Maxum® Reducers 7 through 12
Backstop Instruction Manual

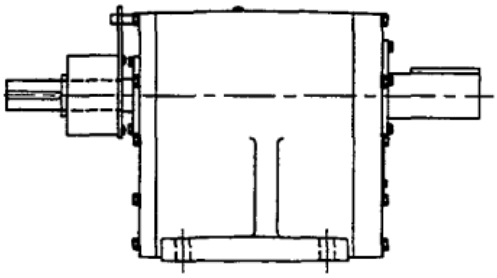
These instructions must be read thoroughly before installation or operation. This instruction manual was accurate at the time of printing. Please see **dodgeindustrial.com** for updated instruction manuals.

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

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 removal. Failure to observe this precaution could result in bodily injury.



Maxum Reducers 7-12 External Backstop

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.

BACKSTOPS – ASSEMBLY INSTRUCTIONS

A backstop can be furnished on all Maxum reducers. The backstop is used when applications require one direction of rotation or holding.

An external backstop is used on all sizes of Maxum reducers. On sizes 7 through 12, a special diameter and length input shaft is required. For correct lengths and diameters, consult the factory before installing.

Note that backstops are not compatible with all accessory items. Backstops cannot be used in conjunction with fans on reducer size 7 and backstops cannot be used in conjunction with top motor mounts on reducer sizes 7 through 12.

Backstops installed on reducers shipped from the factory should be checked for the proper direction of rotation before start up. Turn the input shaft by hand to determine if the direction of rotation is correct. If rotation is incorrect, the backstop must be reversed. For installation or reversal of backstops, locate the correct instructions for your size reducer in the following data.

GENERAL INFORMATION

1. Do not use the backstop above its torque or speed ratings.
2. DO NOT ATTEMPT TO TAKE THE BACKSTOP APART. It is a precision mechanism made by experienced workers under high quality control standards.

INSTALLATION INSTRUCTIONS FOR BACKSTOP SIZES 7 TO 12

Refer to the backstop parts guide Figure 1 and Table 1 for parts identification.

1. It is important that the backstop fit the shaft properly. The external backstops (1) should be mounted on the high speed shaft (23) of Maxum reducers with a clearance fit of 0.001 to 0.003 inches.

   CAUTION: On applications where a press fit is

necessary, consult the factory. Failure to observe this precaution could result in damage to or destruction of the equipment.

2. To minimize critical stresses in the keyway area of the inner race, the backstop keyways have a radius in the corners. A hardened key (4) designed to match the keyway is furnished with each stock backstop. Use this key in mounting the backstop to the shaft. The key must be 40 Rockwell C minimum hardness and must be completely contained under the backstop inner race. A tight fit on the key width is necessary on indexing apllications.
3. Orient the backstop (1) as though in operating position and check for proper rotation.
4. On those backstops designed as shown in Figure 1B, attach the torque-arm angle (12) to the torque-arm (11) using bolts (13), washers (14) (15) and nuts (16). Tighten to 59-67 ft-lbs torque.
5. Attach the torque arm (11) to the backstop (1) using the screws (7) and lock washers (8). Torque to the values that follow.

Screw Size	Torque Value
5/16-24 UNRF	220 in-lbs
3/8-24 UNRF	400 in-lbs
1/2-20 UNRF	1000 in-lbs

CAUTION: NEVER USE THE BACKSTOP AS A COUPLING. When the connection of two shafts is required in conjunction with a backstop, use a ocupling. Failure to observe this precaution could result in damage to, or destruction of, this equipment.

6. Remove the two input cover bolts and lock washers (12) from the reducer which align with the clearance holes in the backstop torque arm (11) or torque-arm angle (12). Save the lock washers.
7. Insert the two studs (10) into the reducer cover bolt holes as far as they will go and thread on the nuts (9) and lock washers (12). Tighten the nuts to the torque specified in Table 11.
8. Place the backstop key (4) into the input shaft (23) keyway.
9. Line up the keyways between the backstop and the reducer housing by rotating the input shaft in the opposite direction of its driving direction. If the backstop is properly oriented, the entire backstop will rotate with the input shaft in this opposite direction.
10. Slide the backstop onto the input shaft and over the backstop key until the backstop inner race is against the shoulder on the shaft. The studs (10) must completely penetrate the two holes in the backstop torque arm and the torque arm must not bind up on the studs.
11. When mounting the backstop on the shaft, apply pressure to the end face of the inner race only, as bearing damage could result from pressure being applied to the outer race. Care should also be exercised when installing the backstop to prevent damage to the seals.
12. Secure the backstop in position by sliding the retaining collar (5) onto the shaft and up against the backstop inner race. Tighten each of the three setscrews (6) in the retaining collar to 87 in-lbs.
13. Overrun (freewheel) the backstop by hand before subjecting it to test operation. Check to make sure the torque arm is not binding on the studs (10).
14. Fill the backstop with Exxon Beacon 325.

BACKSTOP LUBRICATION FOR MAXUM REDUCERS SIZES 7 THROUGH 12

1. Proper lubrication is critical to the extended service life of the external backstop.
   CAUTION: Lubricant classes EP (extreme pressure) MUST NOT be used in backstops. Failure to observe this precaution could result in damage to or destruction of the equipment.
2. The grease lubricated backstops are packed at the factory with Exxon Beacon 325.
3. For standard backstops with labyrinth seals, pump grease into the backstop until it flows freely from the seals. Use Exxon Beacon 325 grease.
4. Lubricate the backstop every three months. If the backstop is operating under severe abrasive dust conditions or twenty-four hours daily, lubricate monthly. Use Exxon Beacon 325.

Figure 1 - Parts Identification Backstops

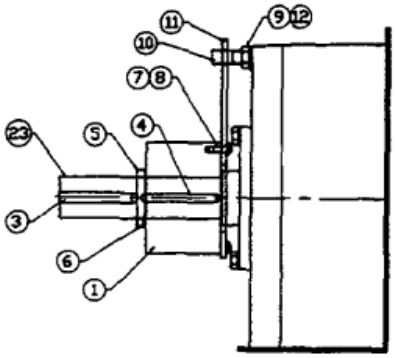


Figure 1A

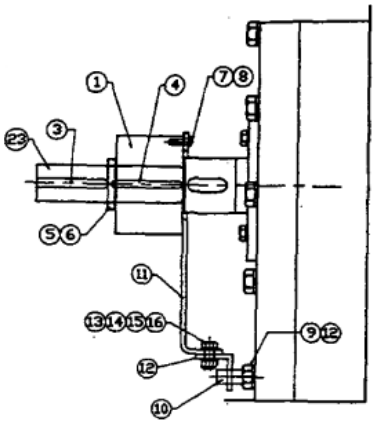


Figure 1B

Table 1 - Renewal Parts List, Backstop Reducers, Input Shafts and Input Pinions (23)						
Applicable Ratios	**Maxum Reducer Size**					
	7	**8**	**9**	**10**	**11**	**12**
5.063	301476	301777	302078	302380	302684	–
6.200 TO 9.300	301476	301777	302078	302380	302684	302982
11.39	301481	301777	302078	302380	302684	302982
13.95	301480	301778	302079	302381	302685	302983
17.09	301479	301779	302080	302382	302686	302984
20.93	301478	301780	302081	302383	302687	302985
25.63	301477	301781	302082	302384	302688	302986
31.39 TO 70.62	301506	301782	302107	302411	302691	302987
86.50 TO 129.7	301505	301784	302084	302387	302690	302989
158.9 TO 194.6	301483	301808	302109	302413	302716	302989

Part numbers above the line are input shafts and require an input shell pinion key.

Table 1 - Renewal Parts List - Backstops						
Ref No.	**Description**	**Maxum Reducer Size and Applicable Ratios**				
		7 5.063 TO 25.63	**7 31.39 TO 194.6**	**8 5.063 TO 11.39**	**8 13.95 TO 25.63**	**8 31.39 TO 194.6**
1	Backstop	299342	299341	299343	299342	299341
4	Backstop Key	299301	299303	299305	299301	299303
5	Retaining Collar	299337	299336	299338	299337	299336
6	Collar Setscrew	299340	299340	299340	299340	299340
7	Torque Arm Screw	299333	299333	299334	299333	299333
8	Lock Washer	419010	419010	419011	419010	419010
9	Stud Nut	304589	304589	304589	304589	304589
10	Stud Bolt	299329	299329	299330	299330	299330
11	Torque Arm	299308	299309	299310	299311	299312
12	Torque Arm Angle	N/A	N/A	299345	299345	N/A
13	Bolt	N/A	N/A	304539	304539	N/A
14	Lock Washer	N/A	N/A	304604	304604	N/A
15	Flat Washer	N/A	N/A	304643	304643	N/A
16	Nut	N/A	N/A	304588	304588	N/A

Table 1 - Renewal Parts List - Backstops							
Ref No.	Description	Maxum Reducer Size and Applicable Ratios					
		9 5.063 TO 11.39	9 13.95 TO 25.63	9 31.39 TO 194.6	10 5.063 TO 11.39	10 13.95 TO 70.62	10 86.50.95 TO 194.6
1	Backstop	299343	299342	299342	299343	299342	299342
4	Backstop Key	299305	299301	299301	299305	299301	299301
5	Retaining Collar	299338	299337	299337	299338	299337	299337
6	Collar Setscrew	299340	299340	299340	299340	299340	299340
7	Torque Arm Screw	299334	299333	299333	299334	299333	299333
8	Lock Washer	419011	419010	419010	419011	419010	419010
9	Stud Nut	304589	304589	304589	304590	304590	304590
10	Stud Bolt	299330	299330	299330	299331	299331	299331
11	Torque Arm	299313	299370	299314	299316	299371	299317
12	Torque Arm Angle	299346	299346	N/A	299347	299347	N/A
13	Bolt	304539	304539	N/A	304539	304539	N/A
14	Lock Washer	304604	304604	N/A	304604	304604	N/A
15	Flat Washer	304643	304643	N/A	304643	304643	N/A
16	Nut	304588	304588	N/A	304588	304588	N/A

Table 1 - Renewal Parts List - Backstops					
Ref No.	Description	Maxum Reducer Size and Applicable Ratios			
		12 6.200 TO 11.39	12 13.95 TO 25.63	12 31.39 TO 70.62	12 86.50 TO 194.6
1	Backstop	299344	299343	299342	299342
4	Backstop Key	299307	299305	299301	299301
5	Retaining Collar	299339	299338	299337	299337
6	Collar Setscrew	299340	299340	299340	299340
7	Torque Arm Screw	299335	299334	299333	299333
8	Lock Washer	419013	419011	419010	419010
9	Stud Nut	304591	304591	304591	304591
10	Stud Bolt	299332	299332	299332	299332
11	Torque Arm	299322	299323	299373	299324
12	Torque Arm Angle	299349	299349	299349	N/A
13	Bolt	304539	304539	304539	N/A
14	Lock Washer	304604	304604	304604	N/A
15	Flat Washer	304643	304643	304643	N/A
16	Nut	304588	304588	304588	N/A

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