

Tigear®-2 Right Angle Quill C-Face, 3-Piece Coupled C-Face, & Separate Speed Reducers

Mounting, Operation, and Maintenance Instructions

Sizes 13-47

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 lbs) are noted on the shipping package. Proper lifting practices are required for these products.

APPLICATION INFORMATION

Thoroughly review the selection section of the Dodge® Tigear-2 catalog to ensure the reducer has been properly selected before putting the product into service.

The Tigear-2 reducer is designed to operate within the following temperature limits: Oil sump -10°F to +200°F with factory supplied standard lubricant.

The oil sump temperature can be approximated by taking measurements on the gear case upper or lower mounting pads on the end of the reducer opposite of the motor.

Where ambient temperatures exceed 100°F, care should be taken not to exceed 200°F sump temperature during unit operation. Contact Dodge Engineering for application assistance in extreme hot or cold ambient conditions. The use of non-ventilated motors will increase the reducer temperature. TEFC motors are recommended.

The continuous rated input horsepower (mechanical) shown on the reducer nameplate is for service factor of 1.0 at an input speed of 1750 RPM. Before placing the reducer into service, check the nameplate to confirm that its horsepower rating is consistent with the motor horsepower and the desired service factor. Service factor information can be found in your Dodge product catalogs.

3-piece coupled input reducers are required when using a clutch or clutch-brake between the reducer and motor.

3-piece coupled is also recommended when using single phase motors, or motors with brakes.

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.

INITIAL START-UP

WARNING: To ensure that driven equipment is not unexpectedly started, turn off, lock out and tag power source before working near the equipment. Failure to observe these precautions could result in bodily injury or property damage.

NOTE: Operating Tigear 2 reducers in altitudes above sea level will increase the reducer's internal pressure. Dodge recommends the reducer's internal pressure be equalized before operating in altitudes greater than 6100 feet (1860 meters) above sea level. To equalize the reducer's internal pressure, remove the oil fill plug located on the reducer's top face. Allow the pressure to equalize and re-install oil plug. Tighten oil plug to: 180 in-lb (15 ft-lb).

The Tigear-2 reducer will require a break-in period before reaching maximum operating efficiency and may run hot during the initial operation of the reducer. This is normal. It is also possible for a few drops of oil to be purged from the lip seals during the break-in period. The user can recognize this start-up seepage by its small volume and short duration. New reducers should be checked periodically during the first few days of use for any signs of severe overheating, continuous lubricant leakage or unusual noises.

CHECKLIST

1. Visually inspect the contents of the shipping container for any damage that may have been caused during shipping. Check contents for missing hardware and accessories.
2. Quill style input reducers are shipped from the factory as follows:
 - a. Input key installed in the Quill bore. **Do not remove this key and substitute any other key.**
 - b. Quill bore is pre-lubricated with special anti-seize compound—do not remove.
 - c. Four motor mounting bolts with lock washers in a plastic bag.
 - d. Output key is taped to the output (slow speed) shaft.
 - e. With hollow output reducers. The output key is supplied along with six set screws that have been pre-installed in the output (slow speed) hub.
 - f. Motor mounting flange gasket.
7. Separate style input reducers (keyed input shaft) are shipped from the factory as follows:
 - a. Input key taped to input shaft.
 - b. Output key taped to output (slow speed) shaft.

- c. With hollow output reducers. The output key is supplied along with six set screws that have been pre-installed in the output (slow speed) hub.
- 4. Motor Adapter Kits (Three-Piece Coupled)
 - a. Reducer coupling hub
 - b. Motor coupling hub
 - c. Elastomeric element
 - d. Motor adapter
 - e. Adapter mounting hardware
 - f. Four motor mounting bolts with lock washers in a plastic bag
 - g. "O" ring for adapter to reducer
 - h. Motor mounting flange gasket

MAINTENANCE

Tigear-2 reducers require no periodic maintenance. However, an occasional visual inspection to check for hardware tightness, leakage and the general overall condition of the reducer is good practice. Tigear-2 reducers are designed to operate successfully without breather vents. Since the reducer is shipped with lubricant, and breather plugs are not required, the user is able to eliminate the lengthy preparation normally required to place a reducer into service.

LUBRICATION - OIL FILL LEVELS

The Tigear-2 reducer is factory filled with a synthetic lubricant which eliminates costly preparation time normally required to put a reducer into service. The lubricant supplied is a high performance, H1 grade lubricant, suitable for all approved mounting positions. Do not add or remove any oil during installation or after the break-in period. When reducer selections are properly service factored to account for the thermal limitations of the reducer, the standard lubricant covers an operating ambient temperature range of -10°F to 130°F. No other lubricant available on the market provides the outstanding wear protection and thermal abilities of the factory-filled lubricant. Other lubricants, including Mobil SHC series lubricant, must not be mixed with the factory supplied lubricant. The use of another lubricant may compromise the performance of the reducer and void the warranty. Replacement lubricant is available through Renewal Parts, (864)297-4160. Standard temperature range replacement lubricant is available in quarts, part number 334863, and gallons, part number 334862. For operating ambient temperature range from -10°F to -30°F, replace the factory supplied lubricant with low temperature lubricant. Low temperature lubricant is available in quarts, part number 334861, and gallons, part number 334860.

Table 1—Lubrication Quantities

Configuration	Reducer Size									
	13	15	17	20	23	26	30	35	40	47
Quill Input Hollow Output Shaft	6 oz.	7 oz.	11 oz.	14 oz.	21 oz.	28 oz.	44 oz.	60 oz.	89 oz.	164 oz.
Quill Input Solid Shaft Output	6 oz.	7 oz.	12 oz.	15 oz.	23 oz.	32 oz.	48 oz.	66 oz.	97 oz.	176 oz.
Separate or 3-Piece Coupled Input Hollow Output Shaft	9 oz.	10 oz.	15 oz.	21 oz.	28 oz.	38 oz.	59 oz.	82 oz.	139 oz.	228 oz.
Separate or 3-Piece Coupled Input Solid Output Shaft	9 oz.	11 oz.	18 oz.	23 oz.	32 oz.	44 oz.	70 oz.	94 oz.	144 oz.	266 oz.

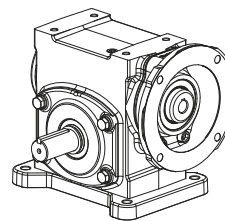
THE TIGEAR-2 SEALING SYSTEM

Tigear-2 reducers are kept completely sealed from the environment. No breather vents are required for any approved mounting position. The special design of the gear sets and the special synthetic lubricant enable the reducer to operate in a highly efficient manner. The internal temperature rise is minimized which, in turn, minimizes internal pressure build up. Tigear-2 oil seals employ special lip material and fit and are designed to ensure long, leak free operation when subjected to the small amounts of pressure that may develop within the speed reducer.

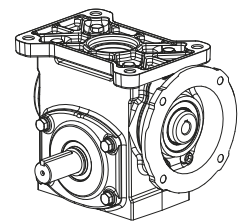
WARNING: The gearcase may be under pressure when the oil sump temperature is higher than the ambient temperature. Allow the reducer to cool down to room temperature before removing seals or bearing covers. Slightly loosen oil fill plug on top of gear case to vent any internal pressure. Failure to observe this precaution could result in personal injury or damage to the equipment.

MOUNTING POSITIONS

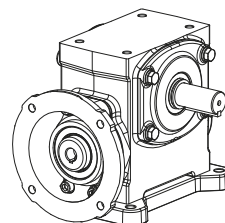
Tigear-2 reducers are supplied with a high performance lubricant factory filled to a level suitable for all approved mounting positions. Contact Dodge Application Engineering for positions not shown.



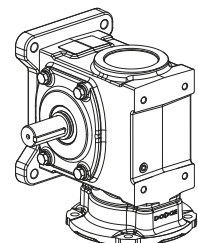
Floor Mounted, Motor Adapter or Input Shaft above Output Shaft



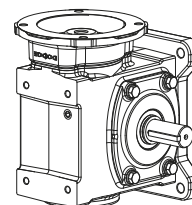
Ceiling Mounted, Motor Adapter or Input Shaft above Output Shaft



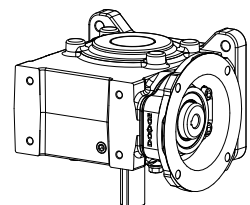
Floor or Ceiling Mounted, Motor Adapter or Input Shaft below Output Shaft
See Note 1



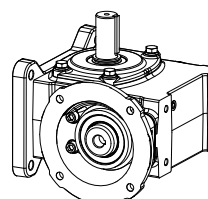
Wall Mounted, Motor Adapter or Input Shaft Facing Down
See Note 2



Wall Mounted, Motor Adapter or Input Shaft Facing Up
See Note 3



Wall Mounted, Output Shaft Facing Down
See Note 4



Wall Mounted, Output Shaft Facing Up
See Note 4

- Notes:
1. Not recommended due to flooded input seal.
 2. Not recommended due to flooded input seal. The configuration does not allow the upper bearing to get sufficient lubrication.
 3. For the 3-piece coupled and separate inputs, a sealed upper input bearing is required. Use Tigear-2 Mod Express designation "SB" for bearing modification.
 4. Not recommended for Quill input.

Figure 1 - Mounting Positions

MOTOR MOUNTING INSTRUCTIONS - QUILL STYLE REDUCERS

1. Check the reducer C-face mounting surface and tenon for nicks, burrs, and cleanliness.
2. Locate the supplied motor mounting bolts and lock washers shipped with the reducer.
3. Verify the factory applied anti-seize compound is in the quill bore. Do not remove the anti-seize compound from the bore.
4. Check that the factory installed quill input key is in place. The key may not be flush with the end of the input quill shaft.

WARNING: Do not replace the pre-installed key with any other key, or add an additional key. Failure to use the factory supplied key may result in motor shaft and quill bore damage along with the inability to transmit torque.

5. Check the motor shaft, motor shaft keyway, and motor C-face mounting surface for nicks, burrs, cleanliness and proper size.
6. Be sure to install the supplied gasket between the motor and reducer C-face mounting surfaces. To help prevent pinching the gasket, place and align the gasket onto the motor C-face for the 56 & 140TC frame motors and onto the reducer C-face for the 180, 210, & 250TC frame motors. A small amount of grease or other suitable product can be placed on the gasket in three locations to temporarily hold gasket into place.
7. Place the reducer on a secure surface with the reducer C-face mounting surface facing up. Align the quill input key with the motor shaft keyway and lower the motor into place making sure the motor tenon fully seats in the reducer motor adapter. If the motor cannot be installed vertically, the use of 2 threaded studs during the assembly will help locate and align the motor as it is being mounted onto the reducer. Thread the studs into any 2 tapped holes in the motor C-face that are 180 degrees apart as shown in Figure 2. Align the reducer key and motor keyway, and also align the threaded studs with the mounting holes in the reducer C-face. Slide the motor into place making sure the motor tenon fully seats in the reducer motor adapter.
8. Install and tighten the motor bolts. Torque motor bolts per Table 2 below.

Table 2—Motor Mounting Bolt Torque

Reducer Size	C-Face	Bolt or Capscrew Size	Torque in-lbs. (non-lubricated)
13 - 40	56C 140TC	3/8 -16	276 in-lbs. (23 ft-lb.)
23 - 47	180TC 210TC 250TC	1/2 - 13	684 in-lbs. (57 ft-lb.)

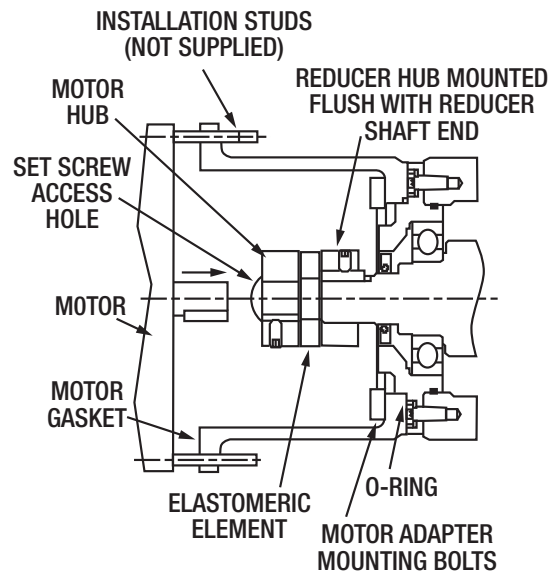


Figure 2 - Motor Mounting

MOTOR MOUNTING INSTRUCTIONS - SEPARATE STYLE REDUCER WITH 3-PIECE COUPLING MOTOR ADAPTER

This configuration of Tigear-2 uses a standard NEMA C-Face motor with a 3-piece flexible coupling. The 3-piece couplings are sourced from two manufacturers. Tigear-2 reducers may contain either manufacturer's coupling. Both manufacturers' 3-jaw coupling designs meet or exceed Dodge's torque and dimensional requirements.

ASSEMBLING THE COUPLING

1. Position the reducer vertically with the input shaft facing up.
2. Install reducer half of the coupling with key so that the main body of the hub is flush with the end of the reducer input shaft and tighten the set screw(s). Coupling hubs may contain one or two set screws. Rotate coupling hub one revolution to verify the number of set screws. Torque all set screws per Table 3.
3. Install the supplied "O" ring between the reducer and the motor adapter.
4. Install the Motor Adapter using the supplied hardware. Torque Motor Adapter bolts per Table 4.
5. Install the elastomeric center element of the coupling.
6. Place the motor half of the coupling onto the elastomeric element mounted on the reducer shaft.
7. Install the key into the motor shaft. Stake in place with a punch.
8. Install the gasket between the motor and motor adapter flange. To help prevent pinching the gasket, place and align the gasket onto the motor face for the 56 & 140TC frame motors and onto the motor adapter face for the 180, 210, & 250TC frame motors. A small amount of grease or other suitable product can be placed on the gasket in three locations to temporarily hold gasket into place.
9. Align the coupling keyway and motor key then slide the motor shaft into the coupling assembly until the motor stops against the flange.
10. Install and tighten the motor bolts. Torque motor bolts per Table 2.
11. Looking through the access hole verify that the coupling faces are in full contact with the coupling elastomeric element—without any preload.

12. Insert a .010" to .030" shim between the elastomeric element and motor half of the coupling and tighten the set screw(s) on the motor half of the coupling. Coupling hubs may contain one or two set screws. Rotate coupling one revolution to verify the number of set screws. Torque all set screws per Table 3.

NOTE: The factory supplied coupling set screws contain a thread locking patch. Additional thread locker is not required. The set screws should be replaced after 15 tightening/loosening cycles with new factory set screws containing the thread locking patch.

Inspect the motor/adaptor gasket each time the motor is removed and installed. If the gasket is damaged, replace the gasket.

Contact the Tigear-2 Custom Order Engineering group at +1 864 284 5700 with any questions.

**Table 3—Three-Piece Coupling Motor & Reducer
Coupling Set Screw Torque**

Reducer Size	C-Face	Coupling Size	Set Screw Size	Hex Key Size	Tightening Torque
13A - 30A	56C	L075	1/4-20 x 5/16	1/8	78-87 in-lbs (6.5 - 7.3 ft-lb)
13A - 15A	140TC				
35A	56C	L090	1/4-20 x 5/16	1/8	78-87 in-lbs (6.5 - 7.3 ft-lb)
17A - 35A	140TC				
40A - 47A	140TC	L099	5/16-18 x 3/8	5/32	150-165 in-lbs (12.5 - 13.8 ft-lb)
23A - 47A	180TC				
35A - 47A	210TC	L110	3/8-16 x 1/2	3/16	260-290 in-lbs (21.7 - 24.2 ft-lb)

Table 4—Motor Adapter Bolt Torque

Reducer Size	"Bolt or Capscrew Size"	Tightening Torque (non lubricated)
13 - 20	5/16 - 18	204 in-lb
		(17 ft-lb)
23 - 30	3/8 - 16	360 in-lb
		(30 ft-lb)
35 - 47	7/16 - 14	576 in-lb.
		(48 ft-lb)

STRAIGHT HOLLOW BORE INSTALL

1. Loosen the six set screws in the hollow bore shaft. Place the key on the drive shaft.
2. Apply anti-seize compound to the driven shaft and slide the reducer onto the driven shaft. If the key is shorter than the length through bore of the hollow shaft, locate the key on the side of the reducer closest to the equipment.
3. Hand tighten one of the set screws and then hand tighten a set screw in the same position on the opposite side of the reducer. This will take up the clearance between the shaft and reducer to the same side and reduce wobble. Continue the alternating hand tightening until all the set screws have been tightened.
4. After all the set screws have been hand tightened, use a torque wrench to tighten the set screws to the values shown in the Table 5. The 10-32 set screw over the key should be tightened to 3 ft-lb.

Table 5 - Set Screw Torque

Reducer Size	Set Screw Size	Tightening Torque (ft-lb)
17-26	1/4-28	8
30-47	5/16-24	15

LIMITED WARRANTY

The Tigear-2 Reducer is warrantied under the "Standard Terms and Conditions of Sale" against defects in material and workmanship. Warranty claims must be submitted to the company within one year from the date of installation or three years from the date of manufacture, whichever occurs first. The warranty is valid providing the product is properly applied, installed, operated and maintained in accordance with the instruction manual. This warranty covers product replacement or repair only and excludes labor, equipment and/or downtime for removal and installation. This warranty shall not apply where equipment is operated above rated load capacity or is subject to accident, alteration, misuse or abuse. This warranty described in the "Standard Terms and Conditions of Sale" is in lieu of and excludes all other expressed or implied warranties.

NOTE: Service and repair under warranty should be performed only by a Dodge authorized service shop. Contact Dodge Warranty Administration at +1 864 284 5777 for the nearest location and to register warranty claims.

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

