Parts Replacement Manual for

No. 189 Reducer Winch Drive / 0163
No. 190 Reducer Winch Drive / W5000
No. 191 Reducer Winch Drive / W1400
Instruction Manual

These instructions must be read thoroughly before installation or operation. This instruction manual was accurate at the time of printing. Please see **dodgeindustrial.com** for updated instruction manuals.

INITIAL ASSEMBLY

The reducer is shipped complete except for the following parts to be assembled by the customer. Brake housing (54) brake housing seal (56), brake housing excluder seal (58), and brake housing hardware (38 & 39). These parts are to be installed as shown in assembly drawing.

The air vent elbow, air vent, and hex bushing are to be installed in place of the pipe plug located nearest the lifting bracket.

REPLACEMENT OF PARTS

Using tools normally found in a maintenance department, a No. 189, No. 190 or No. 191 Reducer can be disassembled and reassembled by careful attention to the instructions following.

Cleanliness is very important to prevent the introduction of dirt into the bearings and other parts of the reducer. A tank of clean solvent, an arbor press and equipment for heating bearings and gears should be available for shrinking these parts on shafts.

Considerable care should be exercised during disassembly and reassembly of oil seals to avoid damage to contact surfaces of seals.

WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Dodge® nor are the responsibility of Dodge. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

The keyseat in the input shaft (40 on #189, #190, #191) should be covered with tape or paper before disassembly or reassembly. Also be careful to remove any burrs or nicks on surfaces of the input shaft (40 on #189, #190, #191) or output shaft (72 on #189, and 74 on #190, #191) before disassembly or reassembly.

ORDERING PARTS

When ordering parts for reducer specify reducer size number, part name, part number reference number and quantity.

It is strongly recommended that when a pinion or gear is replaced, the mating gear or pinion also be replaced.

If the large gear (73 on #189, #191, 75 on #190) on the output shaft (72 on #189, #191, 74 on #190) must be replaced, it is recommended that an output shaft assembly of a gear assembled on a shaft be ordered to insure undamaged surfaces on the output shaft (72 on #189, #191) where the oil seals rub. However, if it is desired to use the old output shaft, press the gear and bearing off and carefully examine the rubbing surfaces under the oil seal for possible scratching or other damage resulting from the pressing operation. To prevent oil leakage at the oil seals, the smooth surface of the output shaft (72 on #189, #191, 74 on #190) must not be damaged.

If any parts must be pressed from a shaft, you should do so before ordering parts to make sure that none of the bearings or other parts are damaged in removal.

Because old seals and housing gasket may be damaged in disassembly, it is advisable to order replacements for these parts.

If replacing a bearing or a shaft, it is advisable to order a set of shims for adjustment of bearings on the shaft assembly. If replacing a housing, a set of shims should be ordered for each shaft assembly because the adjustment of the bearing on each shaft assembly is affected.

DISASSEMBLY

1. Remove all bolts from housing. Drive dowel pins into right hand half of housing (as shown in the drawing). Open housing evening to prevent damage to parts inside.
2. Lift shaft, gear, and bearing assemblies from housing.
3. Remove seals, seal carriers and bearing cups from housing.

REASSEMBLY

NOTE: It is recommended that the heating of the following gears and bearings should be done in a hot oil tank only.

1. Output Shaft Assembly: Heat gear (73 on #189 and #191, 75 on #190) to 325 ºF to 350 ºF to shrink on output shaft (72 on #189 and #191, 74 on #190). Heat bearing cones (81 on #190 and #191) to 270 ºF to 290 ºF to shrink on shaft.
2. Countershaft Assembly: Heat gear (61 on #189 and #190, #191) to 325 ºF to 350 ºF and bearing cones (63 on #180, #190 and #191 and 65 on #190 and #191) to 270 ºF to 290 ºF to shrink on shaft (60 on #189, #190 and #191).
3. Input Shaft Assembly: Heat bearing cones (45 on #189 and #191 43 on #190 and #191) to 270 ºF to 290 ºF to shrink on shaft (40 on #189 and #190).
4. Place a .010" shim on output shaft seal carrier (78 on #189 and #191) for right hand half of housing (as shown on drawing). Place a 1/8" diameter bead of Dow Corning RTV732 sealant on the face around the ID of the shim (seal is to be between reducer housing and shim).

NOTE: If too much sealant is used it will run into bearing and too little sealant will result in an ineffective seal.

Install output shaft seal carrier (78 on #189 and #191, 32 on #190) in right hand housing half and torque screws (68 on #189, #190 and #191) to recommended torque shown in Table 1.
For #191 -- Apply sealant to input shaft seal carrier (32) and screws (37). tighten to recommended torque shown in Table 1.
For # 189 -- Install input shaft seal carrier (32 on #189) with gasket (36 on #189) in right hand housing half and torque screws (68 on #189) to recommended torque in Table 1.

Place bearing cups (46, 64, and 82 on #189 and #191, 44, 82, and 70 on #190) in right hand housing half. Make certain the cups (46, 64 and 82 on #189, 44, 82, and 70 on #190) are properly seated in housing. Place housing half on blocks to allow for protruding end of output shaft (72 on #189 and #191, 74 on #190) and input shaft (40 on #189, #190 and #191).

5. Mesh output shaft and countershaft assembly together and place in housing half. Place input shaft (40 on #189, #190 and #191) in position. Make sure rollers are properly seated in bearing cups.
6. Clean housing flange surfaces on both halves, making sure not to nick or scratch flange face. Place a new bead of gasket eliminator on flange face and spread evenly over entire flange leaving no bare spots. Place left half of housing (without covers or carriers installed) in position and draw together evenly to prevent damage to parts. Tighten bolts to the final recommended wrench torque shown in Table 1.

NOTE: If reducer was originally supplied with a housing gasket do not use gasket eliminator. Reorder gasket per part number given in parts list. Place left half of housing (without covers or carriers installed) in position and draw together evenly to prevent damage to parts. Tighten bolts to the final recommended wrench torque shown in Table 1.

7. Place output shaft cover (86 on #189, #191and #190) in position without shims. Install two cap screws (68 on #189, #190 and #191) diametrically opposed making sure they do not bind, then torque to 25 pound-inches. Rotate the shaft a few times to roll in the bearings. Using a feeler gauge or taper gauge check the gap between cover (86 on #189, #190 and #191) and housing moving clockwise from, and next to each cap screw. To determine required shim thickness add .003" to the average of the two gauge readings. Remove the cover (86 on #189, #190 and #191) and install the required shims (84 on #189, #190 and #191).

NOTE: Total shim thickness per carrier or cover should not include more than .009" of plastic shims and each plastic shim should be inserted between two metal shims.

Place a 1/8" diameter bead of Dow Corning RTV732 sealant on the face around the ID of the last shim. Install cover (86 on #189, #190 and #191) in housing, tightening cover screws (68 on #189, #190 and #191) to a recommended wrench torque shown in Table 1. Output shaft (72 on #189 and #191, 74 on #190) should have a recommended axial end play of .0002" to .0012". Measure the axial end play by removing the cover plug (88 on #189, #190 and #191) from the output shaft cover (86 on #189, #190 and #191) and place the probe of a dial indicator through the hole in the cover. With the probe resting on the end of the shaft grasp the exposed end of the shaft and move in and out of reducer.

8. Adjust the countershaft bearing using the same method as in step 7, except to determine the shim thickness required. Add .005" to the average of the gauge readings. Torque cover screws (68 on #189, #190 and #191) to recommended torque shown in Table 1. Axial play is measured in similar manner by removing the countershaft cover plugs (67 on #189, 72 on #190 and 88 on #191) and Reducer Housing. Recommended axial end play should be .001" to .002". After end play is measured install countershaft bearing cover (30 on #189 and #191).
9. Using same procedure as in steps 7 and 8, adjust the input shaft bearings except in determining the required shim thickness add .010" to the average of the two gauge readings. Torque break housing (48 on #191) and cover screws (38, 52 on #189, 52 on #190 and #191) per Table 1. Axial play is again measured in a like manner. Axial recommended play should be .002" to .003".
10. Extreme care should be used in installing seals to avoid damage due to contact with sharp edges of the key seat in the input shaft (40 on #189, #190 and #191) and the output shaft (72 on #189 and #191, 74 on #190). This danger of damage and consequent oil leakage can be decreased by covering the keyseats with paper or tape which can be removed after seals are in place. Chamfer or burr housing bore if end of bore is sharp or rough. Fill cavity between lips of seal with grease. Seals should be pressed or tapped with a soft hammer evenly into place in the housing, applying force only on the outer corner of the seals. A slight oil leakage at the seal may be evident during initial running in but will disappear unless the seals have been damaged.
11. Assembly excluders (58, 59, 80 on #189, #190 and #191) properly in brake housing (48 on #189, #190 and #191) and on the output pinions shaft (72 on #189 and #191) by first applying grease or lubriplate to the contact surface area. The purpose of the excluders is to exclude dust or moisture from getting into the reducer seals.

Table 1 - Bolt Tightening Torque Values		
No. 189 Reducer		
Bolt / Screw Part No.	**Bolt / Screw Size**	**Recommended Torque (lb.-ins.)**
16	3/4" - 10 x 7"	1620
①	3/4" - 10 x 6"	1620
38	1/4" - 20 x 7/8"	200
52	7/16" - 14 x 2-1/2"	600
68	7/16" - 14 x 1-1/4"	600
No. 190 Reducer		
Bolt / Screw Part No.	**Bolt / Screw Size**	**Recommended Torque (lb.-ins.)**
16	3/4" - 10 x 6-1/2"	1620
①	3/4" - 10 x 8"	1620
38	1/4" - 20 x 7/8"	200
52	3/8" - 16 x 1-3/4"	360
68	3/8" - 14 x 1-1/4"	360
No. 191 Reducer		
Bolt / Screw Part No.	**Bolt / Screw Size**	**Recommended Torque (lb.-ins.)**
16	1/2" - 13 x 5-1/2"	900
①	1/2" - 13 x 6-1/2"	900
37	1/4" - 20 x 3/4"	200
38	1/4" - 20 x 7/8"	200
53	3/8" - 16 x 1-3/4"	360
68	3/8" - 16 x 1-1/4"	360

① Not shown on drawing

Lubrication Table Oil Recommendations for Average Operating Conditions					
Ratio and Output RPM	**Room Temp. ° Fahr.**	**Oil**		**Viscosity**	
		S.A.E. No.	**AGMA Lube No.**	**ASTM SUS @ 100 ° F**	**Metric Equiv c St @ 37.8 ° C**
15:1 - Up to 75 RPM	0° thru 100°	40	4	626 to 765	135 to 165
15:1 - 76 RPM and Up	0° thru 100°	30	3	417 to 510	90 to 110

LUBRICATION INSTRUCTIONS

IMPORTANT: Because reducer is shipped without oil, it is necessary to add the proper amount of oil before running. Use a high petroleum base, rust and oxidation inhibited (R & O) gear oil - see table. Follow instruction on reducer nameplate, warning tags and the installation manual.

Under average industrial operating conditions, the lubricant should be changed every 2500 hours of operation or every 12 months, whichever occurs first. Drain reducer and flush with kerosene, clean magnetic drain plug and refill to proper level with new lubricant.

NOTE: Too much oil will cause overheating and too little will result in gear failure. Check oil level regularly.

Under extreme operating conditions, such as rapid rise and fall of temperature, dust, dirt, chemical particles chemical fumes, or oil sump temperatures above 200 ºF, the oil should be changed every 1 to 3 months depending on severity of conditions.

Extreme pressure (EP) lubricants are not recommended for normal operating conditions.

Pour point of lubricant selected should be at least 10 ºF lower than expected minimum ambient starting temperature.

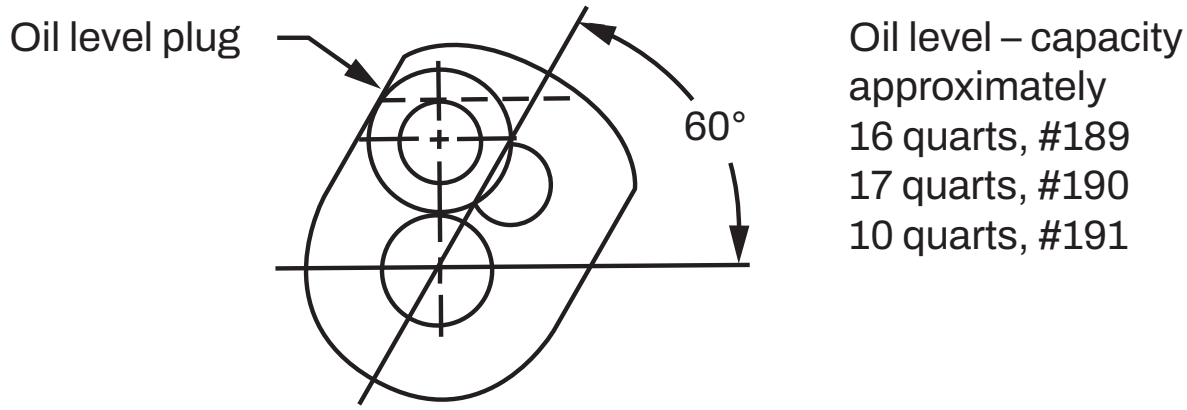
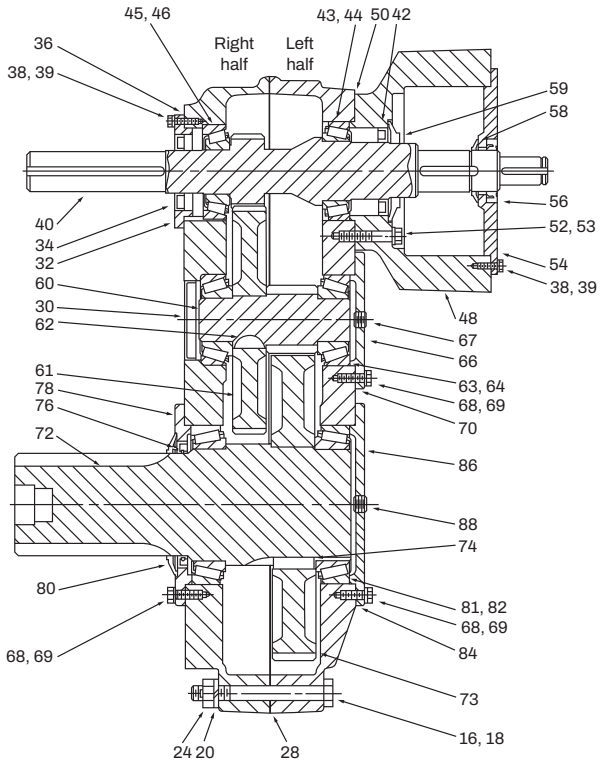


Figure 1 - Oil Level

PARTS FOR NO. 189 REDUCER WINCH DRIVE / 0163
PLACE PICTURE - PARTS NO. 189 HERE

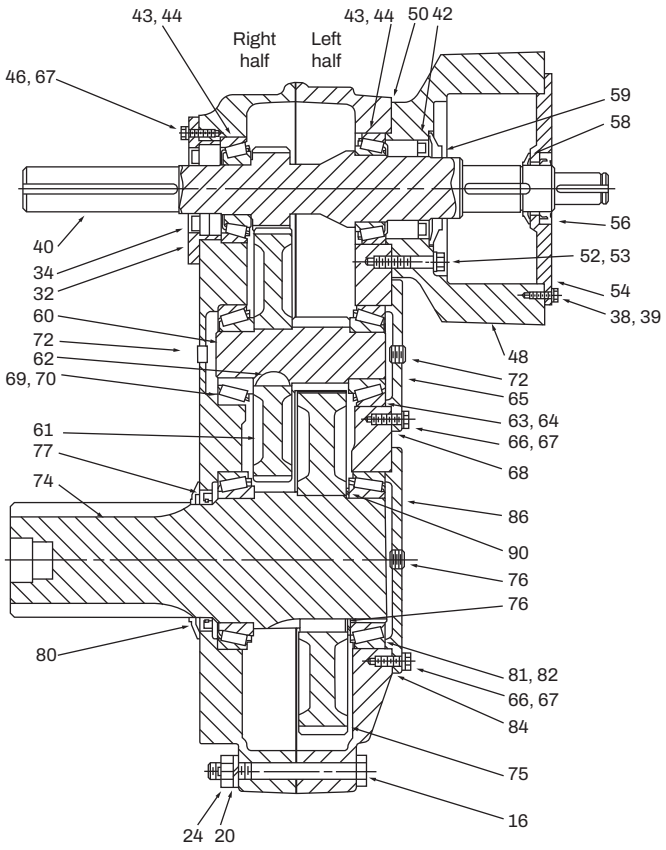


Ref.	Name of part	No. Req'd	Part No.
	Housing Assembly ①	1	⑧
⑤	② Air Vent	1	904287
⑤	② Air Vent Elbow	1	430133
⑤	② Air Vent Bushing	1	430079
16	② Housing Bolt	7	411299
⑤	② Mounting Pad Housing Bolt	1	411300
20	② Lockwasher	8	419136
⑤	② Plain Washer	4	419135
24	② Hex Nut	8	407279
⑤	② Dowel Pin	2	420128
⑤	② Pipe Plug	1	430035
⑤	② Magnetic Plug	1	430064
⑤	② Oil level Gauge	1	021918
⑤	Housing Gasket ④	1	247219
32	Input Shaft Seal Carrier	1	021967
34	Input Shaft Seal - Right Half	1	245211
36	Input Shaft Seal Carrier Gasket	1	246220
38	Carrier and Cover Screws	14	411396
39	Lockwashers	14	419033
40	Input Shaft with Pinion	1	021954
42	Input Shaft Seal	1	021917
	Input Shaft Bearing - Left Half		
43	Cone - 39590 ③	1	402150
44	Cup - 39520 ③	1	403106
	Input Shaft Bearing - Right Half		
45	Cone - 455 ③	1	402088
46	Cup - 452 ③	1	403047
48	Input Shaft Brake Housing	1	021955
50	Reducer Shim Kit	2 sets ⑥	247138
52	Brake Housing Screw	6	411298
53	Lockwasher	6	419139
54	Broke Housing Cover	1	021911
56	Brake Housing Seal	1	021913
58	Brake Housing, Excluder Seal	1	021914
59	Input Excluder Seal	1	021916

Ref.	Name of part	No. Req'd	Part No.
	Countershaft Assembly ①	1	391196
60	② Countershaft with Pinion	1	247002
61	② First Reduction Gear	1	247008
62	② Key	1	247218
	Countershaft Bearing		
63	Cone _ JHM807045 ③	2	402256
64	Cup - JHM807012 ③	2	403053
66	Countershaft Bearing Cover - Left	1	021965
67	Half	1	430033
68	Cover Plug	22	411297
69	Cover Screws	22	419139
	Lockwashers		
	Output Shaft Assembly ①	1	⑦
72	② Output Shaft	1	021957
73	② Output Gear	1	247215
74	② Gear Key	2	443395
76	Output Shaft Seal	1	021961
78	Output Shaft Seal Carrier	1	021962
80	Output Shaft Excluder Seal	1	021958
	Output Shaft Bearing		
81	Cone - 48290 ③	2	402058
82	Cup - 48220 ③	2	403111
86	Output Shaft Cover	1	021963
88	Cover Plug	1	430035
⑤	Lifting Bracket	1	021879

① Includes parts listed immediately below. Housing Assembly also includes two-piece housing.
② These parts make up the assemblies under which they are listed. Housing Assembly also includes two-piece housing.
③ Timken part number
④ For reducers originally supplied with gasket only
⑤ Not shown on drawing
⑥ All shims are in kit
⑦ When no part number is listed, give reference number and/or complete description of part.

PARTS FOR NO. 190 REDUCER WINCH DRIVE / W5000



Ref.	Name of part	No. Req'd	Part No.
	Housing Assembly ①	1	⑦
④	② Air Vent	1	904287
④	② Air Vent Elbow	1	430133
④	② Air Vent Bushing	1	430079
16	② Housing Bolt	10	411503
④	② Mounting Pad Housing Bolt	1	411522
20	② Lockwasher	8	419136
④	② Plain Washer	4	419135
24	② Hex Nut	8	407279
④	② Dowel Pin	2	420128
④	② Pipe Plug	2	430035
④	② Magnetic Plug	1	430064
④	② Oil level Gauge	1	021918
32	Input Shaft Seal Carrier	1	021929
34	Input Shaft Seal - Right Half	1	248211
38	Carrier and Cover Screws	8	411396
39	Lockwashers	8	419033
40	Input Shaft with Pinion	1	021905
42	Input Shaft Seal	1	021917
	Input Shaft Bearing		
43	Cone 563 ③	2	402098
44	Cup 566 ③	2	403072
48	Input Shaft Brake Housing	1	021906
50	Reducer Shim Kit	3 sets ⑤	248111
52	Brake Housing Screw	8	411428
53	Lockwasher	8	419137
54	Broke Housing Cover	1	021911
56	Brake Housing Seal	1	021913
58	Brake Housing, Excluder Seal	1	021914
59	Input Excluder Seal	1	021916
	Countershaft Assembly ①	1	⑦
60	② Countershaft with Pinion	1	248002
61	② First Reduction Gear	1	021921
62	② Key	2	248218

Ref.	Name of part	No. Req'd	Part No.
	Countershaft Bearing - Left Half		
63	Cone _ JH211749 ③	1	402057
64	Cup - JH211710 ③	1	403143
66	Countershaft Bearing Cover - Left Half	1	021927
67	Cover Screws		411427
	Lockwashers		419137
	Countershaft Bearing-Right Half		
69	Cone _ 39585 ③	1	402148
70	Cup - 39520 ③	1	403106
72	Cover Plug	2	430033
	Output Shaft Assembly ①	1	⑥
74	② Output Shaft	1	021908
75	② Output Gear	1	248215
76	② Gear Key	2	
77	Output Shaft Seal	1	021910
80	Output Shaft Excluder Seal	1	021909
	Output Shaft Bearing		
81	Cone ③	2	402242
82	Cup - LM229110 ③	2	403129
86	Output Shaft Cover	1	021919
88	Cover Plug	1	430035
90	Spacer	1	021920
④	Lifting Bracket	1	021789

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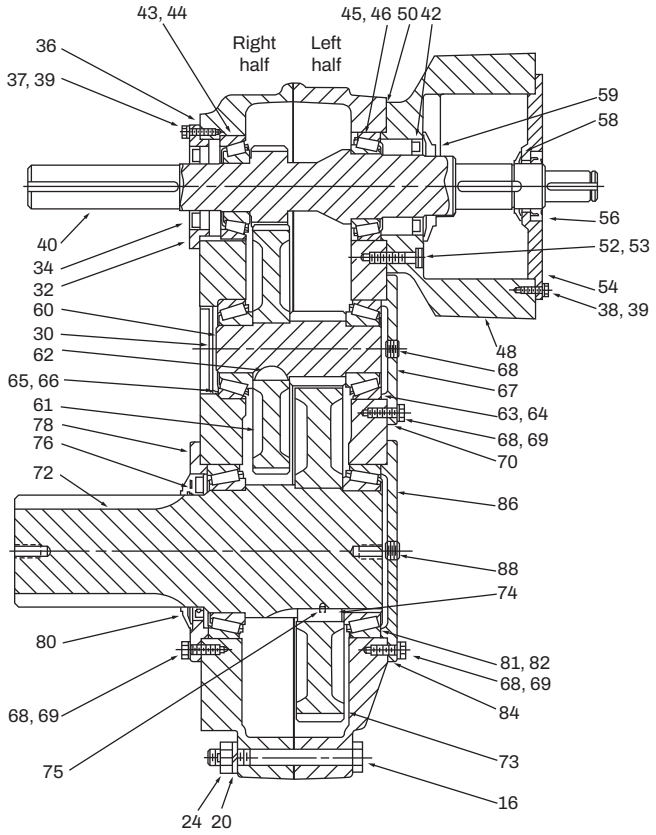
PARTS FOR NO. 191 REDUCER WINCH DRIVE / W1400



Ref.	Name of part	No. Req'd	Part No.
	Housing Assembly ①	1	⑦
④	② Air Vent	1	904287
④	② Air Vent Elbow	1	430133
16	② Housing Bolt	6	411467
④	② Mounting Pad Housing Bolt	1	411469
20	② Lockwasher	8	419019
④	② Plain Washer	4	419078
24	② Hex Nut	8	4072B3
④	② Dowel Pin	2	420112
④	② Pipe Plug	2	430033
④	② Magnetic Plug	1	430062
④	② Oil level Gauge	1	021918
32	Input Shaft Seal Carrier	1	021967
34	Input Shaft Seal - Right Half	1	245211
36	Input Shaft Seal Carrier Gasket	1	246220
37	Input Shaft Seal Carrier Screws	6	411397
38	Brake Housing Cover Screws	6	411396
39	Lockwashers	12	419033
40	Input Shaft with Pinion	1	259360
42	Input Shaft Seal	1	259366
	Input Shaft Bearing - Left Half		
43	Cone - 395A ③	1	402196
44	Cup - 3920 ③	1	403091
	Input Shaft Bearing - Right Half		
45	Cone - 396 ③	1	402197
46	Cup -3920 ③	1	403091
48	Input Shaft Brake Housing	1	259346
50	Reducer Shim Kit	2 sets ⑤	246166
52	Brake Housing Screw	6	417115
53	Lockwasher	6	419049
54	Broke Housing Cover	1	259348
56	Brake Housing Seal	1	259365
58	Brake Housing Excluder Seal	1	259363
59	Input Excluder Seal	1	259364

Ref.	Name of part	No. Req'd	Part No.
	Countershaft Assembly ①	1	391171
60	② Countershaft with Pinion	1	246294
61	② First Reduction Gear	1	246292
62	② Key	2	245218
	Countershaft Bearing - Left Half		
63	Cone _ HM807040 ③	1	402054
64	Cup - HMB07010 ③	1	403159
	Countershaft Bearing - Right Half		
65	Cone _ HM803149 ③	1	402052
66	Cup - HM803110 ③	1	403142
67	Countershaft Bearing cover - Left	1	259344
68	Half	18	411427
69	Cover Screw	18	419137
	Lockwasher		
	Output Shaft Assembly ①	1	⑥
72	② Output Shaft	1	259361
73	② Output Gear	1	246295
74	② Gear Key	2	259372
75	② Roll Pin	2	409022
76	Output Shaft Seal	1	246310
78	Output Shaft Seal Carrier	1	259342
80	Output Shaft Excluder Seal	1	259362
	Output Shaft Bearing		
81	Cone - JM822049 ③	2	402050
82	Cup - JM822010 ③	2	403140
86	Output Shaft Cover	1	259340
88	Cover Plug	2	430033
④	Lifting Bracket	1	259611

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