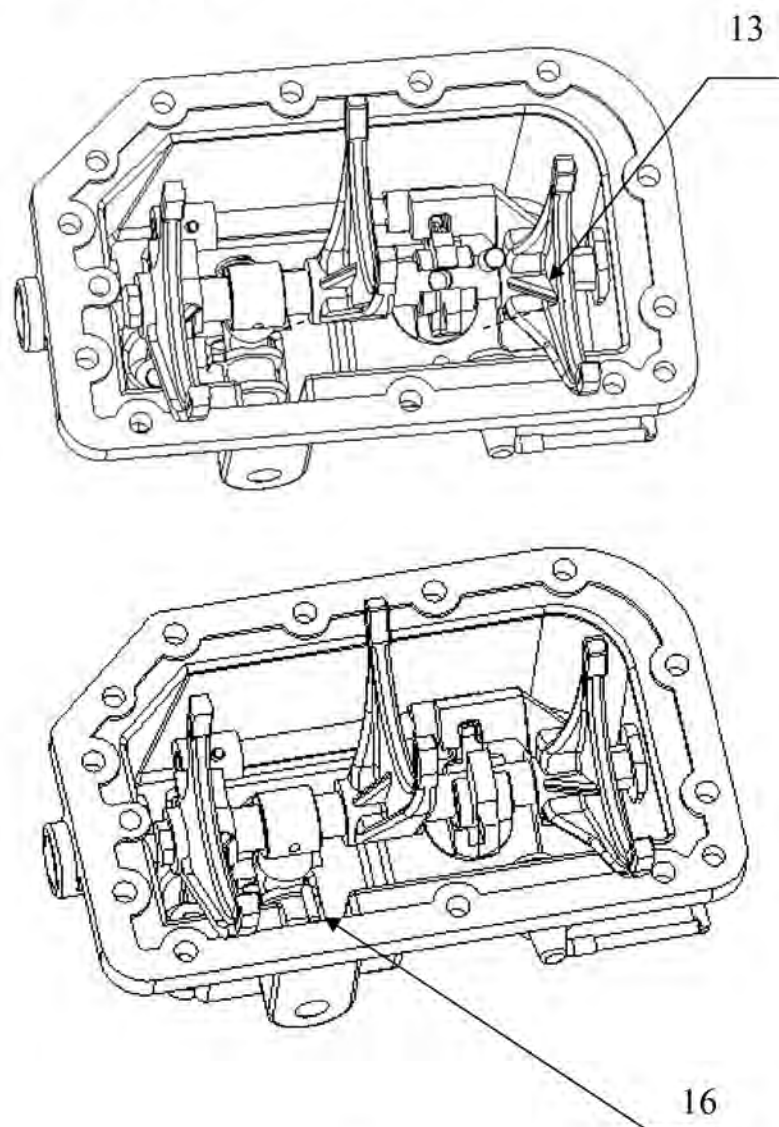


3. Install the parts 2, 3, 17, 10, 11, 12, 15, 14 in turn. Tightening torque of bolt M6 is 8-15Nm and tightening torque of bolt M8 is 25-35Nm.

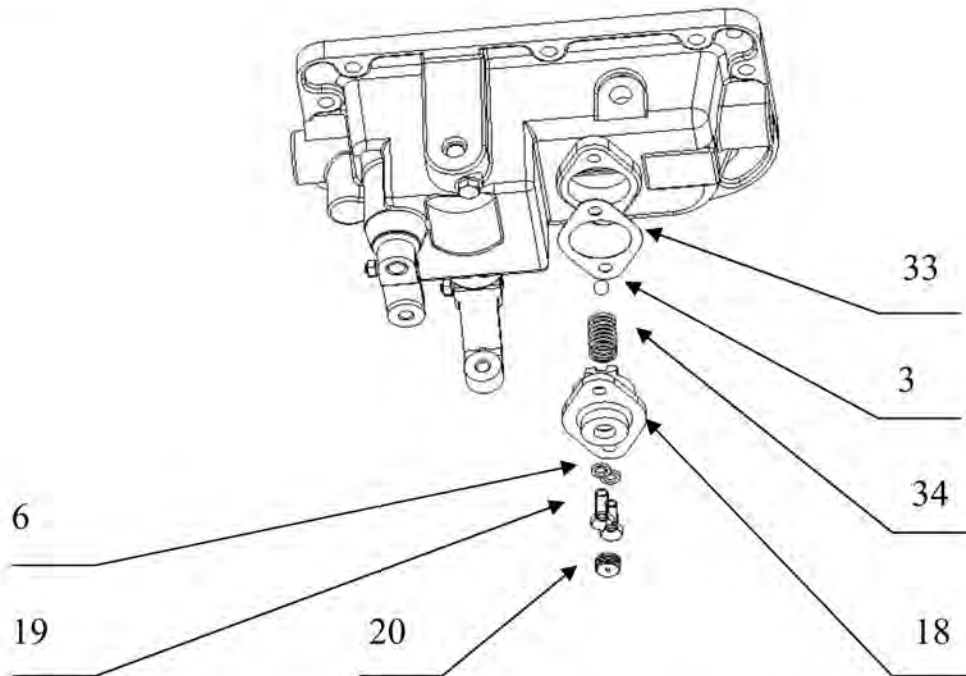




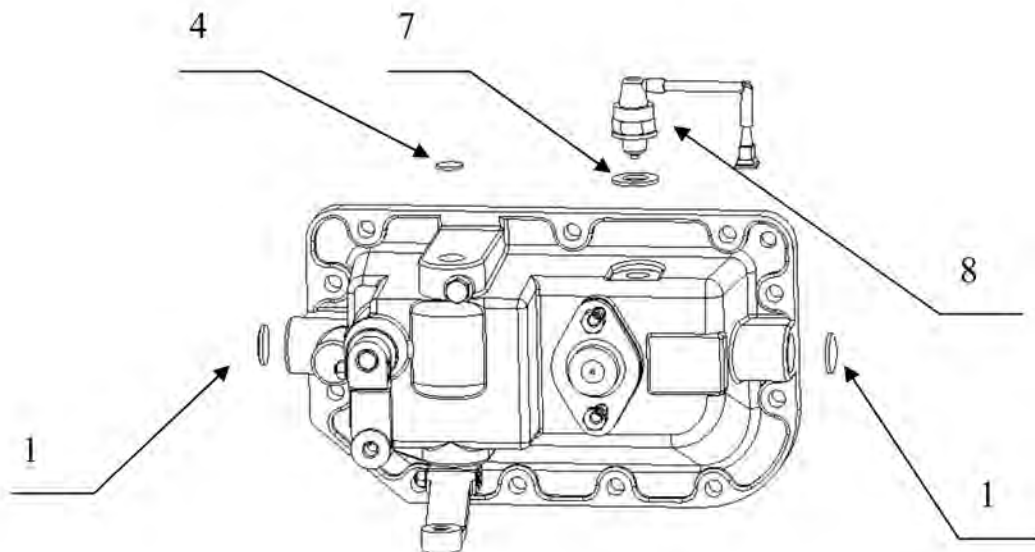
4. Turn the part 17 in place and then install the part 13. After that be sure the gear shift pin (13) not higher than the interlocking board (15) . Then turn the part 17 and 29 in place and install the part 16 finally.



5. Install the parts 33, 18, 6, 19, 3, 34, 20 in turn. Tightening torque of bolt M8 is 25-35Nm.



6. Install the parts 1 and 4 and then coat their assembly gap with gelatin (495).
Install the parts 7 and 8. Tightening torque of bolt M14×1.5 is 30-45Nm.



※ The side cover sub assembly Parts List

NO.	Code Name	Part Name	Qty.	Specification
1	Q72124	Expansion plug	2	
2	255-1702035	Spring	1	
3	GB308	Steel ball	2	3/8 "
4	Q72116	Patch	1	
5	255A-1702030	Positioning bolt	1	
6	GB93	Washer	3	8
7	Q72314T8	Papery washer	1	
8	255-1702050	Switch	1	
9	255A-1702010A	Side cover	1	
10	255-1702021	3 rd & 4 th gear shift fork assembly	1	
11	255A-1702026	Shifting block	1	
12	255-1702020	1 st & 2 nd gear shift fork	1	
13	255-1702031	Gear shift pin	1	
14	255-1702024	5 th and reverse gear shift fork	1	
15	255-1702030	Interlocking board	1	
16	GB879	Pin	1	5 × 30
17	255A-1702015	Fork shaft	1	
18	255-1702032	Retainer	1	
19	GB5783	Bolt	2	M8 × 22-8.8

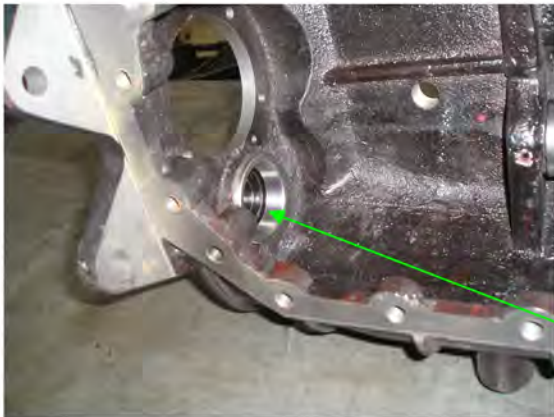
20	255-1702036	Plug	1	
21	255A-1702130	Spring	1	
22	255A-1702131	Shifting rockers stop pin	1	
23	GB9877.1	Oil seal	1	FB163006
24	255A-1702124	Shifting rockers	1	
25	GB93	Washer	2	6
26	GB6170	Nut	2	M6
27	255A-1702127	Shift gear shaft	1	
28	255A-1702128	Stop pin	1	
29	255A-1702123	Gear selection rocker	1	
30	255A-1702132	Gasket	1	
31	GB9877.1	Oil seal	1	FB122406
32	255A-1702120	Selector shaft assembly	1	
33	255-1702033	Retainer gasket	1	
34	255-1702034	Spring	1	
35	255A-1702125	Gear shifting block	1	
36	255A-1702129	Pillow	1	
37	255-1702023	3 rd & 4 th gear shift fork	1	
38	255-1702025	3 rd & 4 th gear shift fork lever	1	
39	GB879	Pin	1	5×20

Commentary: The part of the serial number 1 and 4 requires spread sealant to prevent petrol dripping.

TRANSMISSION SET FINAL ASSEMBLY

1 The countershaft correlation parts assembly.

1.1 Mount the front bearing external ring into the countershaft frontal pore with sleeve and hand hammer.



Front bearing external ring

1.2 First mount rolling bearing on the countershaft sub assembly, second mount the fifth gear on the countershaft sub assembly, and then install the whole into the shell.



1.3 Install two halves snap ring of the mid-fifth gear, after that make it rang on the fifth gear flute.



Check ring

1.4 Install the countershaft rear bearing.



Rolling bearing

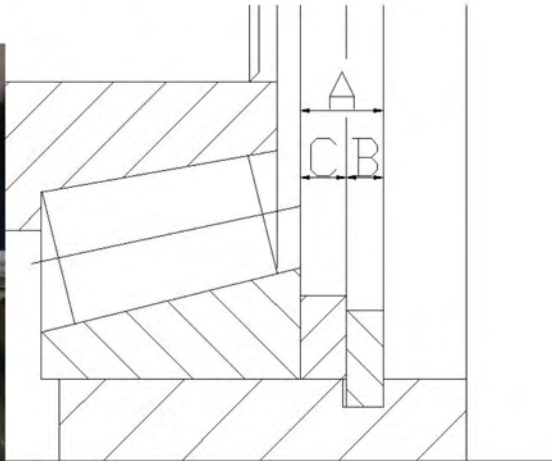
1.5 Detect the size A form bearing external ring end face to snap ring trough outer end with measuring implement. Detect snap ring thickness size B with the calipers.

Technical requirements: $\text{Size A} - \text{Size B} - (0.08 - 0.15) = \text{Shim size C}$.



Ring riser

Retainer ring

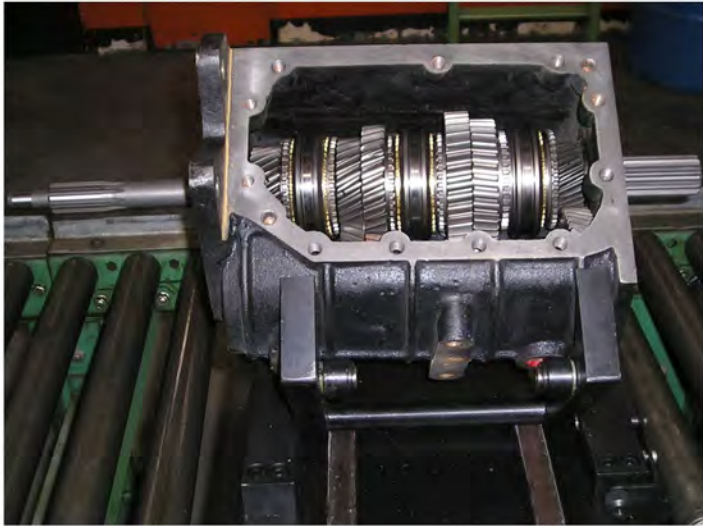


1.6 Mount: “O” Ring Seal with trial run oil on the midship shaft bearing cover, then install it with aluminum bar and hand hammer.

2 Put the input shaft sub assembly into the housing.



3 Put the output shaft sub assembly into the housing.



4 Install output shaft bearing.



Thrust ring

Bearing

Snap ring

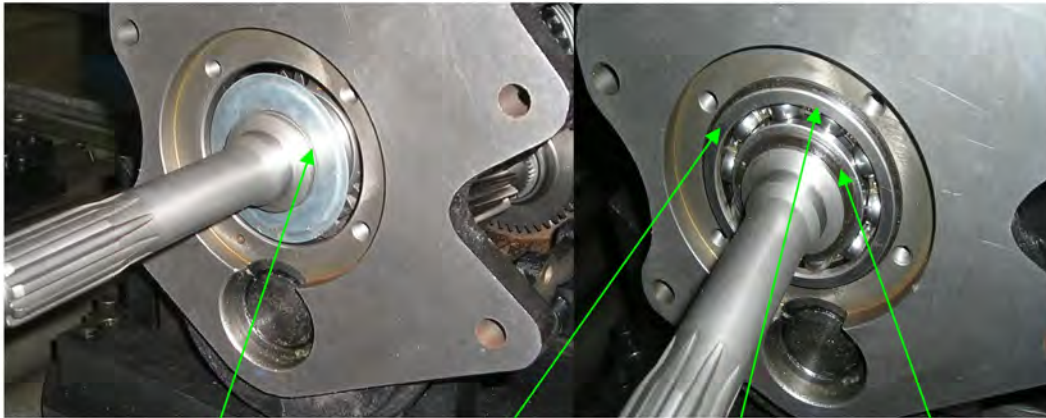
Bearing shim

4.1 Install bearing thrust ring, mount bearing in the housing with hammer and sleeve.

4.2 Install bearing shim on the output shaft.

4.3 Fasten snap ring on.

5 Install input shaft bearing.



Oil thrower

Snap ring

Bearing

Thrust ring

5.1 Install bearing oil thrower on input shaft, convexity outward.

5.2 Install input shaft bearing collar, fasten bearing on with hand hammer and sleeve.

5.3 Install input shaft bearing thrust ring with taper sleeve, sleeve and hand hammer.

6 Fasten the input shaft bearing cap on.



Paper gasket

Oil gallery

Wash

Bolt

Bearing cap

6.1 Press the oil seal into the bearing cap.

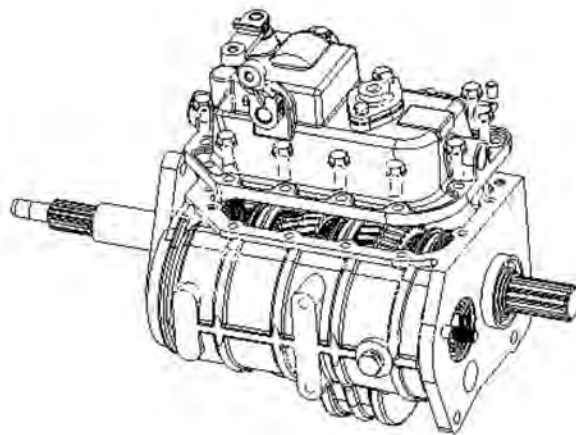
6.2 Spread 598 sealant at input shaft bearing hole and bolt hole of case body compartment, notice that oil gallery can't be build up.

6.3 Fasten paper gasket on, and make oil gallery alignment.

6.4 Install input shaft bearing cap, bolt and washer with sleeve and wound trigger, first of all bolts must be screwed down on the cross, watch out for alignment oil gallery.

7 Mount the side cover assembly in the case body.

Notice: Smear sealant at the interface of the shell and side cover, sealant must be uniformity and series. All bolts must be screwed down on the cross.



TRANSMISSION DISMANTLEMENT

1. Take down the input shaft of the transmission case.
 - a. Knock down bolts at the input shaft journal lid;
 - b. Manage to draw the input shaft bearing retainer out;
 - c. Take the paper gasket and the thrust washer down;

- d. Carry the snap ring down;



- e. Pull the input shaft bearing out with a proper bearing puller;



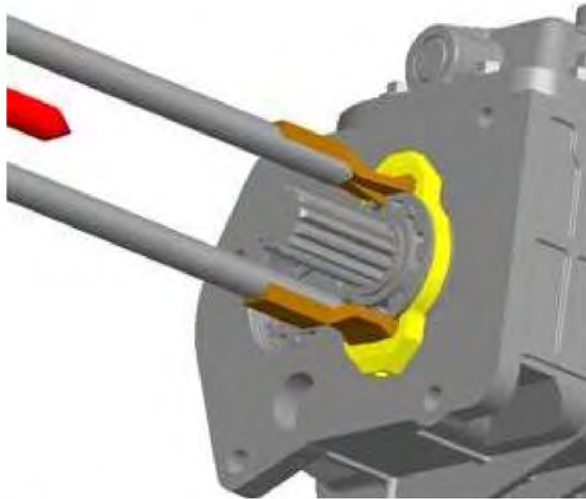
- f. Turn the input shaft and draw the assembly out.

2. Take down the output shaft of the transmission case.

- a. Take the thrust washer down;

- b. Pull the output shaft bearing out with a proper bearing puller;





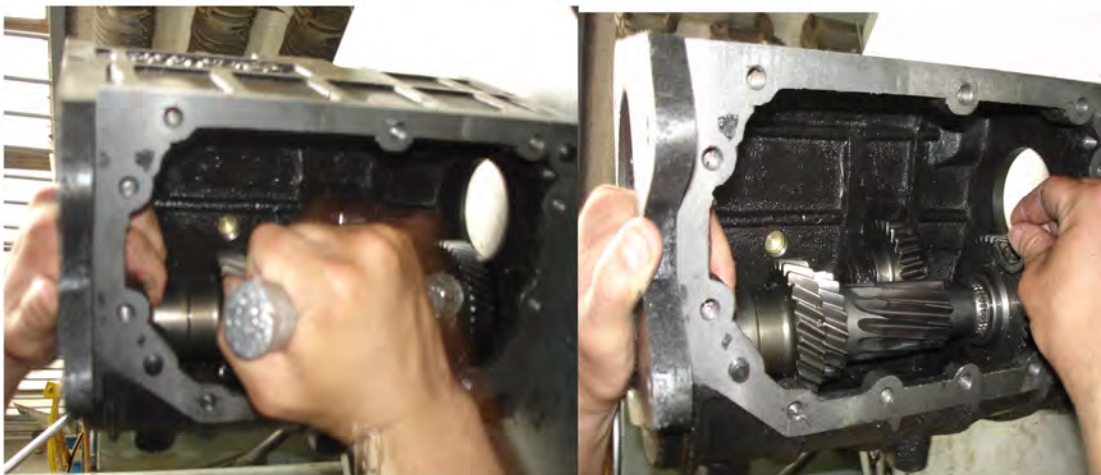
c. Take the output shaft assembly out.

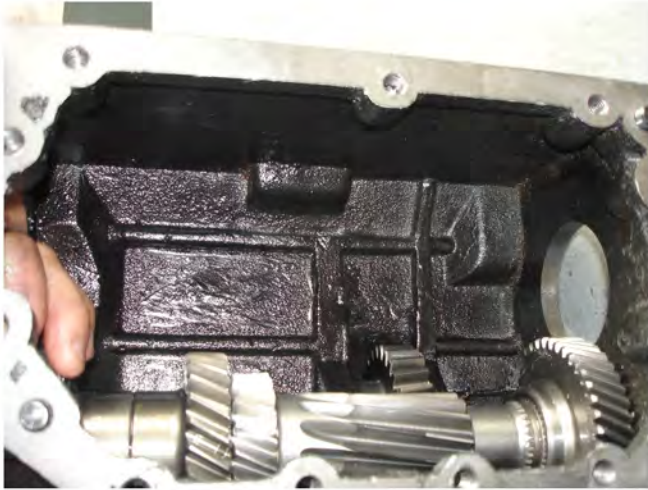
3. Take down the countershaft.

a. Remove countershaft posterior retainer ring and spacer ;



b. Withstand countershaft gudgeon, knock countershaft fifth speed gear backwards with instrument, carry snap ring down;





c. Push back countershaft, disengage countershaft posterior mandrel bear external ring from selector rod housing shell;



d. Take countershaft assembly out.



The rest of dismantlement course refer to transmission assembly view.

TROUBLESHOOTING

1. Gear disorder

1.1 Engine stop working is result from the reverse gear not off the place completely when releasing the clutch pedal if shifting the reverse gear to forwards gear. The reason is that some cracks happen at the reverse fork arms or the damage of synchronizer sprung engender slipper broke off. So we should be changed good ones then.

1.2 All the gears not engaged or removed successfully is that the shifter lever end is out of the place from the slot.

2. Gear jumping out

2.1 It is probably caused by over wear-out and deformation of fork.

2.2 When synchronizer ring is spoiled, face wear appear abrasion or spoil, change a new one.

3. Noise

3.1 The driven gears' damage, even break, can result in strong knocking noise. Check it up and changed. Also make sure to clean up the remaining metal fractions inside the housing.

3.2 Bearing traumata here should change homologous bearing.

3.3 Lubricating oil low on fuel, here in response to charging-up named lubricating oil.

4. Oil leakages

Oil seal spoil, then should change oil seal.

AFTERSERVICE

Transmission assembly rule using 75W-85(SK G-F) GL-4 lubricating oil, transmission case rule 1.7 liter fuel charge, (in defect of graduate measure, should added the oil below down the filling hole for appropriate). After product put into service, every driving 40000 km or driving a year need oil change.

TRANSMISSION EASILY-WORE PARTS LIST:

NO.	Part Name	Code Name	Qty. / 1000
1	Rolling bearing	255-1701106	20
2	Needle bearing	255-1701133	20
3	Needle bearing K455027	GB5846-86	20
4	Needle bearing KK283435	GB5846-86	20
5	Rolling bearing L30205	GB/T4648-96	20
6	Rolling bearing 6209N	GB/T276-94	20
7	Rolling bearing 30206	GB/T297-94	20
8	Rolling bearing	255-1701153	20
9	Synchronizer spring	255-1701145	200
10	Synchronizer insert	255-1701144	200
11	Synchronizer ring	255-1701143	200
12	Snap ring-input shaft	255-1701034	50
13	Snap ring-the 3 rd and 4 th speed	255-1701162	50
14	Snap ring	255-1701122	100
15	Snap ring-output shaft roller	255-1701156	50
16	O-oil seal-input shaft	GB3452.1-92	100
17	Oil seal	255-1701043	100
18	Reverse gear lamp switch	255-1702050	50
19	Oil seal FB122406	GB9877.1	80
20	Oil seal FB163006	GB9877.1	80