

Instruction Manual

For

DODGE® TORQUE-ARM™

Speed Reducers

Straight Bore & Taper Bushed

SIZES: TXT609 - TXT615 - TXT625
TXT709 - TXT715 - TXT725

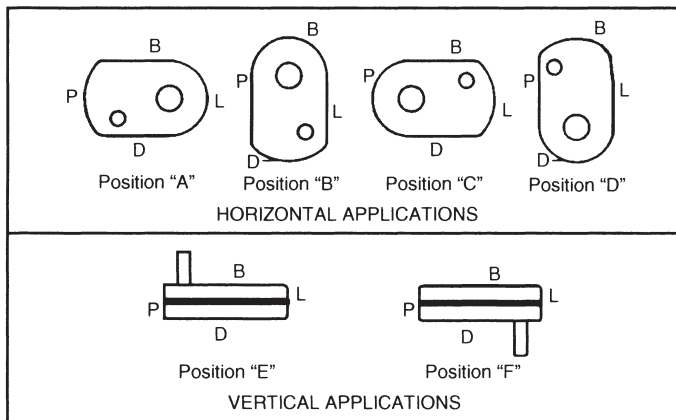
WARNING: Because of the possible danger to persons(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, 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.

INSTALLATION

1. For TXT7 replace the plastic plug that protects the threaded hole in the reducer housing with the eyebolt supplied with the reducer. Use the lifting lug for TXT6.
2. Determine the running position of the reducer. (See Fig. 1) Note that the reducer is supplied with either 4 or 7 plugs; 4 around the sides for horizontal installations and 1 on each face for vertical installations. These 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 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.



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

Fig. 1 — Mounting Positions

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° either way from position "B" or "D" in Fig. 1 sketches, or 5° either way from position "A" or "C," 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.

3. Mount reducer on driven shaft as follows:

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.

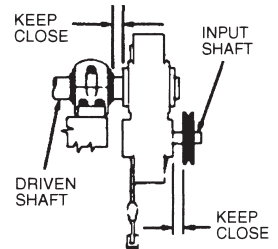


Fig. 2

For Taper Bushed: Mount reducer on driven shaft per instruction sheet No. 499629 packed with tapered bushings.

4. Install sheave on input shaft as close to reducer as practical. (See Fig. 2)
5. Install motor and V-belt drive so belt pull will approximately be at right angles to the center line between driven and input shaft. (See Fig. 3) This will permit tightening the V-belt drive with the torque arm.
6. Install torque arm and adapter plates using the long reducer bolts. The bolts may be shifted to any of the holes on the input end of the reducer.

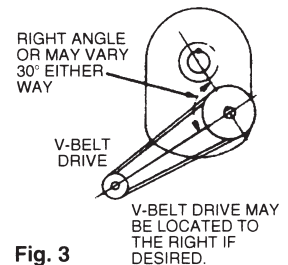


Fig. 3

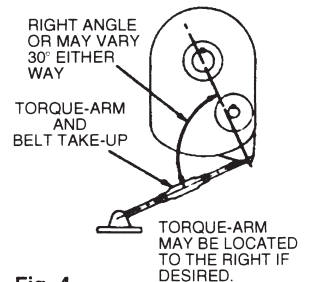


Fig. 4

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. 4) Make sure that there is sufficient take-up in the turnbuckle for belt tension adjustment when using V-belt drive.

LUBRICATION

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.

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 regularly.

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.

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.

CAUTION

Do not use 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.

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)
TXT609 TXT615 TXT625	136	4 ¹ / ₄	4.0	160	5	4.7	136	4 ¹ / ₄	4.0	160	5	4.7	276	8 ⁵ / ₈	8.2	292	9 ¹ / ₈	8.6
TXT709 TXT715 TXT725	208	6 ¹ / ₂	6.1	256	8	7.6	232	7 ¹ / ₄	6.9	296	9 ¹ / ₄	8.7	492	15 ³ / ₈	14.6	524	16 ³ / ₈	15.5

† 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	150	
201-300	220	220	150	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	150	
126-150	220	220	220	150	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	150	
81-100	220	220	220	220	220	150	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	150	
11-40	220	220	220	220	220	220	220	220	220	220	150	150	150	150	150	
1-10	220	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.

		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	220	
201-300	320	320	220	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	220	
126-150	320	320	320	220	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	220	
81-100	320	320	320	320	320	220	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	220	
11-40	320	320	320	320	320	320	320	320	320	320	220	220	220	220	220	
1-10	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320	

NOTE:

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

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

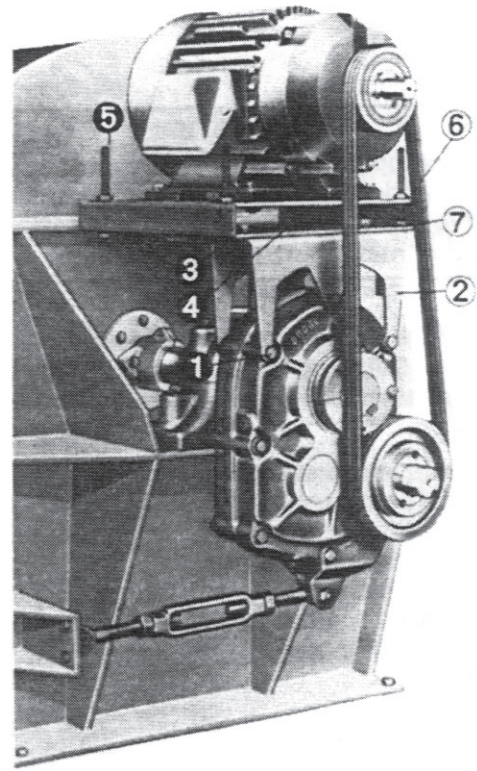
INSTALLATION

Note: Refer to photo for position of all parts before installation.

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.

1. Remove the two or three bolts required for mounting the TAM Motor Mount from the reducer housing. Install the front and rear supports (2) using the new reducer bolts (1) supplied with the motor mount. Make sure support flanges face output side of reducer. Tighten bolts securely.
2. Mount bottom plate (3) on supports with bolts supplied. Insert bolts (7) from top through slotted holes. Add flatwasher, lockwasher, and nut. Hand tighten.
3. Thread two nuts (6) on each threaded stud (5) leaving approximately 1" of stud protruding at one end. Insert threaded stud with 1" of threads through corner holes of bottom plate, thread a hex nut (6) on the stud and tighten securely.
4. Slide top plate (4) over the threaded stud, making sure center handling hole is positioned opposite input side of reducer. Thread a hex nut (6) on the studs and tighten securely.
5. Locate the proper position for the motor and bolt it to the top plate. Tighten bolts securely.
6. Install motor sheave and reducer sheave as close to motor and reducer housings as possible. Accurately align the motor and reducer sheave by sliding bottom plate in relation to supports. Tighten bolts (7) securely.



7. Install V-belts and tension belts by alternately adjusting nuts (6) on the threaded studs (jackscrews). Make certain that all bolts are securely tightened, the V-belt drive is properly aligned and the belt guard is installed before operating the drive.

WARNING

Ensure that all guards are properly installed before proceeding. Exercise extreme care to avoid contacting rotating parts. Failure to observe this precaution may result in bodily injury.

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.)
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 of 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

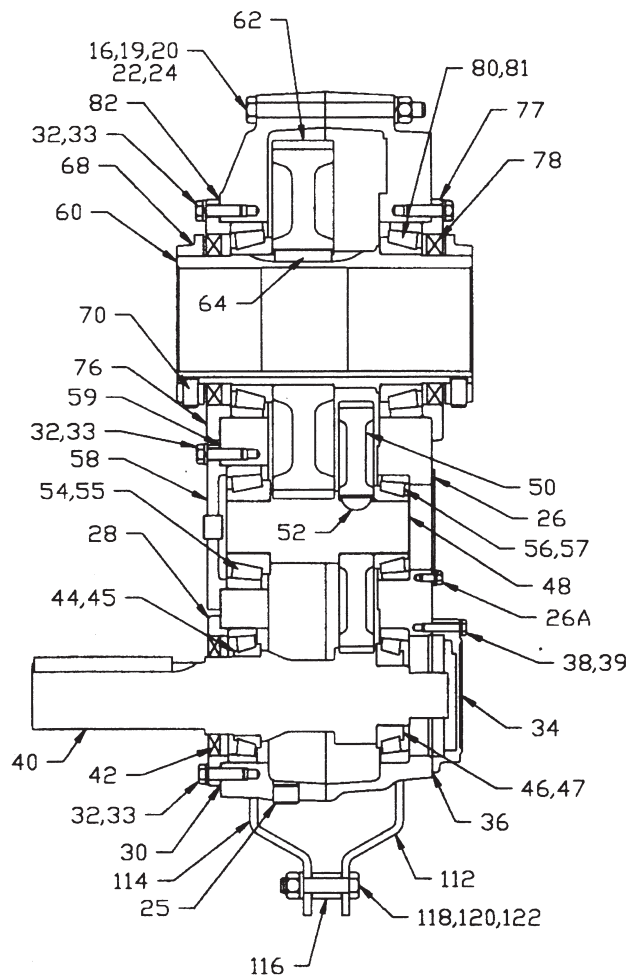
1. Assemble the vent plug into the proper hole.
2. Clean the shaft extensions with a suitable solvent.
3. Fill the unit to the proper oil level using a recommended lubricant. The VCI oil will not affect the new lubricant.
4. Follow the installation instructions provided in this manual.

Quantities of VCI #105 Oil DODGE Part Number 415112-80-DB

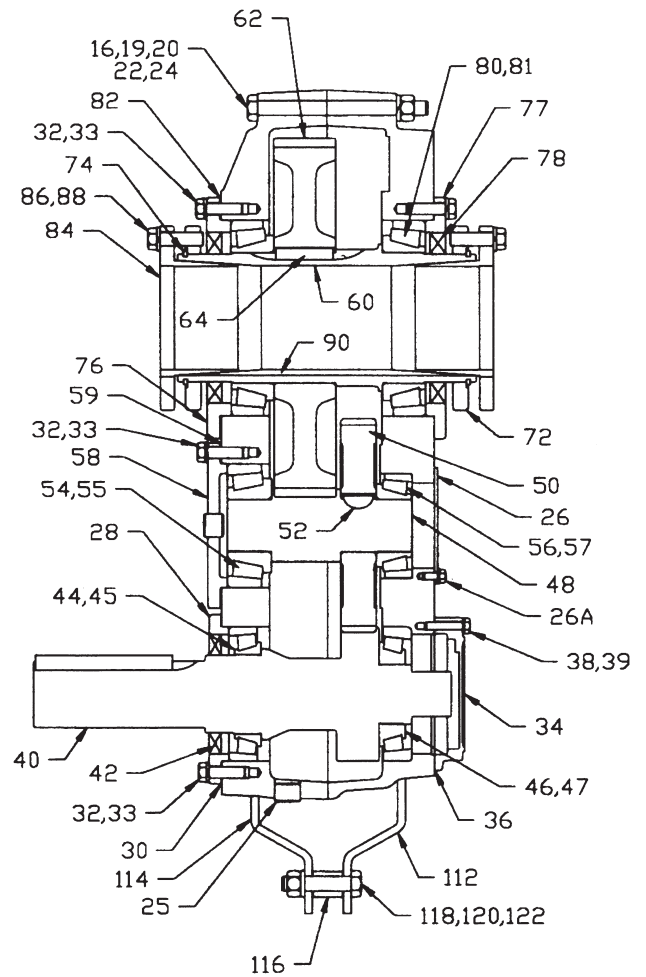
Case Size	Quarts or Liters
TXT6	.4
TXT7	.5

VCI #105 & #10 are interchangeable.
VCI #105 is more readily available.

PARTS FOR TXT6 AND TXT7 STRAIGHT BORE & TAPER BUSHED SPEED REDUCERS

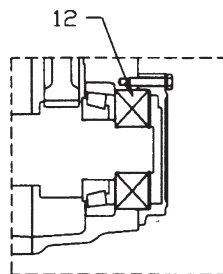


Straight Bore

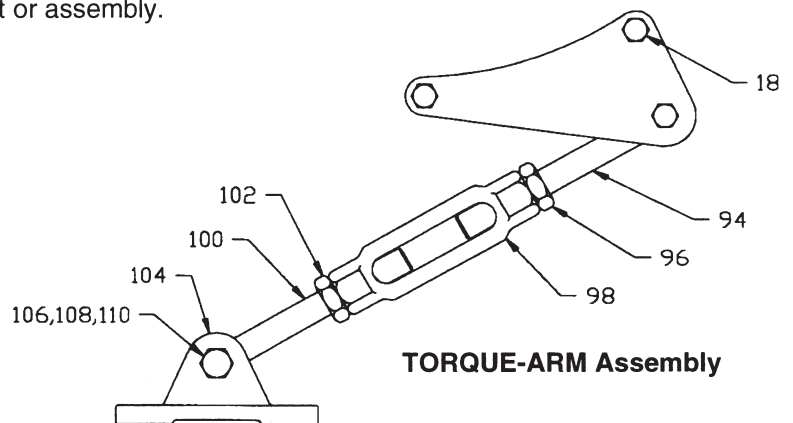


Taper Bushed

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.



Backstop Assembly



TORQUE-ARM Assembly

Refer- ence	Name of Part	No. Req'd.	TXT6 Part No.	TXT7 Part No.	Refer- ence	Name of Part	No. Req'd.	TXT6 Part No.	TXT7 Part No.
	HOUSING	1	246170	247180	82*	Output Hub Bearing Shim Pack	2‡	391187	390444
◇ 16 18 19	Air Vent Housing Bolt Adapter Housing Bolt Washer	1 6 2 2	245237 411466 411468 419096	390061 411498 411499 419082	36* 42* 78*	SEAL KIT★ * ▲Backstop Cover Gasket ▲Input Shaft Seal ▲Output Hub Seal	1 1 1 2	246340 246220 242210 246310	247345 246220 242210 247310
20 22 24 ◇ 25 26 26A	Lockwasher Hex Nut Dowel Pin Pipe Plug Magnetic Plug Countershaft Brg. Cover (Backstop Side) Countershaft Cover Screws Countershaft Cover Washers	8 8 2 2 1 1 6 6	419013 407091 420112 430033 430062 246015 411394 419009	419016 407095 420128 430035 430064 247011 411394 419009	◇ 				

* Includes parts listed immediately below marked "▲," TXT6 & TXT7 housing assembly also includes a two-piece housing. Bushing assemblies include 2 bushings.

▲ Parts marked "▲" make up the assemblies under which they are listed.

◇ Not shown on drawing.

‡ One set consists of one each of the shims listed immediately below marked "‡."

† See last paragraph under "ORDERING PARTS."

◆ Straight bore only.

■ Taper bushed only.

+ 24 required on TXT6; 28 required on TXT7.

* Recommended spare parts.

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 used during disassembly and reassembly to avoid damage to the surface 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 also be replaced.

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 ensure 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 seals 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:

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.

WARNING

Equipment being removed may be too heavy to control manually. Support it by extreme means. Failure to observe these precautions could result in bodily injury.

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.

TAPER BUSHED —

1. Remove bushing screws.
2. Place the screws in the threaded holes provided in the bushing flanges. Tighten the screws alternately and evenly until the bushings are free on the shaft. For ease of tightening screws make sure screw threads and threaded holes in bushing flanges are clean.
3. Remove the outside bushing, the reducer and then the inboard bushing.

DISASSEMBLY:

1. Remove all bolts from housing. Drive back hollow dowel pins on either side of housing. Remove back-up plates and snap rings on the output hub on taper bushed reducers. Open housing evenly 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:

1. **Output Hub Assembly:** Heat gear to 325° to 350° F for shrinking onto output hub. Heat bearing cones to 270° to 290° F for shrinking onto output hub.
2. **Countershaft Assembly:** Heat gear to 325° to 350° F and bearing cones to 270° to 290° F for shrinking onto shaft.
3. **Input Shaft Assembly:** Shaft and pinion are integral. Heat bearing cones to 270° to 290° F for shrinking onto shaft.
4. Drive the dowel pins back into position in the right-hand housing half. Place a .010" shim on the output hub seal carrier for the right-hand housing half (adapter mounting side). Place a 1/8" diameter bead of Dow Corning RTV732 sealant 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 output hub seal carrier in housing half and tighten bolts to torque value shown on table 3 on page 8.

5. Install countershaft cover in right-hand housing half. Place housing half on blocks to allow for protruding end of output hub. Install bearing cups in right-hand housing half making sure they are properly seated.
6. Mesh output hub gear and small countershaft gear together and set in place in housing. Set input shaft

assembly in place in the housing. Make sure bearing rollers (cones) are properly seated in their cups. Set bearing cups for left-hand housing half in place on their rollers.

7. 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 other housing half into position and tap with a soft hammer (rawhide, not lead hammer) until housing bolts can be used to draw housing halves together. Torque housing bolts per torque values listed below:
8. Place output hub seal carrier in position without shims and install two carrier screws diametrically opposed. Torque each screw to 25 lb.-ins. Rotate the output hub to roll in the bearings and then torque each screw once to 50 lb.-ins. **Do not retorque screws.** Again turn output hub to roll in the bearings. With a feeler or taper gage, measure the gap between the housing and the carrier, clockwise from and next to each screw. To determine the required shim thickness, add the average of the two feeler gage readings to the constant given in Table 4. Remove carrier and install the required shims. Note: Total shim thickness per carrier should not include more than .009" 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 I.D. of the end shim (sealant is to be between reducer housing and shim) and install carrier on reducer housing. Torque carrier bolts to value shown in Table 3. Output hub should have an axial end play of .001" to .003".

Table 3—Torque Values

Reducer Size	Recommended Torque (lb.-ins.)			
	Housing Bolts	Ctrshft. Brg. Cover Screws	Output Hub Seal Carrier Screws	Input Brg. Cover Screws
TXT6	900	360	360	120
TXT7	1620	600	600	120

Table 4—Shim Pack Constant Dimension

Shim Pack Location	TXT615 TXT625	TXT715 TXT725
Output Hub Seal Carrier	.013"	.009"
Countershaft Cover	.013"	.013"
Input Shaft Seal Carrier	.016"	.016"

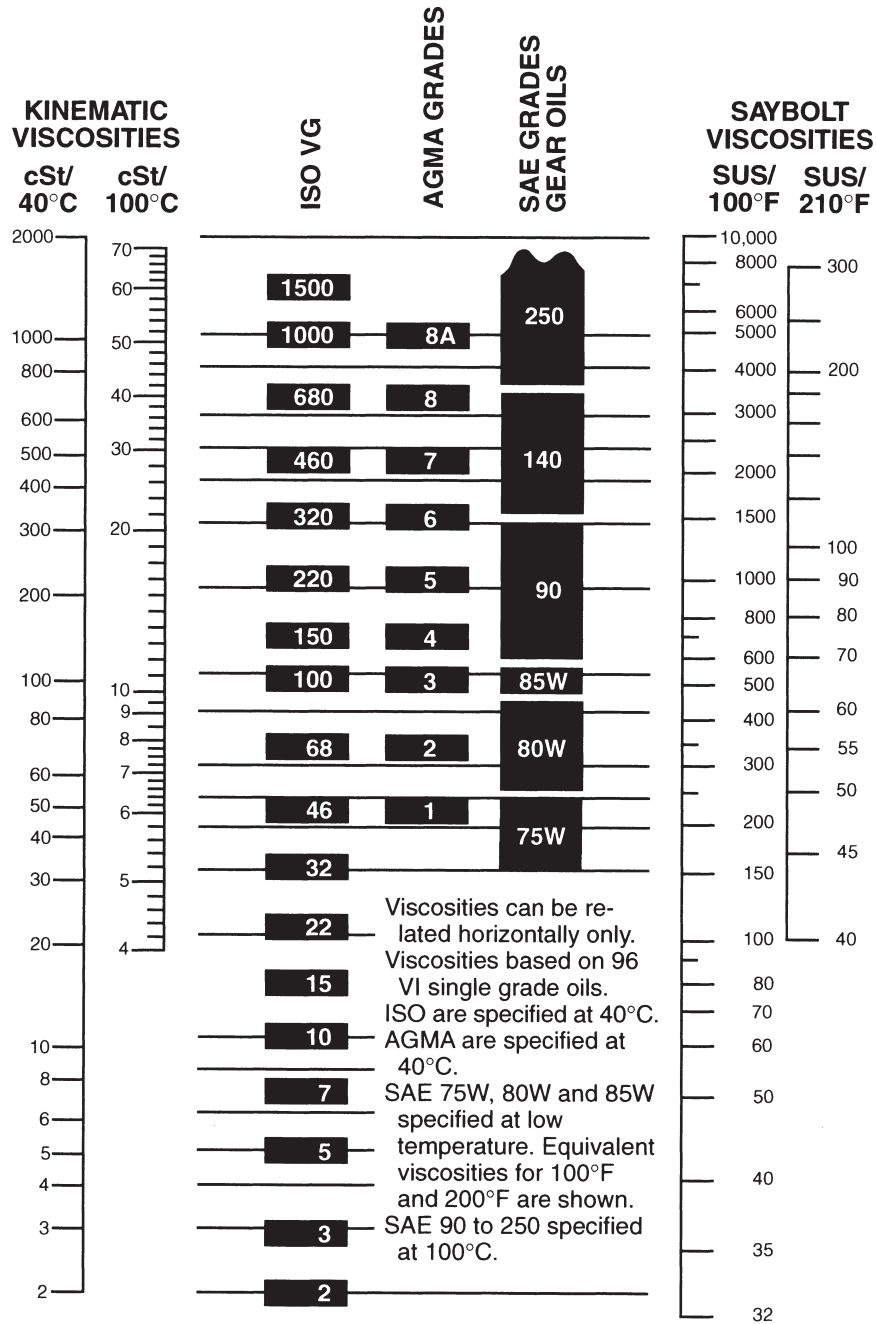
9. Adjust the countershaft bearings using the same method as in step 8, above, except add the average of the feeler gage reading to the constant shown for the countershaft in Table 4 and the axial end play should be .001" to .003".
10. Again using the same procedure as in step 8, adjust the input shaft bearings, except the axial end play should be .002" to .003".
11. Apply sealant to the input shaft cover gasket and install input shaft cover in right-hand housing half. Install input and output seals. Extreme care should be used when installing seals to avoid damage due to contact with any sharp edges on the input shaft or output hub. This damage and consequent oil leakage can be decreased by covering all sharp edges with tape or paper prior to seal installation. Fill cavity between seal lips with grease. Seals should be pressed or tapped with a soft hammer evenly into place in the carrier applying pressure only on the outer edge of the seals. A slight oil leakage at the seals may be evident during initial running in but should disappear unless seals have been damaged.
12. Install bushing back-up plate and snap rings on Taper Bushed reducers.

Table 5—Manufacturers Part Numbers for Replacement Bearings

TORQUE-ARM REDUCER DRIVE SIZE	Output Hub Bearing			
	DODGE Part Number Cone	Cup	Timken* Part Number Cone	Cup
TXT615 TXT625	402050	403140	JM822049	JM822010
TXT715 TXT725	402058	403111	48290	48220
Countershaft Bearing—Input Side				
TXT615 TXT625	402054	403159	HM807040	HM807010
TXT715 TXT725	402256	403053	JHM807045	JHM807012
Countershaft Bearing—Adapter Side				
TXT615 TXT625	402052	403142	HM803149	HM803110
TXT715 TXT725	402256	403053	JHM807045	JHM807012
Input Shaft Bearing—Input Side				
TXT615 TXT625	402196	403091	395A	3920
TXT715 TXT725	402150	403106	39590	39520
Input Shaft Bearing—Adapter Side				
TXT615 TXT625	402197	403091	396	3920
TXT715 TXT725	402088	403047	455	452

*Registered TIMKEN Co. TM

VISCOSITY CLASSIFICATION EQUIVALENTS





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

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