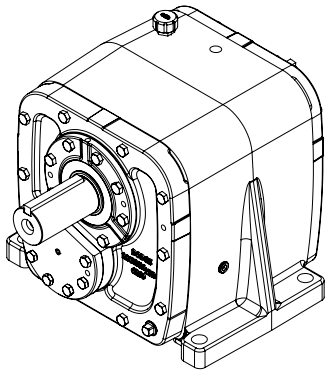
Maxum XTR® Reducers
Backstop Field Installation (Sizes 50—70)
Instruction Manual

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-out the power source before proceeding. Failure to observe these precautions could result in bodily injury.

WARNING: Do not use backstops for applications involving energy absorption and shock or torque loads in excess of reducer ratings nor on people moving applications such as chair lifts, amusement rides, etc., where the safety of person or property is dependent on backstop function. Failure to observe this precaution could result in bodily injury.



INTRODUCTION

Purpose of this manual

This manual provides instructions for the field installation of backstops on Maxum XTR reducer sizes 50—70. It is intended for experienced and highly qualified maintenance and assembly technicians who are responsible for installing, maintaining, or replacing backstops in industrial reducer applications. Incorrectly installing backstops may void the reducer warranty and cause damage to reducer and driven equipment.

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 ensure 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.

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

WARNING: If backstop is used to restrain a load, like an inclined conveyor, block the machinery so it will not move prior to proceeding with backstop installation or removal. Failure to observe this precaution could result in bodily injury.

If there are questions regarding installation, contact your local Dodge Field Sales Engineer or Dodge Application Engineering at engineering@support.dodgeindustrial.com.

The procedures outlined in this manual will help ensure proper installation, optimal performance, and extended service life of both the backstop and the reducer.

Applicable reducer models

This manual is intended for field installation of backstop kits of the following Maxum XTR reducer sizes and configurations:

- Size 50 - all configurations
- Size 60 - all configurations
- Size 70 - all configurations

Backstop general information

1. A backstop can be furnished on all Maxum XTR reducers. The backstop is used when applications require rotation prevention in one direction.
2. Maxum XTR Size 50—70 reducers use an internal/integral backstop configuration using the factory, standardly installed intermediate shaft.
3. If a Maxum XTR reducer shipped with a factory installed backstop, the model number will include a “-BS” in the nomenclature. For example, “DCR-50-20.93-BS”. Additionally, the part number of the unit will include either a “CW” or “CC”, indicating the “Clockwise” or “Counter-Clockwise” direction of rotation when looking at the end of the output shaft. For example, “268641CC” for a “DCR-50-20.93-BS” with a counter-clockwise output shaft rotation. In these cases, it is important to verify proper installation direction of the replacement backstop.
4. Do not use the backstop above its torque or speed ratings. Consult with Dodge for questions regarding backstop ratings.

Reducer size	Backstop ratings	
	Torque (lb-in)	Speed (rpm)
50	8,000	2,000
60	13,625	3,000
70	18,200	3,000

5. Do not attempt to disassemble the backstop. It is a precision mechanism made to high-quality control standards.

PARTS IDENTIFICATION

This section helps identify the parts that are included in the backstop kits. Please familiarize yourself with the parts and verify all parts are included in the kit before beginning disassembly and backstop installation.

Size 50 backstop kit parts

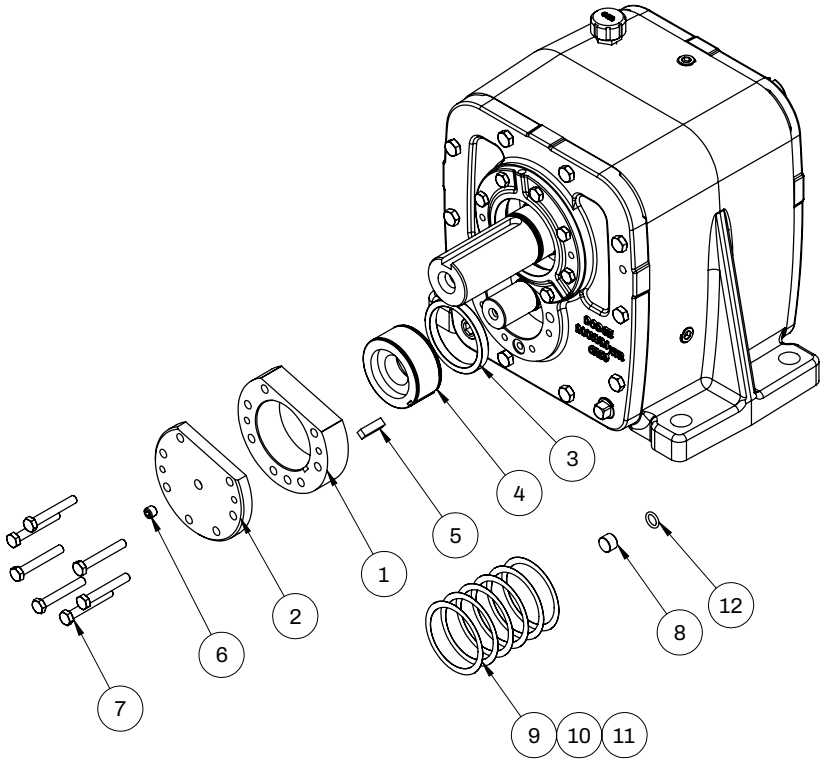


Figure 1 - Size 50 Parts Diagram

Table 2–Size 50 backstop kit

Item	Part number	Description	Quantity
1	270344	CR50 BACKSTOP CARRIER	1
2	270345	CR50 BACKSTOP COVER	1
3	270349	BACKSTOP SPACER	1
4	270343	BACKSTOP	1
5	270348	3/8 X 3/8 X 1-5/16 KEY	1
6	430029	1/4 in SOC HD PIPE PLUG COATED	1
7	036000070KG	M10-1.50 X 70 HHCS 10.9	7
8	304624	1/2 in X 3/4 in DOWEL PIN	1
9	270066	SHIM, 3.74OD X 3.12ID X 0.005 THICK	2
10	270067	SHIM, 3.74OD X 3.12ID X 0.007 THICK	2
11	270068	SHIM, 3.74OD X 3.12ID X 0.015 THICK	2
12	273620	O-RING, 2-113	1

Size 60 and 70 backstop kit parts

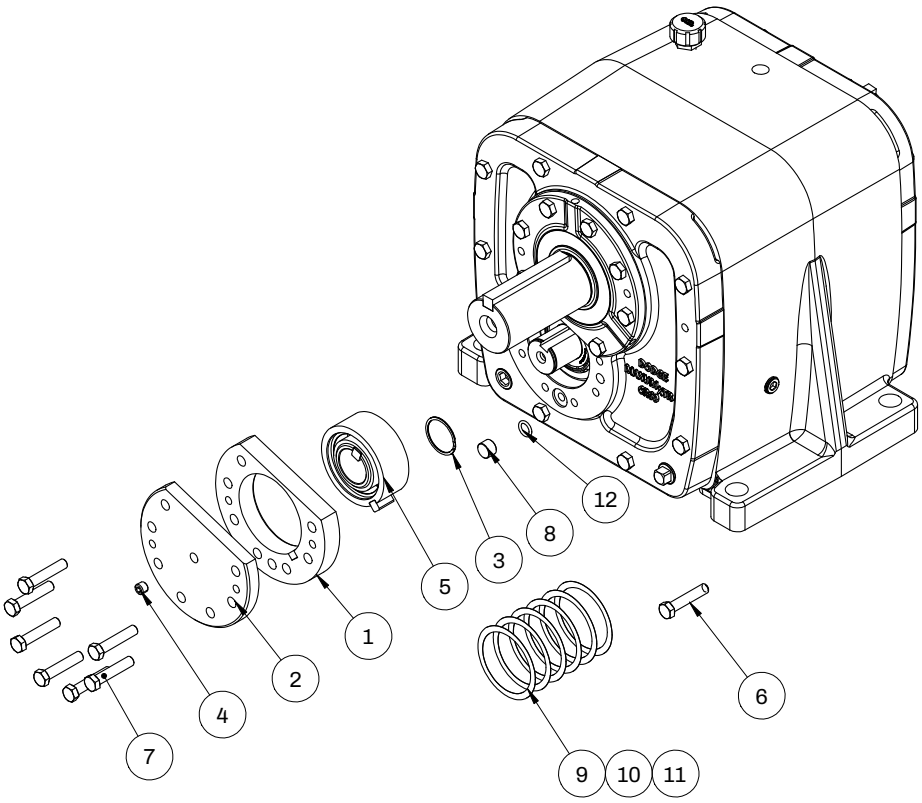


Figure 2 - Size 60 and 70 Parts Diagram

Table 3–Size 60 backstop kit

Item	Part number	Description	Quantity
1	270198	CR60 BACKSTOP CARRIER	1
2	270199	CR60 BACKSTOP COVER	1
3	270394	RETAINING RING	1
4	430029	1/4 in SOC HD PIPE PLUG COATED	1
5	2700393	BACKSTOP (INNER/OUTER RACE AND KEYS)	1
6	304530	M10 X 1.50 X 35 HHCS 8.8	1
7	03600060LG	M12-1.75 X 60 HHCS 10.9	7
8	451630	1/2 in X 1 in DOWEL PIN	1
9	270168	SHIM, 4.03OD X 3.41ID X 0.005 THICK	2
10	270169	SHIM, 4.03OD X 3.41ID X 0.007 THICK	2
11	270170	SHIM, 4.03OD X 3.41ID X 0.015 THICK	2
12	270183	O-RING, 2-209	1

Table 4–Size 70 backstop kit

Item	Part number	Description	Quantity
1	270098	CR70 BACKSTOP CARRIER	1
2	270099	CR70 BACKSTOP COVER	1
3	270096	RETAINING RING	1
4	430029	1/4 in SOC HD PIPE PLUG COATED	1
5	270095	BACKSTOP (INNER/OUTER RACE AND KEYS)	1
6	36000035KA	M10 X 1.50 X 35 HHCS 8.8	1
7	360000LG	M12-1.75 X 60 HHCS 10.9	7
8	304624	1/2 in X 1 in DOWEL PIN	1
9	270258	SHIM, 4.78OD X 4.03ID X 0.005 THICK	2
10	270259	SHIM, 4.78OD X 4.03ID X 0.007 THICK	2
11	270260	SHIM, 4.78OD X 4.03ID X 0.015 THICK	2
12	273261	O-RING, 2-207	1

DISASSEMBLY INSTRUCTIONS

Sizes 50, 60, and 70

1. Ensure reducer is in a safe state to work on by removing unit from service or that the equipment is properly de-energized and properly locked and tagged out. Note that the recommended position to work on the reducer is with the output shaft pointing up. Other orientations may require draining the reducer oil prior to removing the intermediate shaft cover.
2. Remove the intermediate shaft cover and O-rings by removing the seven hex head cover bolts. Cover has tapped jack holes that can be used to assist in removing the cover from the reducer housing. Cover, bolts, and O-rings will not be reused for backstop install. Save or discard as appropriate.
3. Remove the metal shims sitting on the bearing cup. Measure the thickness of the entire stack of shims, record the value, and set shims and measurement aside for future reference and use during the assembly process.
4. Clean the cover sealing surfaces by using isopropyl alcohol and a lint free cloth. Use compressed air to blow out any recesses or threaded holes. Inspect sealing surface to ensure it is free from scratches or damage before beginning backstop installation.

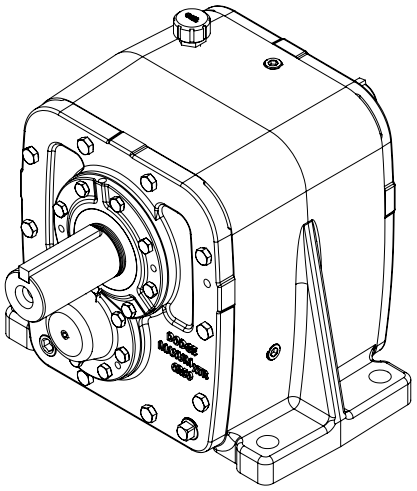


Figure 3 - Standard Maxum XTR Unit

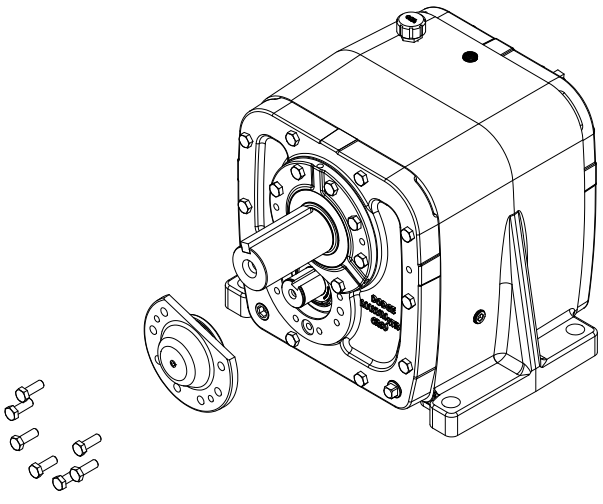


Figure 4 - Disassembly

INSTALLATION INSTRUCTIONS

Size 50

1. Ensure the reducer is in a safe state to begin installation. Note that the recommended position to work on the reducer is with the output shaft pointing up. Other orientations may require draining the reducer oil prior to removing the intermediate shaft cover.
2. Remove backstop (4) from packaging.
3. Install the backstop outer key (5) into the backstop carrier (1) and coat the bore with a thin film of oil.
4. Coat the backstop spacer (3) with a thin film of oil and insert into the reducer housing bore.
5. Identify orientation of backstop in the carrier to achieve desired overrunning rotation by turning the input shaft, verifying the output shaft is turning in the correct direction, then making note of which direction the intermediate shaft for the backstop turns. The backstop will need be installed to allow free rotation in this direction.
6. The backstop carrier (1) will be mounted with the dowel hole on the reducer side. Do not install dowel at this time. Install the backstop (4) into the carrier with the rotation arrow pointing in the desired direction of free rotation. Ensure that the parts are not tilted relative to each other. Lightly tap the backstop outer edge until it slides freely in the bore. Do not use excessive force.
7. Refer to the recorded measurement of the shim pack during disassembly. If measurement was not taken, make a measurement of the total thickness of the shim pack removed during disassembly. Subtract approximately 0.010 inches—0.015 inches from the measured total thickness of the original shims. Using the additionally provided shims (9, 10, 11), make a new shim pack with the calculated total shim value and re-install. Note, the thickest shim should be installed next to the bearing cup and thinner shims should be placed between the thicker shims.
8. Apply a thin coat of oil over the backstop sprags, inner race, and housing bore.
9. Gently slide the backstop (4) and carrier (1) onto the shaft stub and into the housing bore while rotating the shaft in the overrunning direction. Shaft can be rotated via input shaft. Do not use excessive force during assembly.
10. Perform bearing end-play pre-assembly checks by following steps 11 through 13.
11. Install the backstop cover (2) using 4x M10 x 1.50 cap screws (7). Tighten to 27 lb-ft torque.
12. Insert one M10 x 1.50 cap screw (7) through the backstop cover into the tapped hole in shaft. Snug cap screw to remove clearance in threads. Rotate and lightly tap cap screw to seat lower bearing.
13. Mount magnetic base dial indicator on housing with plunger on cap screw head parallel to shaft axis. Set indicator to zero. Pry under cap screw (6) head to measure bearing end-play. Bearings need to be adjusted to have 0.001 inches—0.003 inches end-play. Reference Figure 5.

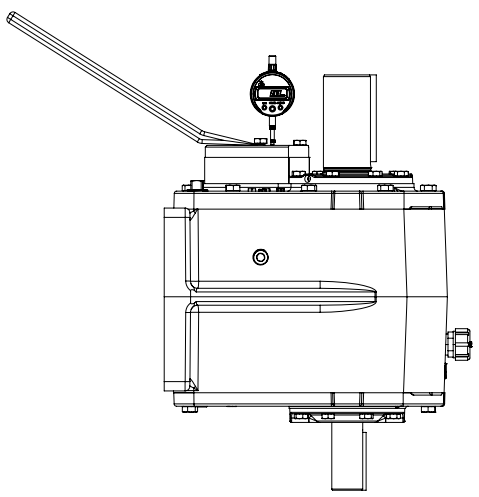


Figure 5 - End-play Check Setup

14. If bearing end-play requires adjustment, remove backstop assembly and add or remove shims to reduce end-play as necessary. Repeat measurement from step 13. Continue process until bearing end-play is correctly set.
15. For final assembly, remove backstop cover (2) and press dowel pin (8) into backstop carrier (1). Install O-ring (12) over Figure 6. Apply thin bead of Loctite 515 or equivalent at carrier-reducer joint and cover-carrier joint. Apply a bead of Loctite 515 or equivalent to fully circle the fastener holes. Install all M10 x 1.50 cap screw (7) fasteners with medium-strength thread locker and tighten to 27 lb-ft torque.
16. Record a final measurement of bearing end-play using the process from step 13.
17. Coat pipe plug (6) with a thread sealant and install in cover.

Size 60 and 70

1. Ensure the reducer is in a safe state to begin installation. Note, the recommended position to work on the reducer is with the output shaft pointing up. Other orientations may require draining the reducer oil prior to removing the backstop cover.
2. Remove backstop (5) from packaging. Verify all parts are included in the kit. Backstop (5) includes an inner key, inner race, outer sprag assembly, and outer key.
3. Install inner key into keyway on reducer backstop stub.
4. Coat backstop stub with a thin film of oil and assemble the inner backstop race onto the stub. Install retaining ring (3) for axial retention.
5. Install the backstop outer key into the backstop carrier (1) and coat the bore with a thin film of oil.
6. Identify orientation of backstop in the carrier to achieve desired overrunning rotation. The carrier will be mounted with the dowel hole on the reducer side. Do not install dowel at this time. Install the backstop (5) into the carrier with the rotation arrow pointing in the desired direction of free rotation. Ensure that the parts are not tilted relative to each other. Lightly tap the backstop outer edge until it slides freely in the bore. Do not use excessive force.
7. Refer to the recorded measurement of the shim pack during disassembly. If measurement was not taken, make a measurement of the total thickness of the shim pack removed during disassembly. Subtract approximately 0.010 inches—0.015 inches from the measured total thickness of the original shims. Using the additionally provided shims (9,10, 11), make a new shim pack with the calculated total shim value and re-install. Note, the thickest shim should be installed next to the bearing cup and thinner shims should be placed between the thicker shims.
8. Apply a thin coat of oil to backstop sprags, inner race, and housing bore.
9. Gently slide the backstop (5) and carrier (1) onto the inner race and into the housing bore while rotating the shaft in the overrunning direction. Shaft can be rotated via input shaft. Do not use excessive force during assembly.
10. Perform bearing end-play pre-assembly checks by following steps 11 through 14.
11. Install the backstop cover (2) and four M12 x 1.75 cap screws (7). Tighten to 47 lb-ft torque.
12. Insert M10x1.5 cap screw (6) through cover and engage in tapped hole in shaft. Tighten cap screw (6) until there is just enough clearance on the bolt hex head to fit a pry bar underneath. Rotate the input shaft and lightly tap cap screw (6) to seat lower bearing before taking measurements.
13. Mount magnetic base dial indicator on housing with plunger on cap screw (6) head parallel to shaft axis. Set indicator to zero. Pry under cap screw (6) head to measure bearing end-play. Bearings need to be adjusted to have 0.001 inches—0.003 inches end-play. Refer to Figure 5.
14. If bearing end-play requires adjustment, remove backstop assembly and add or remove shims to reduce end-play as necessary. Repeat measurement from step 13. Continue process until bearing end-play is correctly set.
15. For final assembly, remove backstop cover (2) and press dowel pin (8) into backstop carrier (1). Install O-ring (12) over oil feed passage. Install all fasteners with medium strength thread locker and tighten to 47 lb-ft torque.
16. Record final measurement of bearing end-play using the process from step 13.
17. Coat pipe plug (4) with a thread sealant and install in cover.

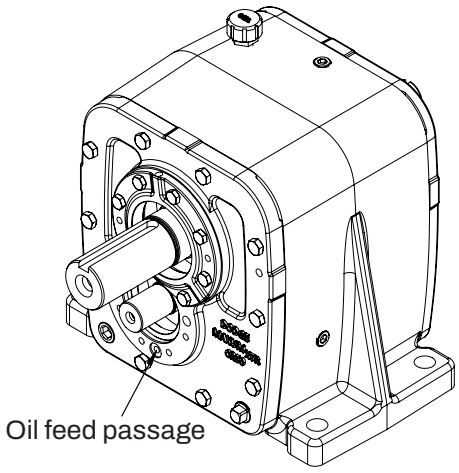


Figure 6 - Oil Feed Passage

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