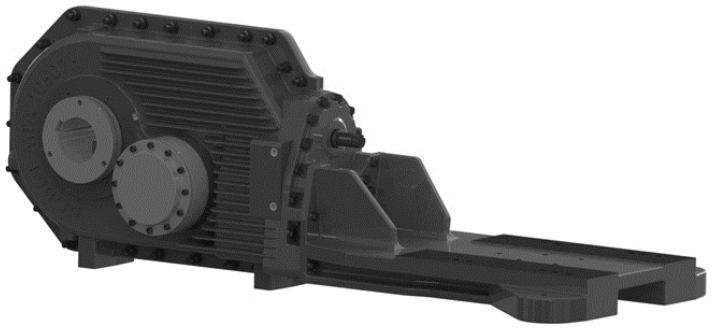
Motorized Torque-Arm II Speed Reducers for Foot-Mounted Motors (MTA7-MTA12)

Instruction Manual

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

WARNING: To ensure the 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: All products over 25 kg (55 lb) are noted on the shipping package. Proper lifting practices are required for these products.



INSTALLATION OF FOOT-MOUNTED MOTOR ADAPTER AND RAPTOR COUPLING (NEMA 360T-447T)

1. Use lifting bracket(s) to lift reducer onto worktable and secure the reducer to prevent movement.
2. Inspect the motor adapter and reducer to ensure there are no burrs or debris present on the contact surfaces of each part.
3. Lift the motor adapter using lift-assist equipment and position the motor adapter onto the reducer and secure using the supplied hardware. The foot-mounted motor adapters attach to the reducer using fourteen bolts and fourteen lock washers.
4. Torque motor adapter to reducer bolts per Table 1.
5. Inspect coupling components and remove any protective coatings/lubricants from bores, mating surfaces, and fasteners.
6. Install the reducer hub with key. For NEMA 360T frame motors, the hubs should be in the inboard configuration. (Figure 1) For all other frame sizes, the hubs should be in the outboard configuration. Axially locate the end of the hub relative to the end of the reducer shaft per Table 2a and shown in Figure 2a. Tighten the set screws per Dodge Raptor manual MN4062.

   NOTE: Improper axial location of the reducer coupling hub may lead to interference between rotating components and static guarding or insufficient engagement of the motor shaft into the motor coupling.

Table 1: Motor Adapter to Reducer Tightening Torque

Fastener Size	Bolt Tightening Torque
5/8-11 GR8	160 lb-ft (217 N-m)

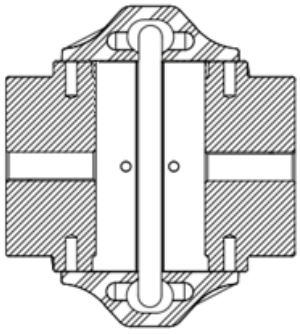


Figure 1 - Raptor Hubs in Outboard Configuration

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

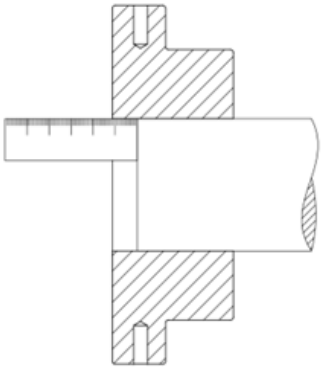


Figure 2a - Measurement to Axial Location of Hub

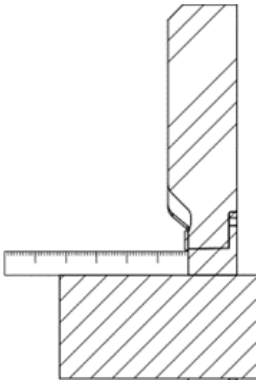


Figure 2b - Measurement of Axial Location of Fan Hub

Table 2a: Axial Position of Reducer Coupling Hub

NEMA Frame	Coupling Hub Distance from Shaft End				
	MTA7	MTA8	MTA9	MTA10	MTA12
360T	Flush	Flush	0.71"	0.74"	0.61"
405T	Flush	Flush	Flush	Flush	Flush
444T	–	–	0.18"	0.21"	Flush
445T	–	–	–	0.40	0.27
447T	–	–	–	–	0.27

7. If applicable, slide the shaft fan onto the motor shaft to the axial location defined in Table 2b and torque the set screws to 25 lb-in (2.8 N-m)

   NOTE: The dimensions shown in Table 2b are to the fan hub, not the fan blade retaining ring. See Figure 2b.
8. Install the motor hub with key in the outboard orientation. It's good practice to align the face of the hub to the face of the motor shaft at this time, then use instructions from the next step to set the hub distance. Do not tighten the set screws.
9. Lift the motor using lift-assist equipment and position it onto the foot-mounted motor adapter. Hub spacing distance on reducer coupling to motor coupling can be seen in Table 4. The hub will need to be adjusted axially on the motor shaft to achieve correct hub spacing as well as alignment of motor feet holes to the correct holes in the motor adapter. Ensure proper engagement length of motor hub to motor shaft. For more information on hub spacing, reference Dodge Raptor manual MN4062. Secure using the supplied hardware.
10. Use shims to align the motor shaft to th reducer input shaft. Shims must be uniformly distributed on the feet to avoid any distortion or localized stress on the lower housing. Use shims large enough to provide adequate support. If shims are not installed properly, they may get disloged from their location which will cause severe misalignment in the system, potentially resulting in severe damage to all the components in the system.
11. After the couplings have been aligned, tighten the motor hold-down bolts to the torque values appropriate for the bolt sizes per Table 3 and recheck the alignment.

    NOTE: Raptor couplings have high misalignment capabilities. However, excessive misalignment may be detrimental to the mechanical components of the motor and the reducer. Coupling hubs can be aligned using scales, straight edges, or calipers, however; dial indicators, laser alignment tools, or other precision alignment equipment is recommended.
12. Finish installing the Raptor coupling per Figure 3. For coupling installation instructions, refer to the Dodge manual MN4062.

Table 2b: Axial Position of Fan Hub

NEMA Frame	Fan Hub Distance from Shaft End
360T	3.36"
405T	4.74"
444T	6.11"
445T	6.11"
447T	6.11"

Table 3: Motor Hold-Down Bolt Tightening Torque

NEMA Frame	Motor Bolt	Bolt Tightening Torque
360T	5/8-11	110 lb-ft (36 N-m)
405T -440T	3/4-10	200 lb-ft (271 N-m)

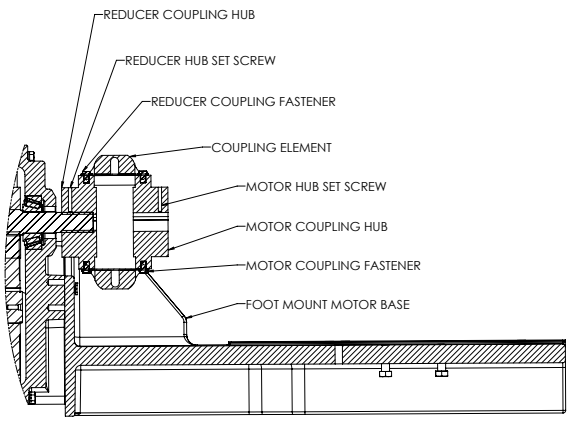


Figure 3 - Measurement to Axial Location of Hub

Table 4: Reducer Hub to Motor Hub Spacing Distance

NEMA Frame	Hub Spacing Distance
360T or 405T	3.29"
444T or 445T	3.91"
447T	4.23"

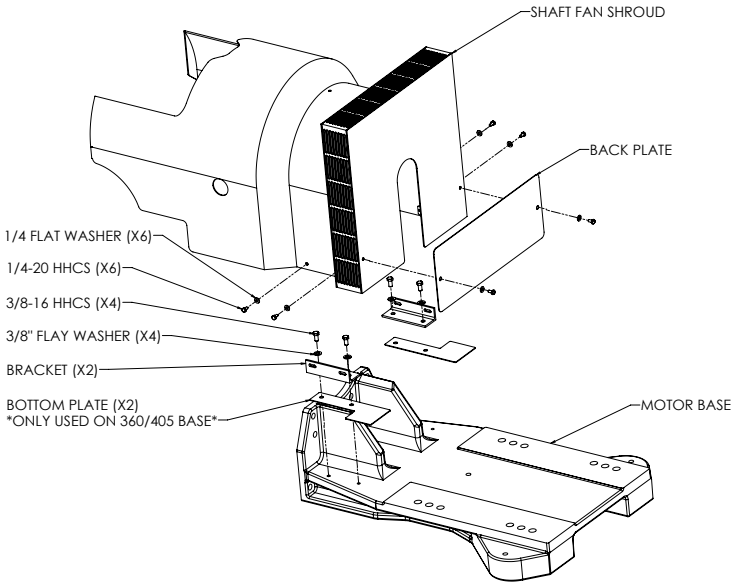


Figure 4 - Coupling Guard/Shaft Fan Shroud Assembly

REDUCER INSTALLATION

1. Use lift-assist equipment to lift the reducer using the lifting points indicated in Figure 5.

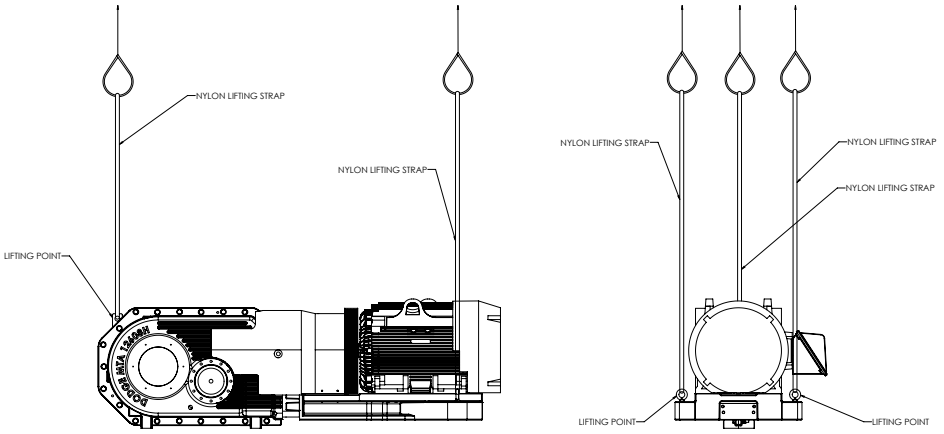


Figure 5 - MTA with Foot-Mounted Motor Lifting Points

2. The only recommended running position of an MTA reducer equipped with a foot-mounted motor is Position C, as shown in Figure 6. Note that the reducer is supplied with seven plugs: four around the sides for horizontal installations, two plugs on the front face, and one plug on the back face for vertical installations. These plugs must be arranged so that the filter breather is located in the hole closest to the top of the reducer and the magnetic plug is located in the hole closest to the bottom of the reducer. The highest hole on the side of the reducer is the minimum oil level plug.

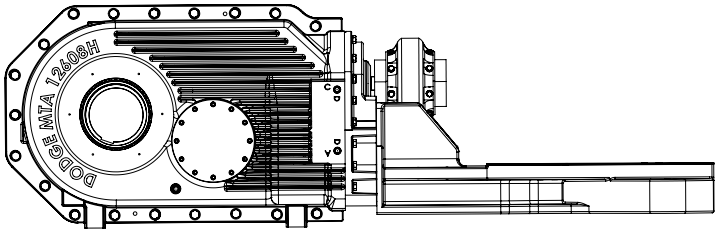


Figure 6 - Reducers with Foot-Mounted Motors Must Be Mounted in Position C as Shown

3. Mount reducer on the driven shaft with twin tapered bushings per Dodge manual MN1641.
4. Mount the tie rod as follows:
   - **MTA7–MTA8:** Reusing the existing reducer bolts, install the adapter plates in any suitable location on the flange of the reducer. Mount the rod assembly with the hardware included in the rod kit. Install the torque-arm fulcrum on a flat and rigid support so that the torque arm will be approximately at right angles to the centerline through the driven shaft and the torque-arm anchor screw.

- **MTA9–MTA12 with a 360/405T Motor Adapter:** Assemble the tie rod extension beam to the reducer per instruction in the tie rod support beam installation section of this manual.
- MTA9–MTA12 with a 440T Motor Adapter: Assemble the tie rod assembly directly to the bottom of the foot-mounted motor adapter using the hardware included with the rod kit. Install the other torque arm fulcrum to a flat and rigid support. The torque arm should be vertical and perpendicular to the support beam. Failure to follow these guidelines may result in damage to the gearbox or the driven equipment.

5. Fill the gear reducer with recommended lubricant. See Tables 6 and 7.

Table 6: Approximate C Position Oil Volumes

Reducer Size	Quarts	Liters
MTA7315H	19-5/8	18.5
MTA8407H	22-5/8	21.4
MTA9415H	36	34
MTA10507H	50-1/2	47.8
MTA12608H	90	67.8

Table 7: Oil Recommendations

ISO Grades for Ambient Temperatures of 50 °F to 125 °F (10 °C to 50 °C)					
Output RPM	Torque-Arm II Reducer Size				
	MTA7315H	MTA8407H	MTA9415H	MTA10507H	MTA12608H
151 – 200	220	220	220	220	220
126 – 150	220	220	220	220	220
101 – 125	220	220	220	220	220
81 – 100	220	220	220	220	220
41 – 80	220	220	220	220	220
11 – 40	320	320	320	220	220
1 – 10	320	320	320	320	320
ISO Grades for Ambient Temperatures of 15 °F to 60 °F (-9.4 °C to 15 °C)					
Output RPM	Torque-Arm II Reducer Size				
	MTA7315H	MTA8407H	MTA9415H	MTA10507H	MTA12608H
151 – 200	150	150	150	150	150
126 – 150	150	150	150	150	150
101 – 125	150	150	150	150	150
81 – 100	150	150	150	150	150
41 – 80	150	150	150	150	150
11 – 40	220	220	220	150	150
1 – 10	220	220	220	220	220

①Usage of the foot-mounted motor adapters in reducer positions other than C is strongly discouraged.
②Oil quantity is approximate. Service with lubricant until oil runs out of level hole as indicated per drawings in Figure 2.
③US measure: 1 quart = 32 fluid ounces = 0.95 liters

Notes:
1. Assumes auxiliary cooling where recommended in the catalog.
2. Pour point of lubricant selected should be at least 10 °F (6 °C) lower than the expected minimum ambient starting temperature.
3. Extreme pressure (EP) lubricants are not necessary for average operating conditions. When properly selected for specific applications, Torque-Arm II backstops are suitable for use with EP lubricants.
4. 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 recommendations.
5. For reducers operating in ambient temperatures between -22 °F (-30 °C) and 20 °F (-6.6 °C) use a synthetic hydrocarbon lubricant, 100 ISO grade or AGMA 3 grade (for example, Mobil SHC 627). Above 125 °F (51 °C), consult Dodge Gearing Application Engineering +1 864 288 9050 for lubrication recommendations.
6. Mobil SHC 630 Series oil is recommended for high ambient temperatures.

LUBRICATION

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

Under average industrial operating conditions, the lubricant should be changed every 2500 hours of operation or every six months, whichever occurs first. Drain reducer and flush with kerosene, clean magnetic drain plug, and refill to the proper level with new lubricant. After an initial operation of about two weeks, the oil should be changed. If desired, this oil may be filtered and reused. Very often, small metal particles will show up in the oil due to the wearing-in process. After the initial break-in period, the lubricant should be drained, the magnetic drain plug cleaned, and the gear case flushed and refilled every 2500 hours of operation under average industrial conditions.

CAUTION: Too much oil will cause overheating and too little will result in gear failure. Check the oil level regularly. Failure to observe this precaution could result in damage to the reducer.

Under extreme operating conditions, such as the rapid rise and fall of temperature, dust, dirt, chemical particles, chemical fumes, or oil sump temperatures above 200 °F (90 °C), the oil should be changed every one to threee months, depending on the severity of conditions.

CAUTION: Unit is shipped without oil. Add the proper amount of recommended lubricant before operating. Failure to observe this precaution could result in damage to or destruction of the equipment.

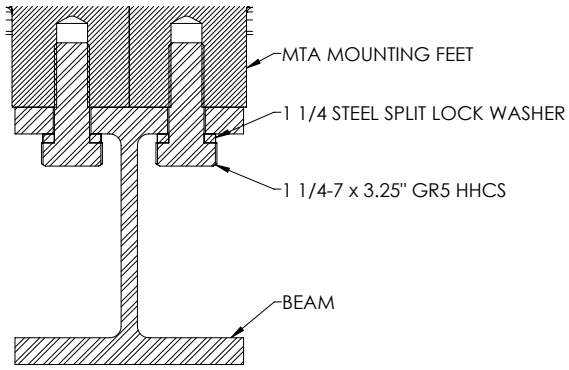


Figure 7 - Beam to Reducer Assembly Hardware

REDUCER INSTALLATION

Motorized Torque-Arm II reducer sizes 9, 10, and 12 is designed to be used with a tie rod support beam which extends to a location further from the driven shaft that would have been possible with a standard flange-mounted tie rod. The increased mounting distance reduces system reaction forces on the driven shaft. Use of a flange-mounted tie rod for sizes 9, 10, and 12 is not recommended.

BEAM SUPPORTED TIE ROD INSTALLATION

1. To install the beam to the reducer, use appropriate lifting equipment properly designed to safely lift the beam into position. The beam should extend toward the motor end of the reducer, Figure 9. Improper mounting direction (Figure 10) will result in increased forces on the driven shaft and may result in damage to the gearbox or the driven equipment.
2. Assemble the beam to the reducer, Figure 8 using the hardware specified in Table 8, tightening each bolt lightly.
3. Align the beam with the housing flange and torque the bolts to the values shwon in Table 8.
4. Install one torque-arm fulcum to the end of the beam using the appropriate hardware and torque values as specified in Table 8.
5. Install the other torque arm fulcrum to a flat and rigid support. The torque arm should be vertical and perpendicular to the support beam. Failure to follow these guidelines may result in damage to the gearbox or the driven equipment.

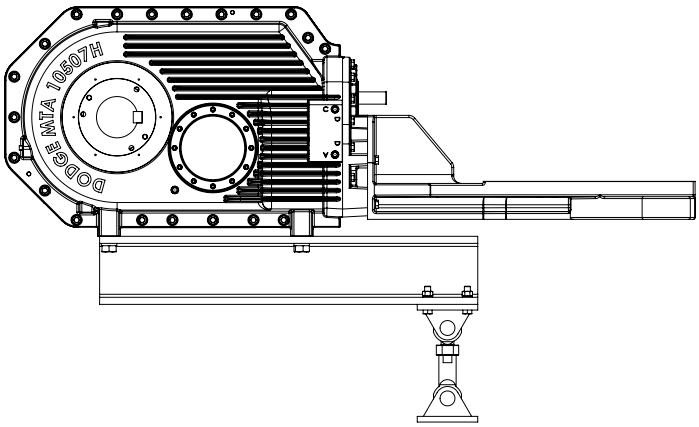


Figure 8 - Beam Mounted Correctly

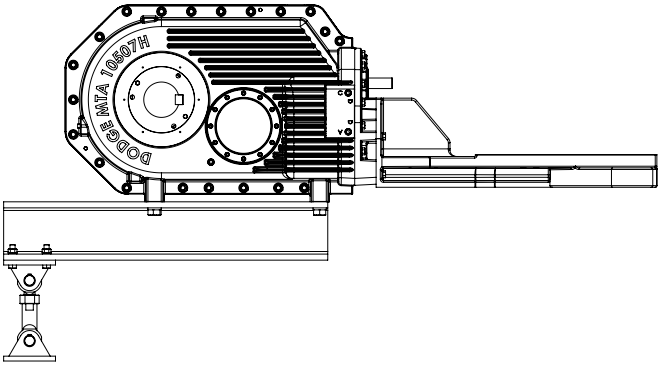


Figure 9 - Beam Mounted Incorrectly

Table 8: Tie Rod Beam Bolt Tightening Torque

Joint	Fastener Size	Torque (lb-ft)
Reducer	1 1/4 - 7 x 3.25	840
Torque-Arm fulcrum	3/4 - 10 x 3.5	240

STARTUP

CAUTION: Do not operate unit with caps, covers, or guards missing.

After the installation of the Motorized Torque-Arm II drive unit is completed, check the following to ensure safe operation of each Motorized Torque-Arm II drive.

1. Check the couplings connecting the drive motor to Motorized Torque-Arm II for proper alignment.
2. Check all mounting bolts, nuts, and screws to be sure they are tight.
3. Check the direction of rotation of all components.
4. Ensure that the breather, access covers, and coupling guards are in place and secured.
5. Check that the oil is up to the correct oil level hole.
6. If equipped, operate the Motorized Torque-Arm II cooling pump to circulate lubricating/cooling oil through the system. Purge air from the pump housing volute by loosening the plug at the top portion of the volute. Check the oil level again to be sure the oil is at the correct level with the pump running.
   IMPORTANT: Lubricant level checks should be done with the reducer not running, the reducer cool and the cooling pump running, if equipped.
7. If the Motorized Torque-Arm II has an external backstop, check that the direction of rotation of the backstop and output drive shaft is the same.

CAUTION: Too much oil will cause overheating and too little will result in gear failure. Check the oil level regularly. Failure to observe this precaution could result in damage to the reducer.

PREVENTIVE MAINTENANCE

All maintenance and repair work should be carried out by trained personnel. Perform the following maintenance at the recommended intervals.

First day of operation

- Check oil temperature - Sump temperature will vary based on operating conditions and cooling method. The gearbox is designed for a maximum oil sump temperature of 200 °F (93 °C). For water-cooled heat exchangers, the water flow rate can be adjusted to obtain the desired temperature. Flow rates in the higher range will reduce the oil sump temperature. Check with the cooler manufacturer to determine the allowable flow rates through the cooler.
- Check for changes in noise level
- Check for oil leaks

After the first two weeks or 300 hours of operation

- Check oil for water content
- Change oil
- Check mounting hardware is tight
- Check for oil leaks
- Clean and reinstall the magnetic drain plugs

Monthly

- Check oil level
- Change oil for water content
- Check for leakage
- Check oil temperature for changes
- Check for changes in noise level
- Check for dust/dirt build-up on exterior surfaces

Every 6 months or 2500 hours of operation

- Check oil for water content
- Change oil (synthetic oil every 18 months or 8000 hours)
- Check mounting hardware is tight
- Check for oil leaks
- Clean and reinstall the magnetic drain plugs
- Check the cooling system

Every 18 months or 8000 hours of operation for synthetic lubricant

- Check oil for water content
- Change oil
- Check mounting hardware is torqued
- Check for oil leaks
- Clean and reinstall the magnetic drain plugs
- Check the cooling system

Oil Analysis Program

Oil change intervals can be extended provided an oil analysis program is in effect. Increased contaminate values would indicate internal component wear is beginning to occur. The reducer should be monitored more frequently and may need to be removed from service for repair.

GUIDELINES FOR MOTORIZED TORQUE-ARM II REDUER 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 hte best condition when placed into service.

By taking special precautions, problems such as seal leakage and reducer failure due to 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 oil from the unit. Add a vapor phase corrosion inhibiting oil (VCI-105 oil by Daubert Chemical Co.) in accordance with Table 10.
2. Seal the unit airtight. Replace the vent plug with a standard pipe plug and wire the vent to the unit.
3. Cover all unpainted exterior parts with a waxy rust-preventative compound that will keep oxygen away from the bare metal (Non-Rust X-110 by Daubert Chemical Co. or equivalent).
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 that 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 dessicant material. If the reducer is to be stored outdoors, cover the entire exterior with a rust preventative.

When Placing the Reducer into Service

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

Table 10: Quantities of Corrosion Inhibitive Lubricating Liquid

Reducer Size	Quantity (oz/mL)
MTA7315H	3/89
MTA8407H	3/89
MTA9415H	4/118
MTA10507H	6/177
MTA12608H	8/237

VCI #105 and #10 are interchangeable

REPLACEMENT OF PARTS

NOTE: Using tools normally found in a maintenance department, a Motorized Torque-Arm II speed reducer can be disassembled and reassembled with 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. A tank of clean solvent, an arbor press, and equipment for heating bearings and gears (for shrinking these parts on shafts) should be available.

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 contact lip seals. Considerable care should be used during disassembly and reassembly to avoid damage to the surface on which the seals rub.

Any sharp edges on the output hub should be covered with tape or paper before disassembly or reassembly. Also, be careful to remove any burrs or nicks on the surfaces of the input shaft or output hub before disassembly or reassembly.

Ordering Parts: When ordering parts for the reducer, specify reducer size number, reducer model number, part name, part number, and quantity.

It is strongly recommended that, when a pinion or gear is replaced, the mating pinion or gear is replaced also. If the large gear on the output hub must be replaced, it is recommended that an output hub assembly consisting of a gear assembled on a hub be ordered to ensure undamaged surfaces on the output hub where the output seals rub. However, if it is desired to use the old output hub, press the gear and bearing off and examine the rubbing surface under the oil seal carefully for possible scratching or other damage resulting from the pressing operation. To prevent oil leakage at the shaft oil seals, the smooth surface of the output hub must not be damaged.

If any parts must be pressed from a shaft or 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. Do not press against rollers or cages of any bearing.

Because old shaft oil seals may be damaged in disassembly, it is advisable to order replacements for these parts.

REMOVING REDUCER FROM SHAFT

Removal of Tapered Bushings and Reducer

1. Disconnect and remove the torque-arm rod from the reducer adapter.
2. Remove busing screws from bushings.
3. 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 ushing flanges are clean. A tap can be used to clean out the threads. Use caution to use the proper size tap to prevent damage to the threads.
4. Remove the outside bushing, the reducer, and then the inboard bushing.

Disassembly

1. Drain all oil from the reducer.
2. Position the reducer on its side and remove the motor assembly, front cover, and all housing bolts. Drive dowel pins from the housing. Using the three pry slots around the periphery of the flange, gently separate the housing halves. Open housing evenly to prevent damage to the parts inside.
3. Lift the input shaft, all gear assemblies, and bearing assemblies from the housing. Remove all bolts retaining the bevel cartridge assembly and remove them from the housing.
4. Remove the input gear from the bevel pinion cartridge assembly.
5. Disassemble the bevel pinion cartridge.
6. Remove all seals from housing.
7. Remove all bearings from shafts, hubs, and bevel pinion. Be careful not to scratch or damage any assembly or seal area during bearing removal. The hub assembly can be disassembled for gear replacement, but if scratching or grooving occurs on the hub, seal leakage will occur, and the hub will need to be replaced.

Reassembly

1. **Output Hub Assembly:** Heat gear to 325 °F to 350 °F (162 °C to 176 °C) to shrink onto the hub. Heat bearings to 270 °F to 290 °F (132 °C to 143 °C) to shrink onto the hub. Any damage to the hub surfaces where the oil seals rub will cause leakage, making it necessary to use a new hub.
2. **Countershaft and Bevel Gear Assembly:** Countershaft and pinion are integral. Press bevel gear and bearings on the shaft. Press against the inner race (not cage or rollers) of bearings.
3. **Input Shaft Assembly:** Shaft and pinion are integral. Press bearings on the shaft. Press against the inner race (not cage or rollers) of bearings.
4. **Bevel Bearing Cartridge Assembly:** Install the bearing cups into cartridge housing making sure bearing cups are fully seated against the bearing shoulders.
   a. Heat bearing cone to 270 °F to 290 °F (132 °C to 143 °C) to shrink onto the bevel pinion shaft adjacent to the bevel pinion teeth. The bevel shaft and pinion are integral. If pressing is required, press against the inner race (not cage or rollers) of bearings.
   b. Slide the bevel pinion and bearing cone assembly into the bearing cartridge and set the cartridge assembly into a press with the pinion teeth facing down.
   c. Using press, install the outer bearing cone onto the bevel pinion shaft using pressure per Table 10. The pressure listed is required to set the correct preload. Do not press against the bevel pinion teeth as damage may occur. Press against a flat surface on the end of the pinion only. The bevel pinion assembly should now have a slight preload.
   d. Remove from press and install the snap ring. At this time, the bevel assembly should be tight with no bearing endplay.
   e. Measure the gap between the snap ring and the bearing.
   f. Remove the snap ring and add a shim equal to the measured gap minus 0.0015" (0.04 mm) and reinstall the snap ring.
   g. Using a rubber hammer, slightly tap the end of the pinion. The bearings will slightly loosen. Verify the bearing end play setting per Table 11.
5. Place reducer housing with bevel cartridge provision on blocks to allow for protruding end of output hub during reassembly.
6. Drive the two dowel pins into place in the housing.
7. Install bearing cup for bevel gear countershaft assembly into the housing bore and install bevel gear assembly. Install the bevel pinion cartridge assembly into the housing.
8. Lifting vertically upward on the bevel gear countershaft assembly, measure the movement of the countershaft assembly until the bevel gear is located tightly against the bevel pinion. Remove the bevel pinion cartridge from the housing and add a shim under the bevel gear countershaft assembly per Table 11. This is the backlash setting for the bevel pinion and gear.
9. Reinstall the bevel pinion cartridge assembly. Install first reduction gear and snap ring.
10. Install the bearing cup on the upper side of the bevel gear countershaft assembly and set the upper reducer housing in place. Measure and shim end play per Table 11.
11. Remove the upper reducer housing and lightly coat the bevel pinion with red lead or suitable coating to check contact pattern on the bevel gear.
12. Reinstall the upper reducer housing and rotate the input pinion 20-30 revolutions. This will transfer the red lead from the pinion to the gear teeth. Remove the upper reducer housing and check tooth contact. If contact pattern is not correct, shim the bevel pinion cartridge until an acceptable pattern is achieved. This process may need to be repeated several times until the correct pattern is obtained.
13. Install the input shaft assembly in the housing and set the input cover in place. Shim input assembly per Table 11.

14. Install the remaining bearing cups into the housing.
15. Install and mesh output hub gear and bevel gear countershaft assembly together and set in place in the housing. Make sure bearing rollers (cones) are properly seated in their cups. Set bearing cups for opposite side housing in place on their rollers.
16. Making sure both reducer housings are clean, set opposite side housing into position onto the dowel pins and tap with a soft hammer (rawhide, not lead hammer) until housing bolts can be used to draw housing together. Make sure reducer shafts do not bind while tightening housing bolts.
17. Rotate the input pinion shaft and seat all remaining bearings with a soft hammer. Using a magnetic base and indicator, measure and record the end play of the output hub assembly. Remove the upper housing and shim behind the bearing cup as required to achieve the correct bearing end play or preload per Table 10. Repeat this process and check the endplay until the proper endplay is obtained. Note that the output shaft is preloaded. After the endplay is determined, add the correct shim thickness to the end play reading to obtain the correct preload.
18. Remove the upper reducer housing. Clean the flange surfaces on both housings, making sure not to nick or scratch the flange face. Place a 1/8" (3 mm) bead of Dow RTV732 sealant or equivalent on the flange face (make sure RTV is placed around bolt holes and inside of the flange face). Place the opposite side housing into position onto the dowel pins and tap with a soft hammer (rawhide, not lead hammer) until housing bolts can be used to draw both housings together. Torque housing bolts per torque values are listed in Table 12.
19. Install input, output, and auxiliary seals. Extreme care should be used when installing seals to avoid damage due to contact with sharp edges on the output hub. The possibility of damage and consequent oil leakage can be decreased by covering all sharp edges with tape prior to seal installation. Lightly coat the seal lips with Mobilith AW2 All-Purpose grease or equivalent. Seals should be pressed or tapped with a soft hammer evenly into place in the reducer housing, applying pressure only on the outer edge of the seals. A slight oil leakage at the seals may be evident during initial running but should disappear unless the seals have been damaged.
20. Install bushing backup plates and snap rings on taper bushed reducers.

Table 11: Bearing Adjustment Tolerance & Backlash Setting

Reducer Size	Bearing Endplay Values in (mm)			
	Input	Countershaft	Output	Bevel
MTA7315H	0.001–0.003 (0.025–0.076) Loose	0.0005–0.002.5 (0.013–0.064) Loose	0.006–0.008 (0.152–0.203) Preload	0.0005–0.0015 (0.013–0.038) Loose
MTA8407H	0.001–0.003 (0.025–0.076) Loose	0.0005–0.002.5 (0.013–0.064) Loose	0.006–0.008 (0.152–0.203) Preload	0.0005–0.0015 (0.013–0.038) Loose
MTA9415H	0.001–0.003 (0.025–0.076) Loose	0.0005–0.002.5 (0.013–0.064) Loose	0.006–0.008 (0.152–0.203) Preload	0.0005–0.0015 (0.013–0.038) Loose
MTA10507H	0.001–0.003 (0.025–0.076) Loose	0.0005–0.002.5 (0.013–0.064) Loose	0.006–0.008 (0.152–0.203) Preload	0.0005–0.0015 (0.013–0.038) Loose
MTA12608H	0.001–0.003 (0.025–0.076) Loose	0.0005–0.002.5 (0.013–0.064) Loose	0.006–0.008 (0.152–0.203) Preload	0.0005–0.0015 (0.013–0.038) Loose

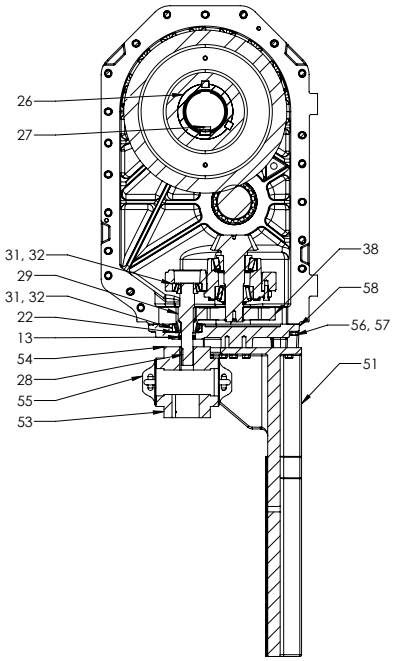
Table 12: Bearing Adjustment Tolerance & Backlash Setting

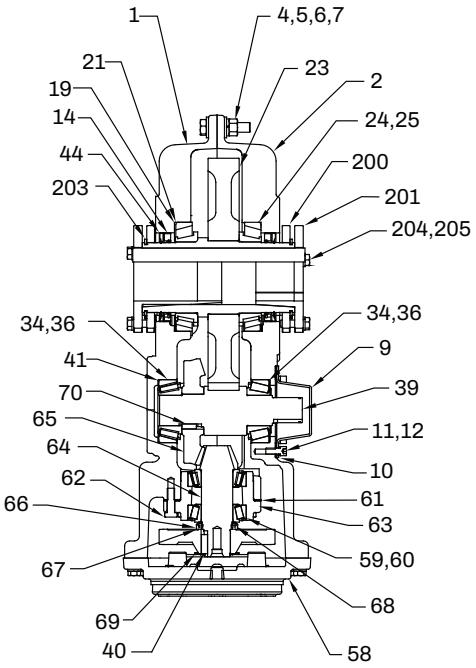
Housing Bolt Recommended Torque Values		
Reducer Size	Fastener Size	Torque ft-lbs (N-m)
MTA7315H	5/8-11	115-110 (156-149)
MTA8407H	5/8-11	115-110 (156-149)
MTA9415H	5/8-11	115-110 (156-149)
MTA10507H	3/4-10	205-200 (277-271)
MTA12608H	3/4-10	205-200 (277-271)

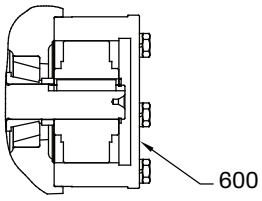
Parts for MTA7315H through MTA12806H Taper Bushed Reducers for Foot Mounted Motors

Ref	Description	Qty
1	Housing (LH)	1
2	Housing (RH)	1
①	RTV Sealant, Tube	1
4	Housing Bolt	13-20
5	Flat Washer	26-40
6	Nut	13-20
7	Lock Washer	13-20
8①	Dowel Pin	2
9	Backstop Shaft Cover	1
10	Backstop Cover Gasket	1
11	Backstop Cover Screw	6-12
12	Backstop Lock Washer	6-12
13	Input Oil Seal	1
14	Output Oil Seal	2
15①	Air Vent	1
16①	Bushing	1
17①	Oil Plug	-
17	Sensor Adapter	1
18①	Magnetic Oil Plug	1
19	Bearing Spacer	1
21	Output Bearing Shim (as required)	-
22	Input Bearing Shim (as required)	-
23	Output Gear	1
24	Output Bearing Cup	2
25	Output Bearing Cone	2
26	Output Hub	1
27	Output Gear Key	1
28	Input Pinion Key	1
29	Input Pinion ⑤	1
31	Input Bearing Cup	2
32	Input Bearing Cone	2
34	Counter-Shaft Bearing Cup (LH)	1
	Counter-Shaft Bearing Cup (RH)	1
36	Counter-Shaft Bearing Cone (LH)	1
	Counter-Shaft Bearing Cone (RH)	1
38	First Stage Gear ④	1
39	Counter-Shaft Pinion	1
40	First Stage Gear Key	1
41	Counter-Shaft Bearing Shim (as required)	-
44	Auxiliary Output Seal	2
56	Bolt, Cover - Hex Head	8–19
56	Bolt, Cover - Socket Head	0–6
57	Lock Washer, Cover	8–19
58	Cover	1
59	Bevel Pinion Bearing Cup (inner)	1
	Bevel Pinion Bearing Cup (outer)	1
	Bevel Pinion Bearing Assembly (inner)	1
60	Bevel Pinion Bearing Cone (inner)	1
	Bevel Pinion Bearing Cone (outer)	1
	Bevel Pinion Bearing Assembly (outer)	1
61	Bevel Cartridge Shim (as required)	-
62	Bevel Cartridge Bolt	5 or 6
62	Bevel Cartridge Washer	5 or 6
63	Bevel Cartridge	1
64	Pinion, Bevel ④	1
65	Gear, Bevel ④	1
66	Bevel Pinion Shim (as required)	-
67	Washer, Bevel Pinion	1
68	Retaining Ring	1
69	Retaining Ring	1
70	Bevel Gear Key	1
200	Back-Up Plate (included in bushing kit)	2

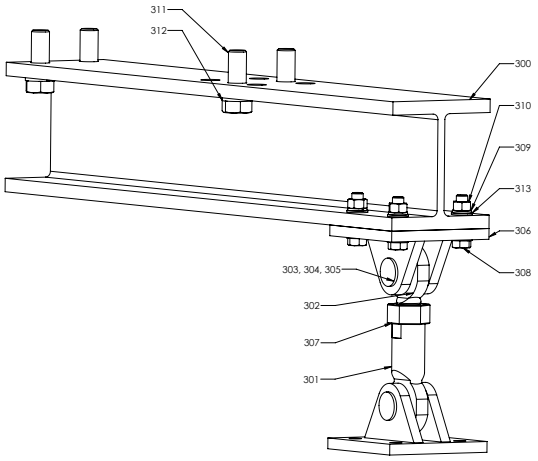
Ref	Description	Qty
201	Bushing Kit Assembly (standard shaft)	1
203	Retaining Ring (included in bushing kit)	2
204	Cap Screw (included in bushing kit)	6
205	Lock-Washer (included in bushing kit)	6
300	Tie Rod Support Beam	1
301	Female Tie Rod End	1
302	Male Tie Rod End	1
303	Rod End Pin	2
304	Snap Ring	2
305	Rod End Spacer	4
306	Tie Rod Anchor Bracket	-
307	Tie Rod Jam Nut	1
308	Bolt, Tie Rod Bracket (beam)	4
309	Lock Washer, Tie Rod Anchor Bracket	4
310	Hex Nut, Tie Rod Anchor Bracket	4
311	Bolt, Beam (reducer)	4
312	Lock Washer, Beam (reducer)	4
313	Flat Washer, Tie Rod Bracket	8
500	Foot-Mounted Motor Adapter	-
600	Backstop Assembly	1







OPTIONAL BACKSTOP ASSEMBLY



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

© DODGE INDUSTRIAL, INC.
AN RBC BEARINGS COMPANY

All Rights Reserved. Printed in USA.
MN1702 REV B 07/26