

INSTRUCTION MANUAL
FOR
DODGE®
Screw Conveyor
Drive

SIZES: SCXT 105
SCXT 205

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 Reliance Electric Industrial Company nor are the responsibility of Reliance Electric Industrial 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.

DODGE / 6040 Ponders Court / P.O. Box 499 / Greenville, S.C. 29602-0499 / 803-297-4800

© Reliance Electric Company, 1992 DODGE
is a registered trademark of Reliance Electric
Company or its affiliates.

**RELIANCE
ELECTRIC** 

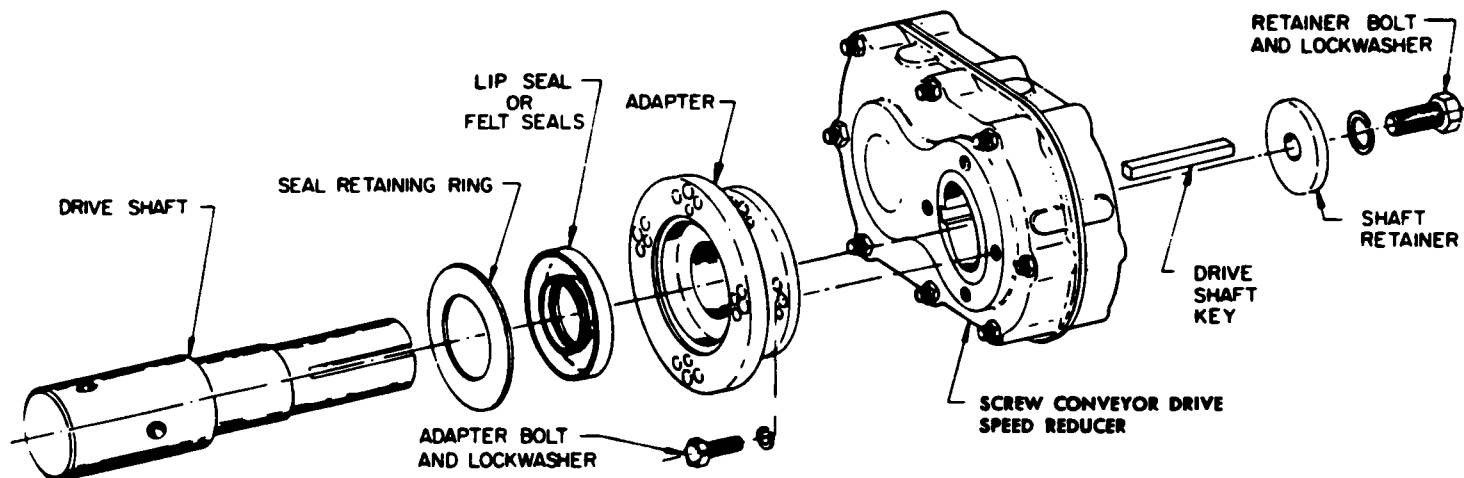


Fig. 1 — Assembly

A screw conveyor drive consists of three sub-assemblies listed below.

1. **Reducer** — Includes speed reducer, shaft retainer, retainer bolt and lockwasher.
2. **Adapter Assembly** — Includes adapter bolts, lockwashers, a lip-type seal, 2 braided-type seals and seal retaining ring.
3. **Drive Shaft** — Includes shaft and key.

Make certain none of the parts have been damaged in shipment. Any shipping damage should be promptly reported to the carrier. Read all instructions in this manual before attempting to assemble or install the screw conveyor drive. It is important that assembly be performed in the following sequence and that each step be completed before continuing to the next.

ASSEMBLY

1. Place reducer on blocks so that it lays flat with the input shaft down.
2. Position adapter on reducer output hub so that small end (end with 12 holes) rests on reducer. Select the 4 mounting holes to match the shaft used. **Note:** "A" adapters used on SCXT 105 and SCXT 205 reducers with 1½" drive shafts have only 4 holes on the small end.

The center set of holes (Marked "C"):
For use with 1½", 2" or 37/16" shafts.

The left-hand set of holes (Marked "L"):
For use with 27/16" shafts.

The right-hand set of holes (Marked "R"):
For use with 3" shafts.

3. Place adapter screws and lockwashers through adapter and thread into reducer. Do Not Tighten.
4. Select either lip-type or braided-type seals and install as follows:

Lip-Type Seals. Place seal in adapter so that spring faces out. Seal should be tapped evenly into place in the adapter with a soft hammer, applying force only on the outer corner of the seal. Fill cavity between lips of seal with grease. Install seal retainer ring by tapping with a hammer. Apply grease to adapter section of shaft (middle section). Slide shaft, keyseated end first, into adapter and through reducer. **Note:** Be extremely careful

when sliding adapter section of shaft through seal to prevent seal lips from being damaged or rolled over.

Braided-Type seals. Flatten both seals with a soft hammer. Place seals in adapter, one on top of the other with joints offset from each other. Lay retaining ring loosely on top of seals. Slide shaft, keyseated end first, into adapter and through reducer. Take care to clear the seals with the adapter section of the shaft. Once shaft has bottomed, seat retainer ring by simultaneously hitting the face of the ring on opposite sides of the shaft with two hammers.

5. Carefully place reducer on its side. Rotate shaft to align keyseats in shaft and output hub and install key. Install shaft retainer, lockwasher and bolt. Tighten bolt to torque specified in Table 3 on page 5.
6. Lay reducer on blocks with input shaft down and tighten adapter bolts to torque specified in Table 3 on page 5.
7. If waste packing is to be used, it may be installed through access hole provided in the adapter. Waste packing, not furnished with the screw conveyor drive, may be used as a separate seal option or in combination with either the lip or braided seals.

WARNING

To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

INSTALLATION

1. Determine the running position of the screw conveyor drive. Running positions are shown in Fig. 2. Note that the reducer is supplied with 7 plugs; 5 around the sides of the reducer for horizontal installations and 1 on each face for vertical installations. These plugs must be arranged relative to the running position 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 3 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 5 remaining holes on the sides of the reducer, use a plug in the upper housing half for the minimum oil level plug.

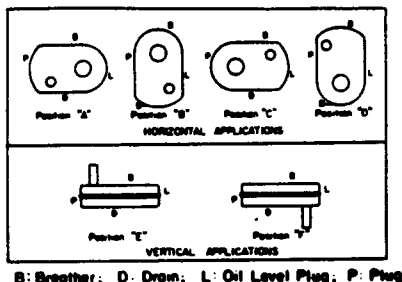


Fig. 1 — Mounting Positions

Note: If motor mount, motor and sheaves are to be installed on reducer before mounting Screw Conveyor Drive to trough end, bypass step 2; perform steps 3 and 4, and then return to step 2.

2. Hoist the screw conveyor drive into position. Slide shaft into screw and adapter over trough end studs. Only one set of adapter holes will fit over trough end studs. If the mounted position of the screw conveyor drive varies by 15° from any of the four horizontal mounting positions shown in Fig. 2, an incorrect set of holes has been selected for coupling adapter to reducer. This can be corrected by removing adapter screws and rotating reducer to its proper position. Reinstall and tighten adapter screws to torque specified in Table 3 on page 5. Install lockwashers and tighten nuts on trough end studs. Attach drive shaft to screw.
3. Remove the three bolts from reducer housing required for mounting the SCXT motor mount. Place the motor mount in position and install the three housing bolts supplied with the motor mount. Tighten bolts to torque specified in Table 3 on page 5.
4. Install motor, drive sheave and driven sheave so that driven sheave is as close to the reducer housing as practical. Install V-belt and tension with the four adjusting screws provided on the SCXT motor mount. Make required electrical connections for motor.

CAUTION

Unit is shipped without oil. Add proper amount of recommended lubricant before operating. Failure to observe these precautions could result in damage to or destruction of, the equipment.

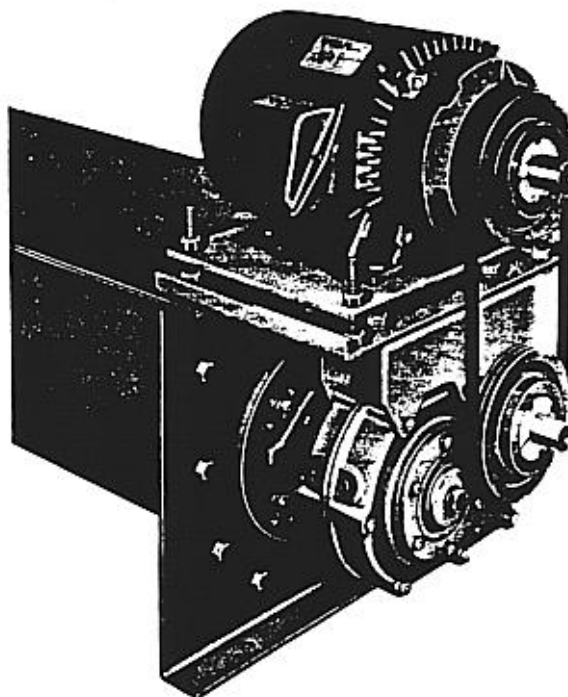


Fig. 3 — Complete Drive

Note: Belt guard not shown for clarity.

WARNING

Do not operate if belt guard is not in place.

5. Because reducer is shipped without oil, it is necessary to add the proper amount before operating the drive. Use a high grade petroleum-base, rust and oxidation inhibited (R & O) gear oil — see lubrication tables.
6. Retighten bolts and pipe plugs after a few days operation.

LUBRICATION

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 regularly.

Under extreme operating conditions, such as rapid rise and fall of temperatures, 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.

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

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

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

TABLE 1 — OIL VOLUMES

SCXT SIZE	Amount 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 Δ (Approx)	Liters (Approx)	Fluid Ounces (Approx)	Quarts Δ (Approx)	Liters (Approx)	Fluid Ounces (Approx)	Quarts Δ (Approx)	Liters (Approx)	Fluid Ounces (Approx)	Quarts Δ (Approx)	Liters (Approx)	Fluid Ounces (Approx)	Quarts Δ (Approx)	Liters (Approx)	Fluid Ounces (Approx)	Quarts Δ (Approx)	Liters (Approx)
SCXT 105	20	3/4	.59	24	3/4	.71	20	5/8	.59	24	3/4	.71	36	1 1/8	1.06	44	1 3/8	.30
SCXT 205	24	3/4	.71	28	7/8	.83	28	7/8	.83	28	7/8	.83	56	1 3/4	1.66	72	2 1/4	2.13

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

Δ 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 — OIL RECOMMENDATIONS FOR AVERAGE OPERATING CONDITIONS

Ratio and Output RPM	Ambient Temp. ° Fahr.	OIL		VISCOSITY	
		S.A.E. No.	AGMA Lub. No.	ASTM SUS @ 100°F.	Metric Equiv. c St @ 40°C.
5:1 — Up to 225 rpm	-25° through 50°	10W30	—	—	—
	15° through 50°	30	3	417 to 510	90 to 110
	50° through 125°	40	4	626 to 765	135 to 165
5:1 — 226 rpm and Up	-25° through 50°	10W40	—	—	—
	15° through 50°	40	4	626 to 765	135 to 165
	50° through 125°	50	5	918 to 1122	198 to 242

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 preventive 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 of polyethylene containing a desiccant material. If the reducer is to be stored outdoors, cover the entire exterior with a rust preventive.

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 VCI #105 OIL
DODGE Part Number 415112-80-DB

Case Size	Quarts or Liters
SCXT105	.1
SCXT205	.2

VCI #105 & #10 are interchangeable.

VCI #105 is more readily available.

REPLACEMENT OF PARTS

DODGE is prepared to repair screw conveyor drive speed reducers for customers who do not have the proper facilities or for those who desire factory service. However, if the customer has access to an arbor press, equipment for heating and shrinking bearings and gears on shafts, and the tools normally found in a maintenance department, the screw conveyor drive speed reducer can easily be disassembled and reassembled by careful attention to the following instructions.

Cleanliness is very important to prevent the introduction of dirt into the bearings and other parts of the reducer. The oil seals are of the rubbing type and considerable care should be exercised during disassembly or reassembly to avoid damage to the surfaces on which these seals rub. Any sharp edges on the input shaft or output hub should be covered with adhesive tape or paper before performing any

work on the unit. Nicks and burrs on surfaces of the input shaft or output hub should be removed.

ORDERING PARTS

When ordering parts specify screw conveyor drive size and serial number, part name, part number and quantity.

Parts that must be pressed from shafts or output hub should be removed before ordering parts. This assures that those parts, if damaged during pressing operation, will be replaced. Do no press against the outer race of any ball bearing.

It is recommended that when a pinion or gear is replaced, its mating gear or pinion be replaced also. This ensures that the gear teeth will mesh properly. If the large gear on the output hub must be replaced, it is suggested that an output hub assembly, consisting of a gear assembled on an output hub, be ordered to secure an output hub with undamaged surfaces on which the oil seals rub. However, if the old output hub is to be used, carefully press the gear and bearing cones off. Thoroughly examine the area under the oil seals for scratches or any other damage resulting from the pressing operation. To prevent leakage at the oil seals, the rubbing area must be smooth.

Replacements for the oil seals should be ordered, due to the probability of these parts being damaged during disassembly.

If replacing an output hub bearing, output hub or reducer housing, it is advisable to order a set of output hub shims because the adjustment of the output hub bearing will be affected.

REMOVING SCREW CONVEYOR DRIVE FROM THE TROUGH END

WARNING

To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

Disconnect any electrical power to the drive. Drain lubricant from reducer. Uncouple drive shaft and screw. Remove nuts from trough end studs. Support drive by means of hoist and carefully pull unit away from trough end to slide drive shaft out of screw.

DISASSEMBLY

1. Remove motor from motor mount. Remove retainer bolt, lockwasher and shaft retainer from drive shaft. Pull drive shaft out of reducer from adapter side. Remove adapter.
2. Position reducer on its side and remove all bolts. Gently tap the output hub and input shaft with a soft hammer (rawhide not lead hammer) to separate the housing halves. Open housing evenly to prevent damage to the parts inside.
3. Lift shaft, gear and bearing assemblies from housing.
4. Remove input shaft, output hub and adapter seals. Remove output hub seal carrier and shims. Remove output hub bearings cups from housing.
5. Clean all parts in solvent, inspect for damage and coat with oil.

REASSEMBLY

1. **Output Hub Assembly:** Heat gear to 325° to 350°F. to shrink onto output hub. Heat bearing cones to 270° to 290°F. to shrink onto hub.
2. **Input Shaft Assembly:** Shaft and pinion are integral. Press bearings on shaft. Press against inner (not outer) race of bearings.
3. Drive the two dowel pins back into position in the right-hand housing half (adapter mounting side). Place housing half on blocks to allow clearance. Put the output hub bearing cup in place, make certain that it is properly seated in the housing.
4. Mesh output hub and input shaft together and place in housing half. Tap lightly with a soft hammer (rawhide not lead hammer) until bearings are properly seated in housing. Make sure that the snap rings on the O.D. of the bearings come into contact with the housing.
5. Clean housing flange surfaces on both halves, making sure not to nick or scratch flange face. Place a new bead of gasket replacer on flange face and spread evenly over the entire flange leaving no bare spots.
6. Place output hub bearing cup in other housing half. Make sure cup is properly seated in housing. Place housing half in position over dowel pins and tap with a soft hammer (rawhide not lead hammer) until housing halves are together. Install housing bolts and tighten evenly. The final wrench torque for housing bolts is listed in Table 3.
7. Install the output hub seal carrier and the shims removed at disassembly. Tighten carrier cap screws while rotating the output hub to make sure the bearings do not bind. If the bearings start to bind, add more shims. Torque the carrier bolts to the value shown in Table 3. Attach an indicator to the housing and set the gauge on the top end of the output hub. Insert a pry bar under the other end of the hub and force it upward. The axial end play of the output hub will be given by the indicator reading. Add or remove shim stock to attain a reading of from .001" to .003". Remove seal carrier and place a 1/8" diameter bead of Dow Corning RTV732 sealant on the face around the I.D. of the last shim (sealant is to be between shim and reducer housing). Reinstall output hub seal carrier and tighten carrier screws to torque shown in Table 3.
8. Install oil seals. Extreme care must be observed when installing seals on input shaft and output hub to avoid contact with any sharp edges. Damage and consequent oil leakage can be decreased by covering all sharp edges with adhesive tape or paper before installing seals. Chamfer or de-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 evenly into place with a soft hammer, applying force only on the outer edge of the seals. A slight oil leakage may be evident at the seals during initial running in, but will disappear unless seals have been damaged.
9. Reassemble and install the Screw Conveyor Drive in accordance with the instructions in the front of this manual.

TABLE 3 — BOLT TIGHTENING TORQUE VALUES

SCREW CONVEYOR DRIVE SIZE	Housing Bolts (in.-lbs.)	Adapter Bolts (in.-lbs.)	Shaft Retainer Bolt (in.-lbs.)	Output Hub Seal Carrier Bolts (in.-lbs.)
SCXT 105	360	360	1800	200
SCXT 205	360	600	1800	360

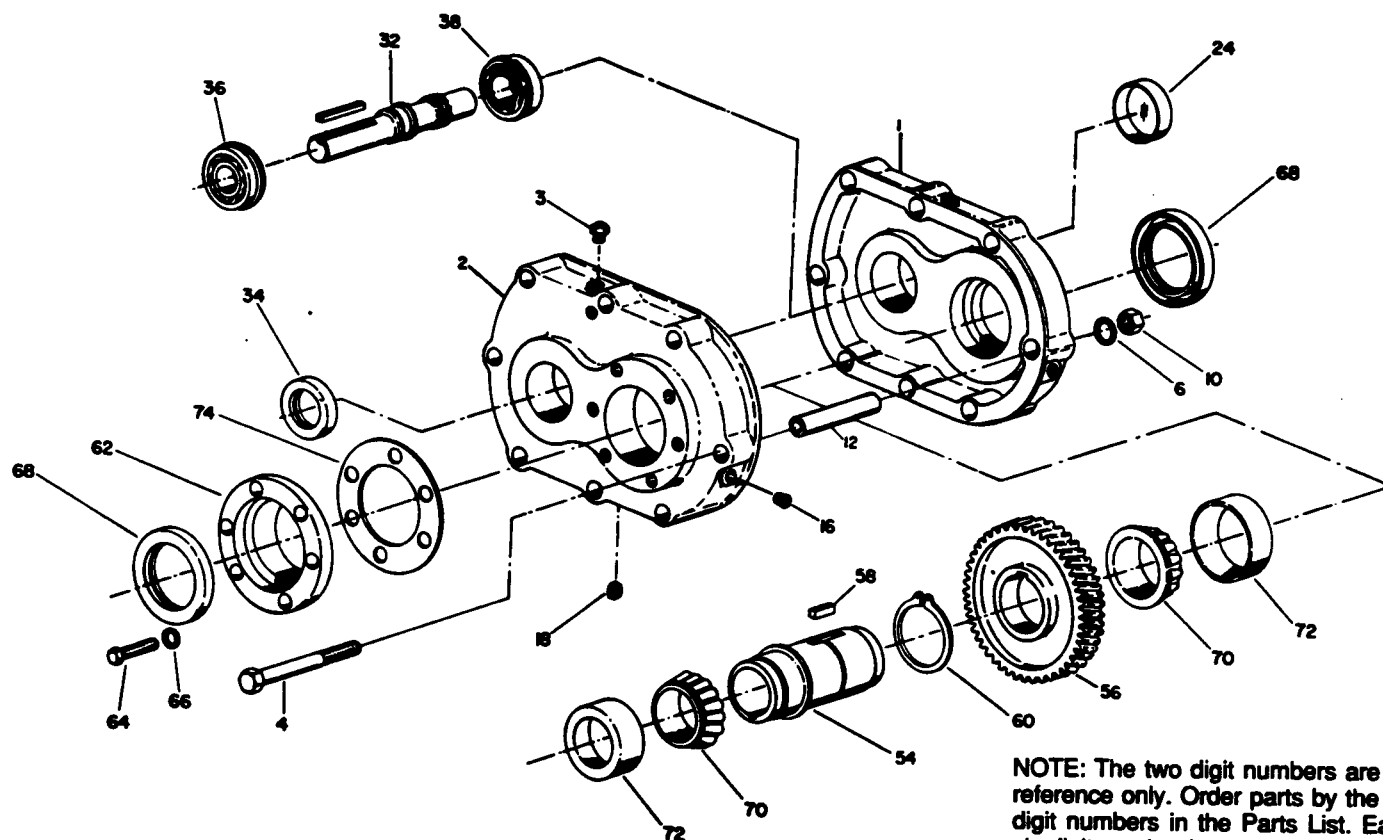
TABLE 4 — MANUFACTURERS' PART NUMBER FOR REPLACEMENT OUTPUT HUB BEARINGS

SCREW CONVEYOR DRIVE SIZE	Output Hub Bearing			
	DODGE Part Number		Timken Part Number	
	Cone	Cup	Cone	Cup
SCXT 105	390804	390809	JLM506849	JLM506810
SCXT 205	390812	390816	JLM710949	JLM710910

TABLE 5 — MANUFACTURERS' PART NUMBERS FOR REPLACEMENT INPUT SHAFT BEARINGS

SCREW CONVEYOR DRIVE SIZE	Input Shaft Bearing Input Side		Input Shaft Bearing Adapter Side	
	DODGE Part Number	SKF Part Number	DODGE Part Number	SKF Part Number
SCXT 105	424076	6206NR	424012	6304
SCXT 205	424078	6208NR	424000	305NR

PARTS FOR SCXT 105 AND SCXT 205 SCREW CONVEYOR DRIVE SPEED REDUCERS



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

PARTS FOR SCXT 105 AND SCXT 205 SCREW CONVEYOR SPEED REDUCERS

Reference	Name of Part	No. Req'd.	SCXT 105	SCXT 205
			Part No.	Part No.
	HOUSING	1	351235	352179
				
3	Air Vent	1	241237	241237
4	Housing Bolt	X	411418	411418
6	Lockwasher	1	419011	419011
↓	Washer	4	419092	419092
10	Hex Nut	X	407087	407087
12	Dowel Pin	2	420091	420091
16	Pipe Plug	5	430031	430031
18	Magnetic Drain Plug	1	430060	430060
24	Input Shaft Bearing Cover	1	361062	354112
↓	Retainer Bolt	1	411549	411549
↓	Lockwasher	1	419014	419014
↓	Shaft Retainer	1	351116	352116
32 *	Input Shaft and Pinion	1	251020	242214
*	Input Shaft Key	1	443013	443052
36 *	Input Shaft Bearing — Input Side Δ	1	424076	424078
38 *	Input Shaft Bearing — Adapter Side Δ	1	424012	424000
	OUTPUT HUB ASSEMBLY *	1	391029	392105
54 *	▲ Output Hub	1	351112	352112
56 *	▲ Output Hub Gear	1	241007	242181
58 *	▲ Output Hub Gear Key	1	241217	443399
60 *	▲ Snap Ring	1	421013	421017
62	Output Hub Seal Carrier	1	351114	362051
64	Carrier Screw	6	411405	411407
66	Lockwasher	6	419010	419011
70 *	Output Hub Bearing — Cone Δ	2	390804	390812
72 *	Output Hub Bearing — Cup Δ	2	390809	390816
74	Output Hub Shim Pack	1 Set	391056	392160
↓	ADAPTER * { "A" ASSEMBLY ■ "B" ASSEMBLY	1	351086	352052
↓	▲ Bolt	1	351087	352053
↓	▲ Lockwasher	4	411408	411433
↓	▲ Lip Seal	4	419011	419012
↓	▲ Lip Seal	1	351123	352122
↓	▲ Braided Seal	2	427663	427659
↓	▲ Seal Retaining Ring	1	351121	352121
↓	DRIVE SHAFT * { 1½" Dia. 2" Dia. 27/16" Dia. 3" Dia. 37/16" Dia.	1	351094	352090
		1	351095	352091
		1	351096	352092
		1	351097	352093
		1		
↓	▲ Key	1	443287	443223
	SEAL KIT * RECOMMENDED	1	272716	272717
34	▲ Input Seal	1	242211	252063
68	▲ Output Seal	2	351113	352113
14	▲ Housing Gasket *	1	241219	242219

- * Includes parts listed immediately below marked "Δ".
- ▲ These parts make up the assemblies under which they are listed.
- Δ For manufacturers' part number see Tables 4 and 5 on page 5.
- ↓ Not shown on drawing.
- 1 4 req'd. for SCXT 105; 5 req'd. for SCXT 205.
- Used only on SCXT 105 and SCXT 205 with 1½" dia. shafts.
- X 6 req'd. SCXT 105; 7 req'd. SCXT 205.
- * Recommended spare parts.
- § For input shafts originally supplied with snap ring.

