

# Parts Replacement Manual

For

## TORQUE-ARM™ Speed Reducer Straight Bore

**SIZE: TXT1225**

**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 Baldor Electric Company nor are the responsibility of Baldor Electric Company. 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.

---

**BALDOR**

---

World Headquarters  
P.O. Box 2400, Fort Smith, AR 72902-2400 U.S.A., Ph: (1) 479.646.4711, Fax (1) 479.648.5792, International Fax (1) 479.648.5895  
Dodge Product Support  
6040 Ponders Court, Greenville, SC 29615-4617 U.S.A., Ph: (1) 864.297.4800, Fax: (1) 864.281.2433  
[www.baldor.com](http://www.baldor.com)

© Baldor Electric Company

All Rights Reserved. Printed in USA.

MN1670  
(Replaces 499846)



06/30/09

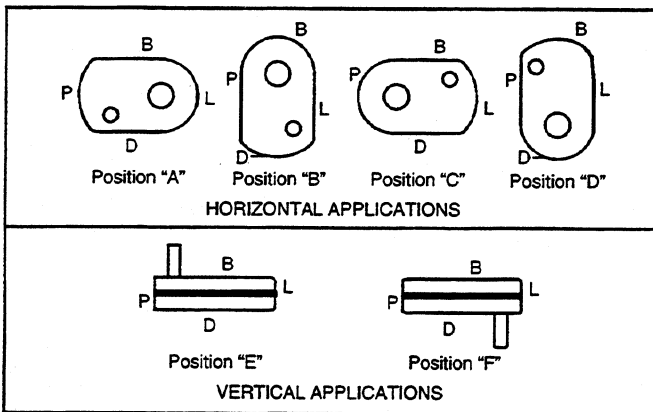
## INSTALLATION

1. Remove the plastic plugs that protect the threaded holes in the sides of the reducer housing and install the lifting brackets supplied with the reducer.
2. Determine the running position of the reducer (See Fig. 1). Note that the reducer housing has been machined for pipe plugs around the sides of the reducer for horizontal applications and in each face for vertical installations. The plugs must be arranged relative to the running positions as follows:

**Horizontal Installations**—Install the magnetic drain plug in the hole closest to the bottom of the reducer. Throw away the tape that covers the filler/ventilation plug in shipment and install plug in topmost hole. Of the remaining plugs on the sides of the reducer, the lowest one is the minimum oil level plug.

**Vertical Installations**—Install the filler/ventilation plug in the hole provided in the top face of the reducer housing. Use the hole in the bottom face for the magnetic drain plug. Of the remaining holes on the sides of the reducer, use a plug in the upper housing half for the minimum oil level plug.

The running position of the reducer in a horizontal application is not limited to the four positions shown in Figure 1. However, if running position is over 20° in position "B" or "D" or 5° in position "A" or "C" either way from sketches, the oil level plug cannot be safely used to check the oil level, unless during the checking the torque arm is disconnected and the reducer is swung to within 20°/5° of the positions shown in Figure 1. Because of the many possible positions of the reducer, it may be necessary or desirable to make special adaptations using the lubrication fitting holes furnished along with other standard pipe fittings, stand pipes and oil level gages as required.



B: Breather; D: Drain; L: Oil Level Plug; P: Plug

Fig. 1 — Mounting Positions

3. **For Straight Bore:** Mount reducer on driven shaft as close to bearing as practical. If bushings are used, assemble bushings in reducer first. A set of bushings for one reducer consists of one keyseated bushing and one plain bushing. Extra length setscrews are furnished with the reducer. Driven shaft should extend through full length of speed reducer. Tighten both setscrews in each collar.

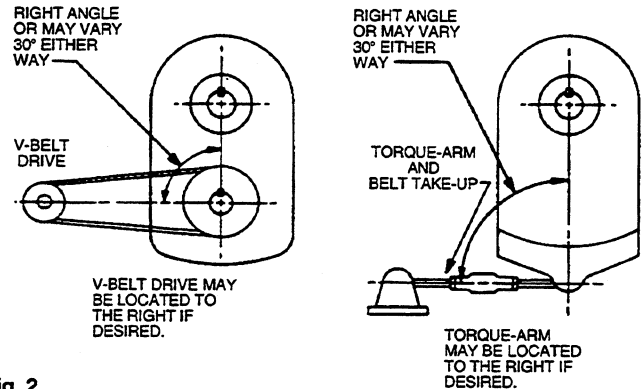


Fig. 2

4. Install sheave on input shaft as close to reducer as possible.
5. Install motor and V-belt drive so belt pull will be roughly at right angles to the center line between driven and input shaft. (See Fig. 2) This will permit tightening the V-belt drive with the torque arm.
6. Install torque-arm adapter plates on the input end of the reducer.
7. Install torque-arm fulcrum on a rigid support so that the torque-arm will be approximately at right angles to the center line through the driven shaft and the torque-arm anchor screw. (See Fig. 2) Make sure that there is sufficient take-up in the turnbuckle for belt tension adjustment when using V-belt drive.
8. Retighten bolts and pipe plugs after a few days of operation. This prevents oil leakage.

## LUBRICATION

**Important:** Since reducer is shipped without oil, it is necessary to add the proper amount of oil before running. Use a high grade petroleum base, rust and oxidation inhibited (R & O) gear oil—see tables. Follow instructions on reducer nameplate, warning tags, and in the installation manual.

Under average industrial operating conditions, the lubricant should be changed every 2500 hours of operation or every 6 months, whichever occurs first. Drain reducer and flush with kerosene, clean magnetic drain plug and refill to proper level with new lubricant.

### CAUTION

**Too much oil will cause overheating and too little will result in gear failure. Check oil level frequently. Failure to observe these precautions could result in damage to, or destruction of, the equipment.**

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.

**Table 1 — Oil Volumes**

Reducer Size	Volume of Oil Required to Fill Reducer to Oil Level Plug																	
	† Position A			† Position B			† Position C			† Position D			† Position E			† Position F		
	Fluid Ounces (Approx)	Quarts (Approx)	Liters (Approx)	Fluid Ounces (Approx)	Quarts (Approx)	Liters (Approx)	Fluid Ounces (Approx)	Quarts (Approx)	Liters (Approx)	Fluid Ounces (Approx)	Quarts (Approx)	Liters (Approx)	Fluid Ounces (Approx)	Quarts (Approx)	Liters (Approx)	Fluid Ounces (Approx)	Quarts (Approx)	Liters (Approx)
TXT12	1884	58 <sup>7</sup> / <sub>8</sub>	55.7	1216	38	36	1884	58 <sup>7</sup> / <sub>8</sub>	55.7	1164	36 <sup>3</sup> / <sub>8</sub>	34.4	3200	100	95	3200	100	95

† Refer to Fig. 1 on page 2 for mounting positions.

▲ U.S. Measure: 1 quart = 32 fluid ounces = .94646 liters.

Note: If reducer position is to vary from those shown in Figure 1, either more or less oil may be required. Consult factory.

**TABLE 2—Minimum Oil Recommendations for Average Operating Conditions**

Lubrication Recommendations —  
ISO Grades for Ambient Temperatures of 15° to 60°

Output RPM	Reducer Size														
	1	2	3	4	5	6	7	8	9	10	12	13	14	15	
301-400	220	220	150	150	150	150	150	150	150	150	150	150	150	150	
201-300	220	220	150	150	150	150	150	150	150	150	150	150	150	150	
151-200	220	220	150	150	150	150	150	150	150	150	150	150	150	150	
126-150	220	220	220	150	150	150	150	150	150	150	150	150	150	150	
101-125	220	220	220	220	150	150	150	150	150	150	150	150	150	150	
81-100	220	220	220	220	220	150	150	150	150	150	150	150	150	150	
41-80	220	220	220	220	220	150	150	150	150	150	150	150	150	150	
11-40	220	220	220	220	220	220	220	220	220	220	150	150	150	150	
1-10	220	220	220	220	220	220	220	220	220	220	220	220	220	220	

Below - 23°F call application engineering.

20°F to -22°F use Mobil SHC 627.

Above 125°F use Mobil SHC 634.

### NOTE:

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

### CAUTION

**Extreme pressure (EP) lubricants are not recommended for average operating conditions. Failure to observe these precautions could result in damage to, or destruction of, the equipment.**

Lubrication Recommendations —  
ISO Grades for Ambient Temperatures of 50° to 125°

Output RPM	Reducer Size														
	1	2	3	4	5	6	7	8	9	10	12	13	14	15	
301-400	320	320	220	220	220	220	220	220	220	220	220	220	220	220	
201-300	320	320	220	220	220	220	220	220	220	220	220	220	220	220	
151-200	320	320	220	220	220	220	220	220	220	220	220	220	220	220	
126-150	320	320	320	220	220	220	220	220	220	220	220	220	220	220	
101-125	320	320	320	320	220	220	220	220	220	220	220	220	220	220	
81-100	320	320	320	320	320	220	220	220	220	220	220	220	220	220	
41-80	320	320	320	320	320	320	220	220	220	220	220	220	220	220	
11-40	320	320	320	320	320	320	320	320	320	320	220	220	220	220	
1-10	320	320	320	320	320	320	320	320	320	320	320	320	320	320	

Special lubricants may be required for food and drug industry applications where contact with the product being manufactured may occur. Consult a lubrication manufacturer's representative for his recommendation.

### CAUTION

**Do not use EP oils or oils containing slippery additives such as graphite or molybdenum disulphide in the reducer when backstop is used. These additives will destroy sprag action. Failure to observe these precautions could result in damage to, or destruction of, the equipment.**

## GUIDELINES FOR TORQUE-ARM REDUCER LONG-TERM STORAGE

During periods of long storage, or when waiting for delivery or installation of other equipment, special care should be taken to protect a gear reducer to have it ready to be in the best condition when placed into service.

By taking special precautions, problems such as seal leakage and reducer failure due to the lack of lubrication, improper lubrication quantity, or contamination can be avoided. The following precautions will protect gear reducers during periods of extended storage:

### Preparation

1. Drain the oil from the unit. Add a vapor phase corrosion inhibiting oil (VCI-105 oil by Daubert Chemical Co.) in accordance with Table 3.
2. Seal the unit air tight. Replace the vent plug with a standard pipe plug and wire the vent to the unit.
3. Cover the shaft extension with a waxy rust preventative compound that will keep oxygen away from the bare metal. (Non-Rust X-110 by Daubert Chemical Co.)
4. The instruction manuals and lubrication tags are paper and must be kept dry. Either remove these documents and store them inside or cover the unit with a durable waterproof cover which can keep moisture away.

5. Protect the reducer from dust, moisture, and other contaminants by storing the unit in a dry area.
6. In damp environments, the reducer should be packed inside a moisture-proof container or an envelope polyethylene containing a desiccant material. If the reducer is to be stored outdoors, cover the entire exterior with a rust preventative.

### When Placing the Reducer into Service

1. Assemble the vent plug into the proper hole.
2. Clean the shaft extensions with a suitable solvent.
3. Fill the unit to the proper oil level using a recommended lubricant. The VCI oil will not affect the new lubricant.
4. Follow the installation instructions provided in this manual.

**Table 3 — Quantities of VCI #105 Oil**

Case Size	Quarts or Liters
TXT12	2.5

VCI #105 & #10 are interchangeable.

VCI #105 is more readily available.

## MOTOR MOUNTS

The motor mount must be installed on output end of reducer as shown in Figure 3.

Remove four housing bolts on output end of reducer. Install back support 1 and front support 2 with new housing bolts. Install mounting bolts 3.

Install mounting plate 5 with adjusting studs 4 as shown in Figure 3.

Assemble one motor rail 6 by loosely bolting through the two front holes on each side of mounting plate (see Figure 3) with mounting rail bolts 7.

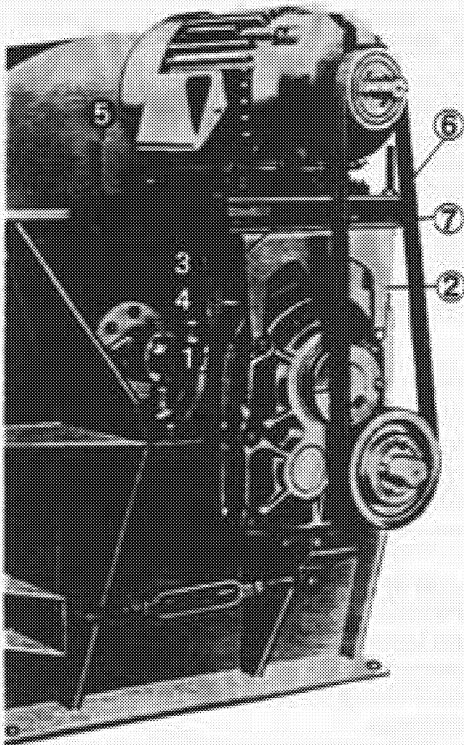
Measure the distance between front and rear mounting holes of motor. Position the rear motor rail to this distance and loosely bolt to the mounting plate.

Center the motor on the motor rails. Use a plain washer under each slot in the motor rails when the mounting bolts are less than  $\frac{5}{8}$ " diameter. Bolt motor snugly to motor rails.

Install motor sheave and reducer sheave on their shafts as close as possible to the motor and reducer housings. **Note:** The motor rails may be moved forward or backward from the position shown in Figure 3 to permit alignment of the V-belt sheaves. It is permissible for the front motor rail to extend beyond the mounting plate 5. Align the V-belt sheaves carefully and tighten all bolts securely.

Install V-belts and adjust belt tension. Figure 3 shows the mount near the minimum belt center position. To increase the center distance, loosen the four nuts "A" on the adjusting studs and tighten the four nuts "B" alternately and evenly until the belts are properly tensioned.

Check all bolts to see that they are securely tightened.



**Note:** Guards have been removed for photographic purposes.

**Fig. 3**

## REPLACEMENT OF PARTS

### IMPORTANT:

Using tools normally found in a maintenance department, a DODGE TORQUE-ARM Speed 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.

Our factory is prepared to repair reducers for customers who do not have proper facilities or who for any reason desire factory service.

The oil seals are of the rubbing type and considerable care should be exercised during disassembly and reassembly to avoid damage to surfaces on which the seals rub.

### ORDERING PARTS:

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

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

If the large gear on the output hub must be replaced, it is recommended that an output hub assembly of a gear assembled on a hub be ordered to secure undamaged surfaces on the output hub where the oil seals rub. However, if it is desired to use the old output hub, press the gear and bearing off and carefully examine the rubbing surface 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 hub must not be damaged.

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

Because old oil seals, wear rings or gaskets 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 bearings on each shaft assembly is affected.

### REMOVING REDUCER FROM SHAFT:

#### STRAIGHT BORE —

Loosen screws in both output hub collars. Remove the collar next to end of shaft. This exposes three puller holes in output hub to permit use of wheel puller. In removing reducer from shaft be careful not to damage ends of hub.

### DISASSEMBLY:

1. Remove all bolts from housing. Open housing evenly to prevent damage to parts inside.
2. Lift shaft, gear and bearing assemblies from housing.
3. Remove seals, bearing covers, seal carriers, backstop carrier and bearing cups from housing.

### REASSEMBLY:

1. **Output Hub Assembly:** Heat gear to 325°F to 350°F to shrink onto hub. Heat bearings to 270°F to 290°F to shrink onto hub. Any injury to the hub surfaces where the oil seals rub will cause leakage making it necessary to use a new hub.
2. **Countershaft Assembly:** Shaft and pinion are integral. Heat gear to 325°F to 350°F to shrink on shaft. Heat bearing cones to 270°F to 290°F to shrink on shaft.
3. **Input Shaft Assembly:** Slide pinion on shaft. Heat bearing cones to 270°F to 290°F to shrink on shaft.
4. Place a 1/8" diameter bead of Dow Corning RTV732 sealant part number 465044 on the face around the I.D. of the shim (sealant is to be between shim and reducer). Caution: If too much sealant is used, it will run into the bearing and too little sealant will result in an ineffective seal. Install bearing covers, output hub seal carrier and backstop carrier on right half of housing (as viewed in drawing). Put bearing cups in place. Make sure the cups are properly seated in the housing and are pressed against the countershaft bearing, output seal carrier and backstop carrier. Place housing on blocks to allow clearance for protruding end of output hub.
5. Mesh output hub assembly and countershaft assemblies together and place in housing half. Place input shaft assembly in position. Make sure rollers are properly seated in bearing cups. Make sure input pinion is central between bearings on input shaft. If not central, re-engaged gear teeth properly to make central.
6. Clean housing flange surfaces on both halves, making sure not to nick or scratch flange face. Place a 1/8" diameter bead of Dow Corning RTV732 sealant on the flange face.

Place other housing half into position and tap with a soft hammer until housing bolts can be used to draw housing halves together. Torque housing bolts per torque values listed in Table 4.

7. Install the output hub seal carrier and the shims previously removed. **Note:** If the housing, hub, bearing or carrier has been replaced, use more shims than previously removed. Tighten the carrier cap screws. Rotate the hub while tightening these screws to assure that the bearing does not bind. If the bearing starts to bind, add more

the gage on the top end of the output hub. Insert a pry bar under the other end of the hub and force it upward. The end play of the hub will be given by the indicator reading. Remove or add shims until the indicator reading is 'AA' in Table 4. Tighten screws per torque values listed in Table 4.

8. Using similar procedure adjust the bearings on one of the countershafts. (This can be accomplished by removing the plugs from the covers, placing a piece of rod on the pry bar and prying through the cover.) Remove or add shims until indicator reading is 'BB' in Table 4. Tighten screws per torque values listed in Table 4. Then similarly adjust the bearings on the other countershaft.
9. Again using similar procedure adjust the bearings on the input shaft. (Backstop cover must be removed.) Remove or add shim stock until the indicator reading is 'CC' in Table 4. Tighten screws per torque values listed in Table 4.

**Table 4 — Torque Values**

Reducer Size	Housing Bolts (in.-lb.)	Output Hub Seal Carrier (in.-lb.)	AA	C'Shaft & Input Shaft Carrier & Cover (in.-lb.)	BB	CC
TXT12	1620	3120	.001" to .003"	1800	.001" to .003"	.002" to .003"

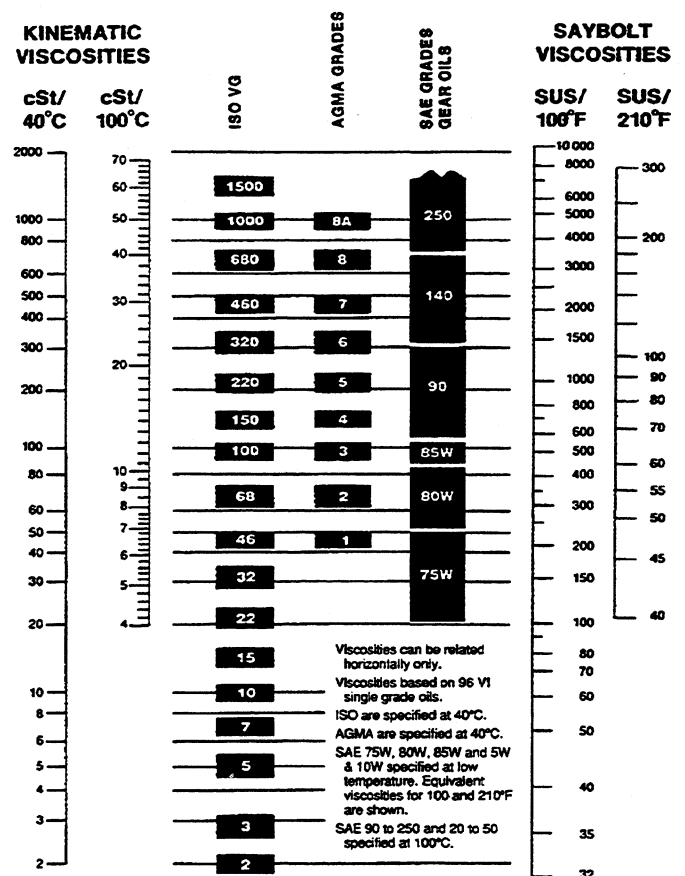
**Table 5 — Manufacturers' Part Numbers For Replacement Bearings**

TORQUE-ARM Reducer Size	Output Hub Bearing			
	DODGE Part Number		Timken* Part Number	
	Cone	Cup	Cone	Cup
TXT12	402039	403119	67983	67920
Countershaft Bearing				
TXT12	402127	403089	6575	6535
Input Shaft Bearing—Input End				
TXT12	402125	403087	6484	6420
Input Shaft Bearing—Backstop End				
TXT12	402125	403087	6484	6420

\*Registered TIMKEN Co. TM

10. Extreme care should be used in installing seals on input shaft and output hub to avoid damage which would result in oil leakage. This danger of damage and consequent oil leakage can be decreased by covering the keyseat and retaining ring groove with scotch tape or paper which can be removed subsequently. Chamfer or deburr 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 outer corner of seals. A slight oil leakage at the seals may be evident during initial running in, but will disappear unless the seals have been damaged.

**Viscosity Classification Equivalents**



Reference	Name of Part	No. Req'd.	TXT12 Part No.	Reference	Name of Part	No. Req'd.	TXT12 Part No.
12	Backstop Assembly	1	250260	74	Countershaft Brg. Cone	4	402127
	HOUSING	1	252163	76	Countershaft Brg. Cup	4	403089
15	Air Vent	1	271041	78	Countershaft Brg. Spacer	2	272017
16	Housing Bolt	12	411506	80	Countershaft Brg. Cover	4	272016
18	Adapter Housing Bolt	4	411508	84	Cover Plug	4	430035
20	Lockwasher	16	419016	86	Countershaft Bearing Shim Pack	2	392151
22	Plain Washer	2	419082		OUTPUT HUB		
24	Hex Nut	16	407095	88	Output Hub	1	961623
26	Dowel Pin	2	420132	90	Output Gear	1	272007
30	Pipe Plug	2	430035	92	Gear Key & Roll Pin	3	390859
32	Magnetic Plug	1	430064	94	Hub Collars	2	961930
34	Input Shaft Seal Carrier	1	272019	96	Collar Set Screw	4	400198
38	Input Shaft Bearing Shim Pack	4	392150	100	Output Hub Key 6 <sup>5</sup> / <sub>8</sub> " Bore	1	961931
40	Backstop Carrier	1	272020	106	Output Hub Seal	2	2772010
42	Carrier & Cover Screw	16	411483	110	Output Hub Seal Carrier	2	272014
43	Countershaft Cover Screw	32	411483	114	Carrier Screw	16	411493
44	Lockwasher	48	419014	116	Lockwasher	16	419016
46	Backstop Cover	1	248221	118	Output Hub Brg. – Cone	2	402039
48	Cover Gasket	1	248220	120	Output Hub Brg. – Cup	2	403119
50	Backstop Cover Cap Screw	6	411402	122	Output Hub Brg. Spacer	1	272012
52	Lockwasher	6	419009	124	Output Hub Bearing Shim Pack	2	392152
54	Input Shaft	1	272004	126	Rod End	1	272050
56	Input Pinion	1	272003	128	Hex Nut	1	407108
58	Input Shaft Seal	1	272211	130	Tumbuckle	1	272051
62	Input Shaft Key	1	443122	132	Extension	1	272052
63	Input Shaft Brg. Cone – Input End	1	402125	134	L.H. Hex Nut	1	407251
64	Input Shaft Brg. Cone – B'Stop End	1	402125	136	Fulcrum	1	272054
66	Input Shaft Brg. Cup	2	403087	138	Fulcrum Screw	1	411524
67	Input Shaft Brg. Spacer	1	.....		ADAPTER ASSEMBLY*	1	.....
	COUNTERSHAFT ASSEMBLY			140	*Adapter Plate	2	272049
68	Left Hand Spiral*	1	↓	142	*Adapter Bushing	1	272046
	*Countershaft with Pinion	1	272006	144	*Adapter Bolt	1	411520
70	*L.H. 1st Reduction Gear	1	272005	146	*Lockwasher	2	419024
72	*Key	2	248218	148	*Hex Nut	2	407104
	COUNTERSHAFT ASSEMBLY			* Includes parts listed immediately below marked "A." Housing assembly also includes two-piece bushing.			
68	Right Hand Spiral*	1	↓	▲ The parts marked "A" make up the assemblies under which they are listed. Housing assembly also includes two-piece bushing.			
	*Countershaft with Pinion	1	272006	† See last paragraph under "ORDERING PARTS."			
71	*R.H. 1st Reduction Gear	1	272011	↓ Use reference number when ordering; giving complete part identification.			
72	*Key	2	248218	* Recommended spare parts.			

## PARTS FOR TORQUE-ARM SPEED REDUCER

NOTE: The two-digit numbers are for reference use. Order parts by the six-digit part numbers in the Parts List whenever possible. Each six-digit number is a complete identification of the part or assembly.

