

Parts Replacement Manual For No. 189 Reducer Winch Drive / 0163 No. 190 Reducer Winch Drive / W5000 No. 191 Reducer Winch Drive / W1400

These instructions must be read thoroughly before installation or operation.

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 DODGE 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.

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

WARNING: Because of the possible danger to persons(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.

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°F to 350°F to shrink on output shaft (72 on #189 and #191, 74 on #190). Heat bearing cones (81 on #190 and #191) to 270°F to 290°F to shrink on shaft.
2. Countershaft Assembly: Heat gear (61 on #189 and #190, #191) to 325°F to 350°F and bearing cones (63 on #180, #190 and #191 and 65 on #190 and #191) to 270°F to 290°F 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°F to 290°F 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, #191 and #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 lubricate 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°F, 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°F lower than expected minimum ambient starting temperature.

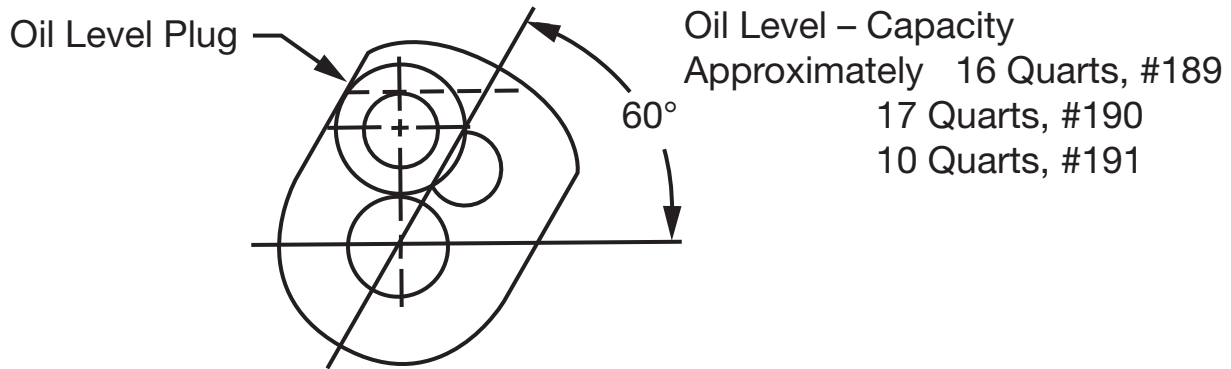
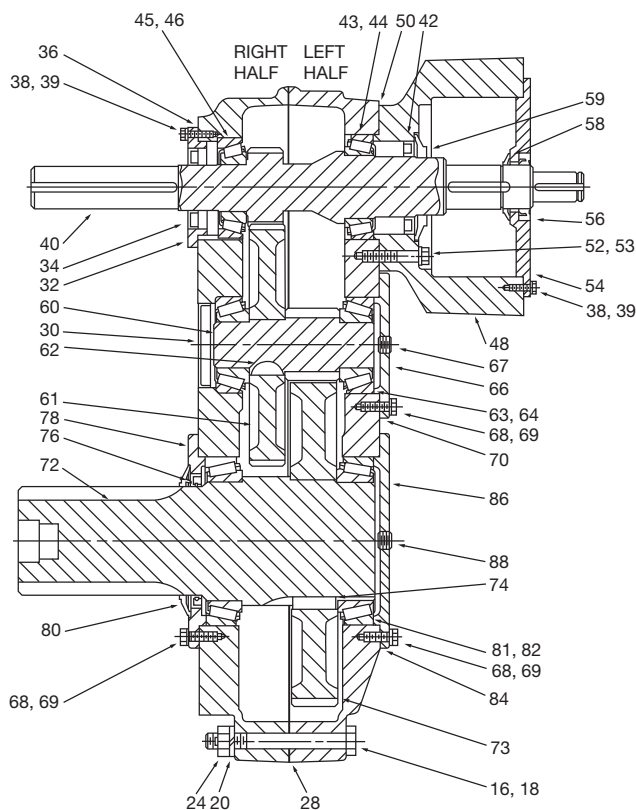


Figure 1 - Oil Level

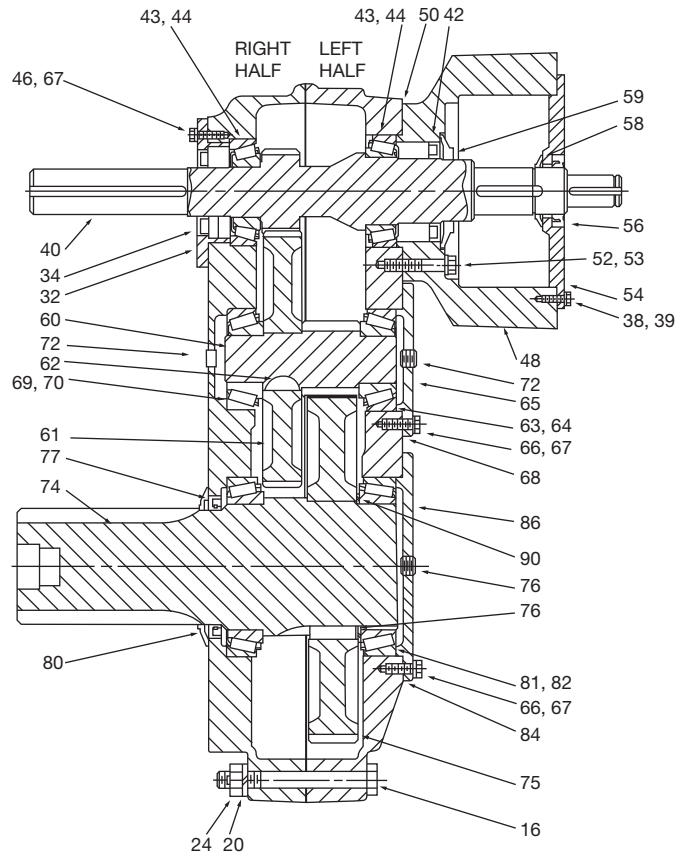
**Parts for No. 189 Reducer Winch Drive / 0163
Place Picture - Parts No. 189 Here**



Ref.	Name of part	No. Req'd	Part No.	Ref.	Name of part	No. Req'd	Part No.
	HOUSING ASSEMBLY ①	1	⑧	54	Broke Housing Cover	1	021911
⑤	② Air Vent	1	904287	56	Brake Housing Seal	1	021913
⑤	② Air Vent Elbow	1	430133	58	Brake Housing, Excluder Seal	1	021914
⑤	② Air Vent Bushing	1	430079	59	Input Excluder Seal	1	021916
16	② Housing Bolt	7	411299		COUNTERSHAFT ASSEMBLY ①	1	391196
⑤	② Mounting Pad Housing Bolt	1	411300	60	② Countershaft with Pinion	1	247002
20	② Lockwasher	8	419136	61	② First Reduction Gear	1	247008
⑤	② Plain Washer	4	419135	62	② Key	1	247218
24	② Hex Nut	8	407279		Countershaft Bearing		
⑤	② Dowel Pin	2	420128	63	Cone _ JHM807045 ③	2	402256
⑤	② Pipe Plug	1	430035	64	Cup - JHM807012 ③	2	403053
⑤	② Magnetic Plug	1	430064	66	Countershaft Bearing Cover - Left Half	1	021965
⑤	② Oil level Gauge	1	021918	67	Cover Plug	1	430033
⑤	Housing Gasket ④	1	247219	68	Cover Screws	22	411297
32	Input Shaft Seal Carrier	1	021967	69	Lockwashers	22	419139
34	Input Shaft Seal - Right Half	1	245211		OUTPUT SHAFT ASSEMBLY ①	1	⑦
36	Input Shaft Seal Carrier Gasket	1	246220	72	② Output Shaft	1	021957
38	Carrier and Cover Screws	14	411396	73	② Output Gear	1	247215
39	Lockwashers	14	419033	74	② Gear Key	2	443395
40	Input Shaft with Pinion	1	021954	76	Output Shaft Seal	1	021961
42	Input Shaft Seal	1	021917	78	Output Shaft Seal Carrier	1	021962
	Input Shaft Bearing - Left Half			80	Output Shaft Excluder Seal	1	021958
43	Cone - 39590 ③	1	402150		Output Shaft Bearing		
44	Cup - 39520 ③	1	403106	81	Cone - 48290 ③	2	402058
	Input Shaft Bearing - Right Half			82	Cup - 48220 ③	2	403111
45	Cone - 455 ③	1	402088		Output Shaft Cover	1	021963
46	Cup - 452 ③	1	403047	86	Cover Plug	1	430035
48	Input Shaft Brake Housing	1	021955	⑤	Lifting Bracket	1	021879
50	Reducer Shim Kit	2 sets ⑥	247138				
52	Brake Housing Screw	6	411298				
53	Lockwasher	6	419139				

- 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.

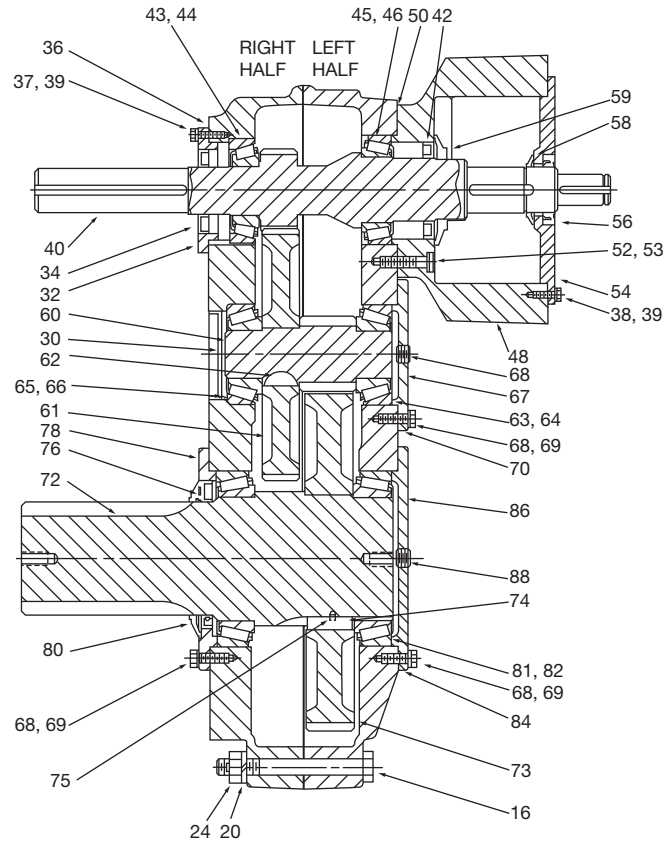
Parts for No. 190 Reducer Winch Drive / W5000



Ref.	Name of part	No. Req'd	Part No.	Ref.	Name of part	No. Req'd	Part No.
	HOUSING ASSEMBLY ①	1	⑦		COUNTERSHAFT ASSEMBLY ①	1	⑦
④	② Air Vent	1	904287	60	② Countershaft with Pinion	1	248002
④	② Air Vent Elbow	1	430133	61	② First Reduction Gear	1	021921
④	② Air Vent Bushing	1	430079	62	② Key	2	248218
16	② Housing Bolt	10	411503		Countershaft Bearing - Left Half		
④	② Mounting Pad Housing Bolt	1	411522	63	Cone _ JH211749 ③	1	402057
20	② Lockwasher	8	419136	64	Cup - JH211710 ③	1	403143
④	② Plain Washer	4	419135	66	Countershaft Bearing Cover - Left Half	1	021927
24	② Hex Nut	8	407279	67	Cover Screws		411427
④	② Dowel Pin	2	420128		Lockwashers		419137
④	② Pipe Plug	2	430035		Countershaft Bearing-Right Half		
④	② Magnetic Plug	1	430064	69	Cone _ 39585 ③	1	402148
④	② Oil level Gauge	1	021918	70	Cup - 39520 ③	1	403106
32	Input Shaft Seal Carrier	1	021929	72	Cover Plug	2	430033
34	Input Shaft Seal - Right Half	1	248211		OUTPUT SHAFT ASSEMBLY ①	1	⑥
38	Carrier and Cover Screws	8	411396	74	② Output Shaft	1	021908
39	Lockwashers	8	419033	75	② Output Gear	1	248215
40	Input Shaft with Pinion	1	021905	76	② Gear Key	2	
42	Input Shaft Seal	1	021917	77	Output Shaft Seal	1	021910
43	Input Shaft Bearing	2	402098	80	Output Shaft Excluder Seal	1	021909
44	Cone 563 ③	2	403072		Output Shaft Bearing		
48	Input Shaft Brake Housing	1	021906	81	Cone ③	2	402242
50	Reducer Shim Kit	3 sets ⑤	248111	82	Cup - LM229110 ③	2	403129
52	Brake Housing Screw	8	411428	86	Output Shaft Cover	1	021919
53	Lockwasher	8	419137	88	Cover Plug	1	430035
54	Brake Housing Cover	1	021911	90	Spacer	1	021920
56	Brake Housing Seal	1	021913	④	Lifting Bracket	1	021789
58	Brake Housing, Excluder Seal	1	021914				
59	Input Excluder Seal	1	021916				

- 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 Not shown on drawing
 ⑤ All shims are in kit
 ⑥ When no part number is listed, give reference number and/or complete description of part.

Parts for No. 191 Reducer Winch Drive / W1400



Ref.	Name of part	No. Req'd	Part No.	Ref.	Name of part	No. Req'd	Part No.
	HOUSING ASSEMBLY ①	1	⑦	54	Brake Housing Cover	1	259348
④	② Air Vent	1	904287	56	Brake Housing Seal	1	259365
④	② Air Vent Elbow	1	430133	58	Brake Housing Excluder Seal	1	259363
16	② Housing Bolt	6	411467	59	Input Excluder Seal	1	259364
④	② Mounting Pad Housing Bolt	1	411469		COUNTERSHAFT ASSEMBLY ①	1	391171
20	② Lockwasher	8	419019	60	② Countershaft with Pinion	1	246294
④	② Plain Washer	4	419078	61	② First Reduction Gear	1	246292
24	② Hex Nut	8	4072B3	62	② Key	2	245218
④	② Dowel Pin	2	420112		Countershaft Bearing - Left Half		
④	② Pipe Plug	2	430033	63	Cone _ HM807040 ③	1	402054
④	② Magnetic Plug	1	430062	64	Cup - HMB07010 ③	1	403159
④	② Oil level Gauge	1	021918		Countershaft Bearing - Right Half		
32	Input Shaft Seal Carrier	1	021967	65	Cone _ HM803149 ③	1	402052
34	Input Shaft Seal - Right Half	1	245211	66	Cup - HM803110 ③	1	403142
36	Input Shaft Seal Carrier Gasket	1	246220	67	Countershaft Bearing cover - Left Half	1	259344
37	Input Shaft Seal Carrier Screws	6	411397	68	Cover Screw	18	411427
38	Brake Housing Cover Screws	6	411396	69	Lockwasher	18	419137
39	Lockwashers	12	419033		OUTPUT SHAFT ASSEMBLY ①	1	⑥
40	Input Shaft with Pinion	1	259360	72	② Output Shaft	1	259361
42	Input Shaft Seal	1	259366	73	② Output Gear	1	246295
	Input Shaft Bearing - Left Half			74	② Gear Key	2	259372
43	Cone - 395A ③	1	402196	75	② Roll Pin	2	409022
44	Cup - 3920 ③	1	403091		Output Shaft Seal	1	246310
	Input Shaft Bearing - Right Half			76	Output Shaft Seal Carrier	1	259342
45	Cone - 396 ③	1	402197	80	Output Shaft Excluder Seal	1	259362
46	Cup - 3920 ③	1	403091		Output Shaft Bearing		
48	Input Shaft Brake Housing	1	259346	81	Cone - JM822049 ③	2	402050
50	Reducer Shim Kit	2 sets ⑤	246166	82	Cup - JM822010 ③	2	403140
52	Brake Housing Screw	6	417115		Output Shaft Cover	1	259340
53	Lockwasher	6	419049	86	Cover Plug	2	430033
				④	Lifting Bracket	1	259611

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 Not shown on drawing

⑤ All shims are in kit

⑥ When no part number is listed, give reference number and/or complete description of part.

Dodge Industrial, Inc.
1061 Holland Road
Simpsonville, SC 29681
+1 864 297 4800

