

Instruction Manual

SHIMPO CORONET Reducer

model **ER** series

Frame A~NG

No. **E-ER-I**-71220-F

Manufactured by

NIDEC-SHIMPO CORPORATION

1 Terada, Kohtari, Nagaokakyo-city, Kyoto, Japan

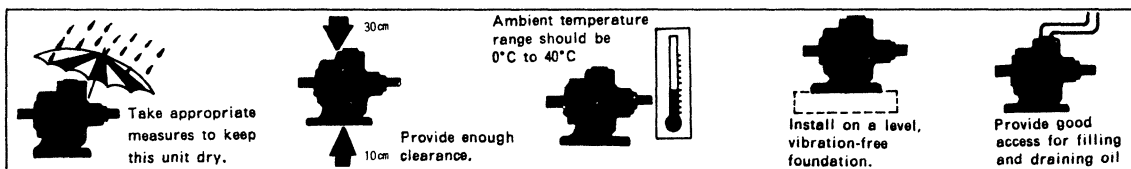
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1 INSTALLATION

1-1 Location

1. Install in a clean, dry place with good ventilation.
 - * If you intend to install it outdoors or where it will be subject to excessive dust or moisture, contact us for details.
2. Operating temperature range is 0°C to 40°C (32°F to 104°F).
 - * Contact us if you intend to use this unit in excessively high or low temperature environments.
3. Securely bolt this unit to a rigid, vibration-free frame.
 - * The grease-lubricated units (Frame size A, B, & C) have no restrictions on the mounting angle.
 - * Horizontal types should be installed horizontally. Install vertical types (shaft up and shaft down) vertically, or lubrication problems will result. Contact us for slanted installations.
4. Installation place should be convenient for maintenance and inspection.
 - * Install this unit approximately 10cm (4") from the floor and provide a top clearance of 30cm (12") for easy access for filling and draining oil.
 - * When this unit is installed inside a machine, position it so that oil level can be easily checked, oil can be added, and changed using pipes.

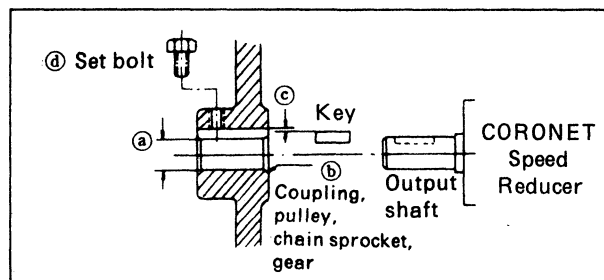
● Installation



1-2 Connections

Note that in single stage reducers, input shaft and output shaft rotate in opposite directions.

1. When connecting, do not apply impacts or excessive thrust loads to output and input shafts. If driven forcibly, internal bearings can be damaged.



(a) Chamfer the bore to approximately 1mm (0.04").

(b) Secure the key with a set bolt.

Note: The coupling, pulley, chain sprocket, gear, etc. must have an effective diameter five times larger than that of the output (input) shaft diameter.

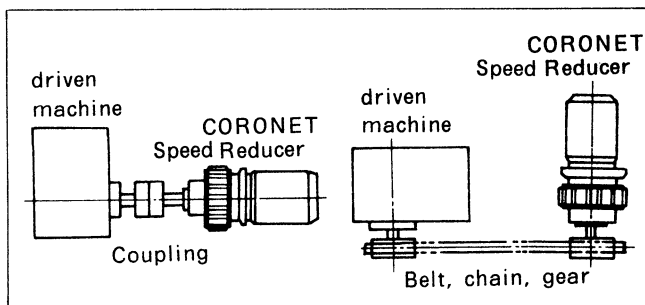
Shaft ends must be protected against impacts, vibrations and excessive thrust loads transmitted from the machine.

(Refer to catalog for allowable shaft loads.)

2. Perform centering properly for connections.

* For connection with coupling.

Install your RINGCONE Metallic traction drive so that the center of its shaft is perfectly aligned with the center of the shaft of the driven machine.



* For connection with pulley, chain sprocket, gear, etc.

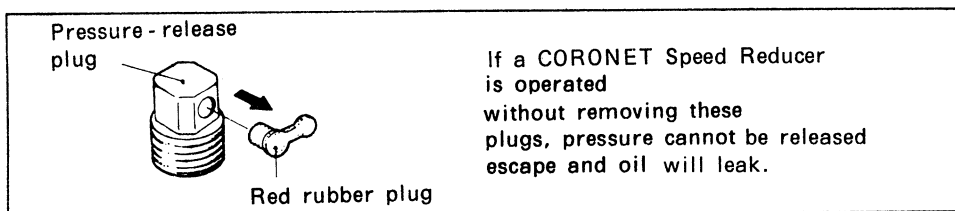
Set the shafts of your RINGCONE Metallic traction drive and the shaft of the driven machine so that they are perfectly parallel with one another.

2. OPERATION

2-1 Before operation

1. Unless otherwise specified, CORONET Speed Reducers are shipped with the lubricating oil filled. Do not add any oil. (Check that the oil level is at the center of oil gauge before operation.)

* Remove the red rubber pressure-release plug from the breather cap at the oil inlet plug before operation.



2. Check that electrical wiring is proper.
3. Check that connection of the driven machine is proper (fitting, centering, etc.).

2-2 During operation

1. Operate the trial run without load.
2. Do not stop or start the unit of larger inertia rapidly.
3. Both forward and reverse rotations can be possible.
 - Single reduction unit: Rotation direction of output shaft is opposite to that of input shaft.
 - Double reduction unit: Rotation direction of output shaft is the same as that of input shaft.
4. Pay careful attention not to overload the unit. The amperage shall be checked and controlled within the motor rated amperage.
5. In the following cases, stop operation for inspection.

Conditions	Possible causes
<ul style="list-style-type: none"> • When temperature suddenly rises. • When noise suddenly becomes louder. • When revolution suddenly becomes unstable. • When other faults or defects are found. 	<ul style="list-style-type: none"> • The unit is overloaded. • Lubricating oil is excessive, insufficient or deteriorated, or different grade of oil is used. • Bearings and sliding surfaces are damaged. • Connecting conditions with driven machine are improper.

* For details, refer to [5] Troubleshooting.

3. LUBRICATING OILS

3-1 Approved lubricating oils

Lubricating oils play an important role for proper operation and extended service life. Therefore, use only the specified lubricating oils. (Never use machine oil or engine oil.)

* Different lubricating oils are used for speed change and speed reduction sections.

Lubrication system	Grease	Oil
Frame Size	Frame Sizes A,B&C	Frame Sizes A thru NG
Classification	NLGI-No. 0 -EP	JIS K2219 gear oil No.2 ISO VG 220
Mobil	—	Mobil Gear 630
Exxon	—	Spartan EP 220
Shell	Darina EP No. 0	Omala Oil 220

Notes: * For low temperature (0°C to -30°C) and high temperature (about 40°C and above) operation, special lubricating oils are required. Contact us for details.

* For Zero backlash type; Frame-B, & C, confirm different kinds of lubricant oils in the attached detail information.

3-2 Replacement of lubricating oil

* When replacing lubricating oil, completely drain old oil and refill with specified quantity of new oil.

Lubrication system	Grease	Oil
Interval	Every 20,000 hours or 4~5 years	After 3,000 hours or yearly

Note: If deteriorated oil is used, proper lubricating effect will not be obtained and increased wear will result.

3-3 Filling and draining lubricating oil

* Never mix oils of different kinds.

If mixed, oil properties may change and result in improper lubrication.

* Oil leakage can likewise lead to problems. Wipe away any oil spills after filling or draining.

[For Oil Lubrication System]

* To fill the oil, remove the level plug and the fill plug. Refill through the fill plug opening until oil overflows at the level plug opening. Be sure unit is level when it is being refilled. Vertical shaft units must be in operating position when being refilled.

[For Grease Lubrication System]

* Grease lubrication system (A.B.C. frame seldom needs additional grease between replacement intervals. When replacing grease, disassemble the unit for overhaul before filling with grease. (As a rule overhaul the unit every four or five years.)

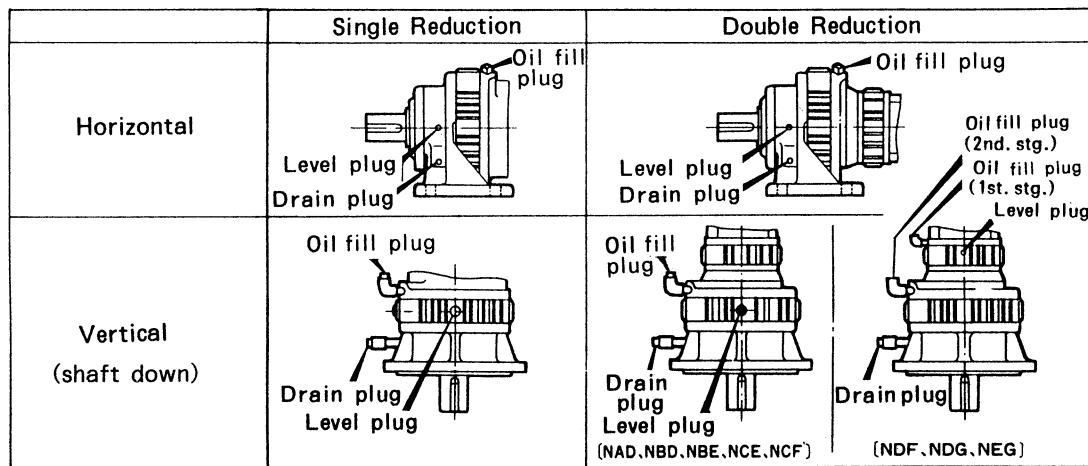
3-4 Oil level and plugs for filling and draining

Frame Sizes	Quantity	
	Horizontal	Vertical
A	Grease	Grease
B		
C		
D	Oil 0.9 l	Oil 1.5 l
NE	Oil 1.8 l	Oil 2.4 l
NF	Oil 3.2 l	Oil 4.3 l
NG	Oil 6.5 l	Oil 7.0 l

* Vertical...shaft down

Frame Sizes	Horizontal		Vertical (shaft down)	
	1st. stg.	2nd. stg.	1st. stg.	2nd. stg.
AA	Grease		Grease	
NAB				
NAC				
NAD	Oil 1.2 l	Grease	Oil 1.5 l	
NBD	Oil 1.2 l		Oil 1.5 l	
NBE	Oil 2.2 l		Oil 2.4 l	
NCE	Oil 2.4 l		Oil 2.4 l	
NCF	Oil 3.8 l		Oil 4.3 l	
NDF	Oil 4.1 l		Oil 7.8 l	
NDG	Oil 8.0 l		Oil 14.5 l	
NEG	Oil 8.8 l		Oil 15.4 l	

[For Oil Lubrication System]



4. PERIODICAL INSPECTION

4-1 Daily inspection

1. Check for abnormally high temperatures of bodycase during operation.
* Proper temperature is the ambient temperature plus 50°C.
2. Check for abnormal noise in bearing, transmission area, etc.
3. Check for abnormal vibration.
* If any abnormality is found, immediately stop the unit and inspect. If problem cannot be corrected, contact us.
4. Check for oil leakage from oil seal, O-ring, oil gauge, oil fill plug, drain plug, etc. of output shaft area.
* If oil leakage is found, replace related parts or contact us.

4-2 Periodical inspection (every three months)

1. Check for excessive overload.
2. Check for loose set bolts on pulley, sprocket and unit.
3. Check for electrical system defects.
4. Check power transmitting components, bearings or oil seals for excessive wear.
* If abnormal sounds are generated, immediately stop the unit and disassemble it to inspect. If problem cannot be corrected, contact us.
5. Lubricating oil change
Check oil level and oil quality. Determine if oil should be changed.

5. TROUBLESHOOTING

	Problem	Possible cause	Remedy	
When operated with load	Unit does not rotate	Blown fuse	Excessive load Inspect and decrease load to specified level	
		Overload	Insufficient fuse capacity	Replace with the fuse of rated capacity
			Insufficient capacity of CORONET reducer	Recheck model and type
		Fail of driven machine and/or connecting mechanism	Determine the cause and adjust or repair	
	Unit rotates	Abnormal temperature rise (overheating)	Low voltage	Contact power company
			Excessive load	Inspect and decrease load to specified level
			High oil viscosity	Replace with specified or equivalent oil
	R.P.M variation	Excessive, insufficient or deteriorated oil	Replace with specified or equivalent oil (specified quantity)	
		Howling sound	Faulty connection with driven machine	Determine the cause and adjust or repair
			High oil viscosity	Replace with specified or equivalent oil
Overload			Inspect and decrease load to specified level	
Unit rotates	Howling sound	Worn driving surface	Replace parts	
		Low electric power	Contact power company	
		Running with missing phase (the three phases are functioning as one phase)	Inspect electric wires and/or contact power company	
When operated with no load	Unit does not rotate (start)	Blown fuse	Adjust contact of terminal or replace fuse	
		Defective switch contact	Adjust contact area	
		Disconnected stator coil	Return to dealer for repair	
		Disconnected connecting wire	Inspect disconnection and replace	
		Damaged bearing	Replace bearing	
	Unit rotates (starts)	Revolution does not increase	Disconnected connecting wire in one phase	Replace with complete set
			Incorrect wiring connections	Reverse two of the three power leads
			Faulty switch contact (governor switch on single phase)	Adjust contact portion
			Short circuit of one phase of stator coil	Return to dealer for repair
			Contact of rotor and stator	Replace bearing or return to dealer for repair
Unit rotates (starts)	Howling sound	High oil viscosity	Replace with specified or equivalent oil	
		Worn driving surface	Replace parts	
Oil leakage	Howling sound	Damaged bearing	Replace bearing	
		Damaged driving surface	Replace parts	
Oil leakage	Oil leakage	Defective O-ring	Replace deformed or cracked O-ring	
		Defective oil seal	Replace hardened or cracked oil seal	
		Loose set bolt	Tighten bolt	
		Excessive lubricating oil	Adjust to the specified quantity	
		Lack of packing	Packing	
Oil leakage	Oil leakage	Check if pressure release plug has been left in	Remove plug	

6. DISASSEMBLY & REASSEMBLY

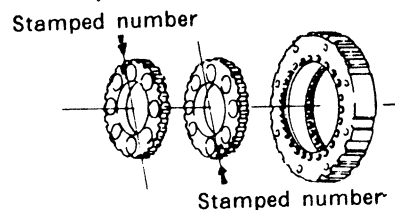
After prolonged service, the unit may wear to the point that it requires rebuilding. Disassemble as follow referring to the exploded views.

6-1 Disassembly

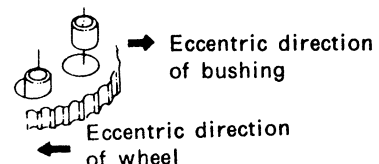
- ▶ For frame A, B and C
 1. Loosen Set bolts (331), and remove Base (301).
 2. Remove Output shaft assembly (306).
 3. Remove Wheel (311), Bushing (310), Eccentric roller bearing (313), Spacer (312) on output shaft side.
 4. Remove Wheel (311), Bushing (310), Eccentric roller bearing (313) on input shaft side.
 5. Remove Internal pin housing (320) from input shaft section.
 6. For model ERMK ; Remove Motor flange (352) from Motor (351).
For model ERK, ER ; Remove M-shaft (353), Input shaft (338) from Motor flange (352), input Shaft holder (328).
- ▶ For frame D, NE, NF and NG
 1. Drain oil thoroughly
 2. Remove Bearing cover (302)
 3. Remove Snap ring (303) of bearing 3A
 4. Remove Base (301)
 5. Remove bolt of the Carrier pin (317) and release Output shaft (306),
 6. Remove Wheel (311), Bushing (310), Eccentric roller bearing (313), Spacer (312) on the output shaft.
 7. Remove Wheel (311), Bushing (310), Eccentric roller bearing (313), Spacer (312) on the input shaft.
 8. Remove Holder (318), and remove Internal pin housing (320) from input shaft section.
 9. For model ERMK ; Remove Motor flange (352) from Motor (351).

6-2 Reassembly

- ▶ Reassembly should be done in the reverse order of disassembly.
 1. Use packing between joint surfaces of internal and between gear and variator. Replace the packings with new one in the event of deformed or scarred.
 2. Two wheels are stamped with frame symbols and numbers. Set these wheels so that the stamped numbers are at the top, and then move one wheel by 180° and assembly as shown.

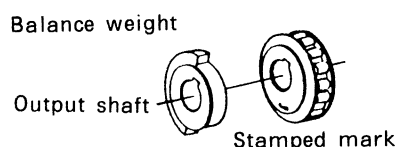


3. Move the bushing away from the eccentric direction as shown. (Frame A, B, and C only)

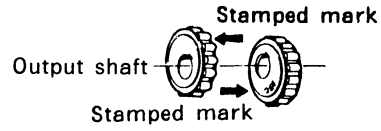


4. Check the following notes when assembling eccentric roller bearing.

For Frame A ; The stamped mark on the eccentric roller bearing should be on the output shaft and the balance weight should be assembled as shown in the fig. below.



For frame B~NF : Eccentricity becomes 180° by setting one eccentric roller bearing with its stamped mark upwards and the other with its stamped mark downwards as shown.



5. Lubricate internal pin housing with specified quantity of grease. (Frame A, B and C only)
6. Assemble Internal pin housing, placing the name plate on the internal pin housing and the grease inlet plug and air release plug of the input bracket are in the same direction.
7. Assemble roller bearing into output bracket as the collar of outer lace should be on the output shaft side.



(DOUBLE STAGE REDUCTION) EXPLODED DIAGRAM

■ (Double reduction) Bearing nominal number list

Frame No.	3A		3B		3C		3G		3D	
	1/11	Over1/17	1/11	Over1/17	1/11	Over1/17	1/11	Over1/17	1/11	Over1/17
A	6206	6208	NF15212	IR121512	IR121512	IR121512	---	---	---	---
NB	6307	6208	NF15212	IR121512	IR121512	IR121512	---	---	---	---
NC	6309	6212	NF2204	IR172016	IR172016	IR172016	---	---	---	---
ND	6213NR	---	NF2305	---	---	---	6010	6210	---	---
NE	6315NR	---	NF2305	---	---	---	---	6015	---	---
NF	6315NR	---	NF2306	---	---	---	---	6216	---	---
NG	23126BNR	---	---	NJ 311	---	---	---	6220	---	---

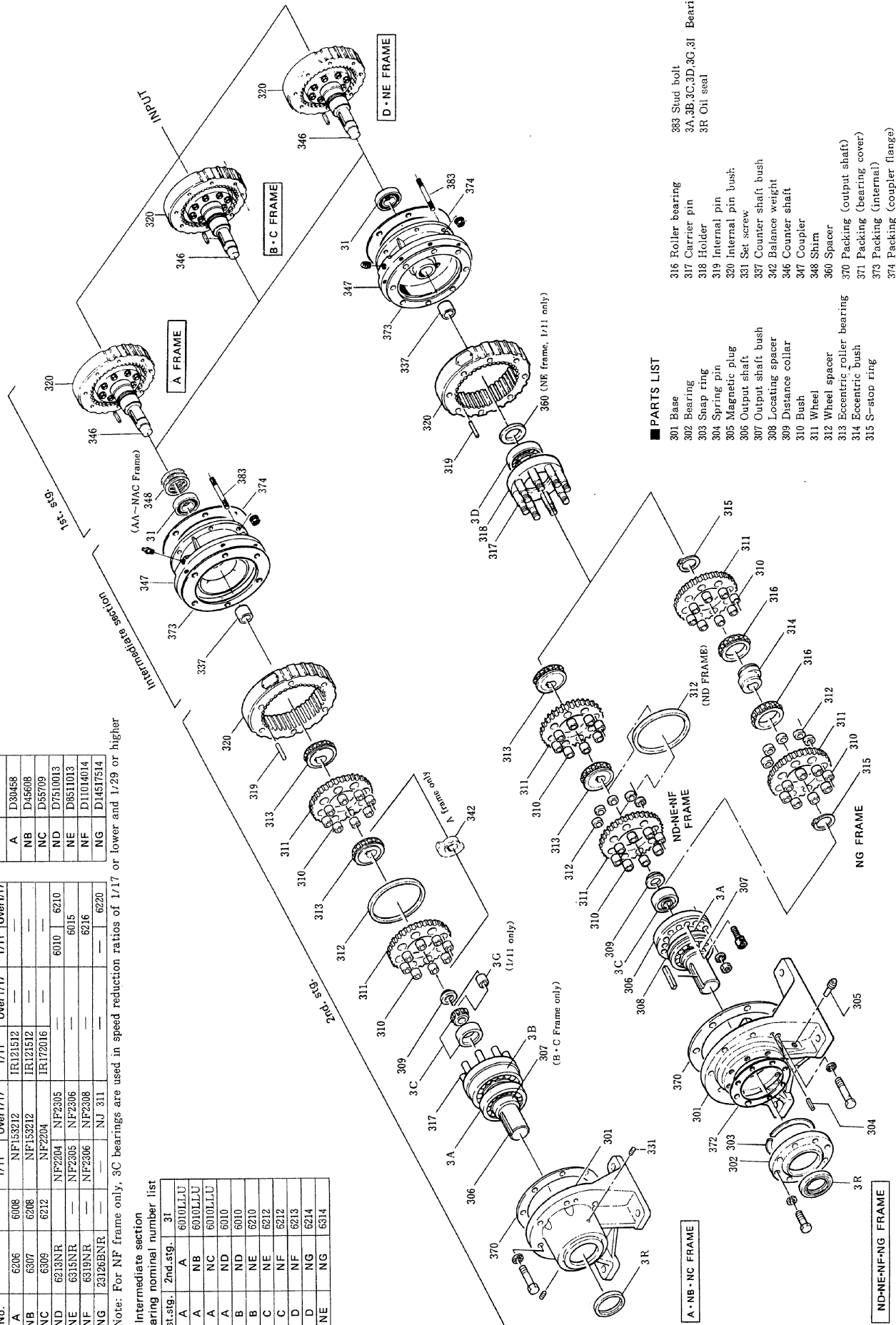
Oil seal nominal number list

Frame	3R
A	D30458
NB	D46608
NC	D55709
ND	D7510013
NE	D8511013
NF	D11014014
NG	D14517514

Note: For NP frame only, 3C bearings are used in speed reduction ratios of 1/17 or lower and 1/29 or higher

■ Intermediate section

Bearing nominal number list		31
1st.stg.	2nd.stg.	
A	A	6010LLU
A	NB	6010LLU
A	NC	6010LLU
A	ND	6010
B	ND	6010
B	NE	6210
C	NE	6212
D	NF	6212
D	NF	6213
D	NG	6214
NE	NG	6314



■ PARTS LIST

- 301 Base
- 302 Bearing
- 303 Snap ring
- 304 Spring pin
- 305 Magnetic plug
- 306 Output shaft
- 307 Output shaft bush
- 308 Locating spacer
- 309 Distance collar
- 310 Bush
- 311 Wheel
- 312 Wheel spacer
- 313 Eccentric roller bearing
- 314 Eccentric bush
- 315 S-stop ring
- 316 Roller bearing
- 317 Carrier pin
- 318 Holder
- 319 Internal pin
- 320 Internal pin bush
- 331 Set screw
- 337 Counter shaft bush
- 342 Balance weight
- 346 Coupler shaft
- 347 Coupler
- 348 Shim
- 360 Spacer
- 370 Packing (output shaft)
- 371 Packing (bearing cover)
- 373 Packing (internal)
- 374 Packing (coupler flange)
- 383 Stud bolt
- 3A, 3B, 3C, 3D, 3G, 3I Bearing
- 3R Oil seal