

Rim-Loc Blast Wheel Maintenance & Assembly Manual



Parts and Machinery for the Abrasive Blast Industry

27301 E. 121st Street * Coweta, Oklahoma 74429 PH: (918) 486-8411 * FX: (918) 486-8412 * TF: (877) 659-8040 Email: coyotesales@tulsacoxmail.com Website: www.coyoteshotblast.com



INTRODUCTION

These instructions are intended for maintenance personnel for the maintenance and/or repair of the indicated blast wheel assembly. Disassembly and reassembly requires expertise and must be performed by personnel that are knowledgeable about the assembly. Please contact Coyote should you have any questions.

GENERAL DESCRIPTION

The Blast Wheel Assembly is the most vital part of any airless blast cleaning system, thus the operating efficiency depends entirely upon the proper inspection, assembly, and adjustment of the Blast Wheel components. Due to the abrasive nature of the material handled by the Blast Wheel there will be constant wear on internal parts making periodic inspection and replacement essential.

It is important to keep in mind that the very nature of this device requires that some of the parts be exceptionally hard and wear resistant. This hardness cannot be attained without making the wear parts brittle. When handling these parts (blades, impeller, control cage and liners) they should be considered as cast glass. A sharp blow with a drift or pry bar can result in chips flying off with explosive force. Flying chips may also result from accidentally or carelessly knocking hardened parts together. When working with Blast Wheel components, always wear gloves and safety glasses.

The efficiency of this equipment, the blast cycle time and the production requirements will all depend largely on the conditions under which the Blast Wheel is operated and maintained. Compliance with the instructions and suggestions given in this manual should result in a highly efficient and productive blast cleaning system. In brief, the Blast Wheel assembly functions as follows: The abrasive valve feeds a controlled amount of abrasive (steel shot or steel grit) through the feed spout to the impeller. The impeller, revolving at a high speed, moves the abrasive through the control cage opening into the path of the revolving blades. The blades, by means of centrifugal force, throw a controlled pattern of abrasive at the work surface. The Blast Wheel by throwing millions of particles of abrasive per minute at a tremendous velocity provides an economical and thorough method of cleaning.



INSPECTION OF THE WEARING PARTS

- 1. Open the manually operated disconnect at the control panel and tag switch so that the machine cannot be energized.
- 2. Remove blast housing cover by loosening nuts on each end of the cover, rotate clevis brackets and lift lid upward.
- 3. Remove the top liners to give access to the Blast Wheel assembly.
- 4. Rotate blades by hand and inspect them for wear. Vibration of the Blast Wheel when operating is usually an indication of excessive blade wear or a broken blade. Whenever vibration is excessive, all blades and springs should be removed and replaced. When blades are deeply grooved or worn to half their original thickness they should be replaced. Never attempt to replace anything less than a full set of blades and springs. The blades are carefully weighed and balanced in matched sets and should never be separated.
- 5. Make a visual inspection of the control cage opening. The sides of the opening are straight and when a groove or notch develops, the control cage should be replaced.
- 6. While rotating the blades by hand it is possible to see the leading edge of the impeller fingers. If fingers are grooved or worn to half their original size the impeller should be replaced.
- 7. The feed spout wears very slowly so the inspection of this part usually involves checking for cracks or other physical damage.
- 8. Blast Wheel liners should be replaced when they become worn to half their original thickness. If liners are allowed to wear through, serious damage could occur to the blast wheel housing.

Note: The wearing parts of the Blast Wheel should be inspected every 10-20 blast hours. This inspection can be done without any disassembly with the aid of a flashlight. Shine the flashlight up through the bottom of the Blast Wheel assembly and visually inspect the blades, rim, impeller and control cage. The liners can be inspected visually or by feeling the surface of the various liners.



BLAST WHEEL HOUSING LINERS

The Blast Housing Liners are identified as follows:

- **Top Liner** Part Number: C5001936 (1 PC) or C5001936-001L or 002R (2 Pc)
- End Liner Part Number: C5001937 (Short) or C5002308 (Long)
- ➤ Side Liner Part Number: C5001938 (Rear Side) or C5001939 (Front Side)

The blast housing liners are identified as follows: top liners, end liners and sideliners. These liners are made of an extremely hard cast alloy. The Blast Wheel liners are positioned around the Blast Wheel to protect the Blast Wheel housing. Since these liners are in the path of abrasive, wear is to be expected. Thus liners should be inspected often to determine when replacement is necessary. All liners should be inspected on a regular basis. If liners are allowed to wear through, the housing itself will quickly develop wear holes causing abrasive leakage on and around the machine. <u>ALWAYS OPEN ELECTRICAL</u> DISCONNECT PRIOR TO LINER INSPECTION.

The top liner is located in the uppermost section of the housing and is held in place by the housing cover. The sideliners are located in the front and backsides of the housing. The end liners are located in the right and left ends of the Blast Wheel housing. End liners are a slip fit between the sideliners.

CHECKING THE ROTATING ASSEMBLY FOR BALANCE AND NOISE

The Blast Wheel assembly should always run smooth with very little vibration or noise. Excessive vibration of the Blast Wheel or unusual noise during operation should be investigated immediately. Vibration is an indication of an "out of balance" wheel. An "out of balance" Blast Wheel is caused by worn or broken blades, impeller, rim or damaged internal parts. When investigating an "out of balance" wheel, blades should be inspected first followed by impeller, and rim.

Damage to the internal rotating parts of the Blast Wheel usually occurs when blades become worn through or broken and abrasive enters the area behind the blade. To inspect and replace the blades and other parts of the rotating assembly it will be necessary to partially or completely disassemble the Blast Wheel depending on the cause and remedy of the vibration or noise.

Motor failure or improper motor rotation could also cause excessive vibration or noise. A qualified electrical serviceman should do any motor repairs or replacements.

BLAST WHEEL DISASSEMBLY

- 1. Check to make sure the disconnect switch is open and tagged or locked open.
- 2. Remove blast-housing cover by loosening the nuts on each end of the cover, rotate clevis brackets and lift lid upward.
- 3. Lift top liner out.
- 4. Remove the feed spout by removing the two 3/8" hex head nuts holding it in place.
- 5. If blades are not badly worn they can be used again. To remove blades, push blade toward center of wheel and rotate bottom of blade out until it is free from the rim, then lift out. Remove all blades in this manner.
- 6. Unscrew and remove the socket head cap screw inside the impeller. To remove the impeller tap lightly on alternate sides of the outside end with a soft drift or plastic mallet. Repeated light tapping will usually loosen the impeller so that it may be removed from the front of the assembly.
- 7. Remove the two 3/8-16 x 1" hex head cap screws from the recessed slotted holes in the cage adapter, and remove control cage and centering plate.
- 8. Inspect all parts which have been removed to determine whether they are worn or damaged to the extent that replacement is necessary.
- 9. The Rim consists of Medallions and Filler Blocks. It is necessary to inspect these parts. The Medallions are held on the Rim by a Torx flush head bolt and the Medallions hold the Filler Blocks in place. When inspecting these parts look for unusual wear around the Centering Plate and the face of the Medallion where the blade locks into the Medallion. It may be necessary to replace the Medallions and Filler Blocks if there is excessive wear in these areas. Use a T40 Torx wrench to remove the Torx bolts, Medallions and Filler Blocks. These parts will easily come out. Reverse the process to replace them making sure you tighten the Torx bolts to 80 Ft. Lbs.
- 10. Replace top liner and housing cover. Bolt cover in place and run Blast Wheel rim (no abrasive).

Note: If the rim runs smoothly and there is no noticeable noise or excessive vibration, no further disassembly will be necessary. The worn parts can be replaced and the Blast Wheel re-assembled. However if vibration or noise is still present it will be necessary to complete the disassembly and remove the rim.



However if vibration or noise is still present it will be necessary to complete the disassembly and remove the Hub and follow these steps:

- 1. Remove housing cover and lift out top liner.
- 2. Loosen the compression cap screws on the right and left side of the blast housing. The end liners can now be removed through the top or bottom of the blast housing. Tap liner gently with a rubber or plastic mallet to ease removal.
- 3. Remove the four hex head cap screws holding the hub seal in place. The hub seal is in two pieces and contains a felt hub seal and a UHMW inner seal.
- 4. Remove the two allen head screws in the taperlock bushing. When the rim is loose on the bushing, slide the taperlock assembly forward into the blast housing and off the end of the motor shaft.

NOTE: See Attached Dodge Instructions as a reference for removal of Taper-Lock Bushing.

- 5. Remove the rim and key from the motor shaft.
- 6. Clean the motor shaft and all Blast Wheel components. Inspect the keyway in the motor shaft and the key for wear.
- 7. Inspect front and back sideliners for wear. If liners are worn to one half their original thicknesses they should be replaced. Remove the retaining bolts holding the front sideliner and remove. Repeat this step on the backside liner. The sideliners must be removed through the bottom of the blast housing.
- 8. If the Blast Wheel motor runs smoothly the Blast Wheel can be re-assembled. All badly worn parts should be replaced to assure a smooth running final assembly. If vibration still exists, the motor may need to be repaired or replaced. Be sure all motor or electrical repairs or replacements are done by a qualified electrician or serviceman.

BLAST WHEEL ASSEMBLY

- 1. Place the rear sideliner in position, and bolt in place.
- 2. Place the cage retainer inside the housing centering it with the large center hole of the housing front.
- 3. Attach the cage adapter to the cage retainer using two 3/8-16 x 1-1/4" hex head bolts and lock washers on the outer bolt circle.
- 4. Install the two support studs into the cage retainer. Make sure the studs do not extend past the cage retainer into the Blast Wheel area.
- 5. Install 3/8" lock washer and nut over the stude and tighten.
- 6. Replace key in the keyway on the motor shaft. Key should fit snugly in the keyway.
- 7. Place the taperlock-bushing adapter into the rim.

NOTE: See Attached Dodge Instructions as a reference for removal of Taper-Lock Bushing.

- 8. Install the front sideliner making sure it is in perfect alignment with the rear sideliner. This alignment is essential for the top liner and end liners to seal correctly.
- 9. Install blades by matched sets only.
- 10. Place blade spring into hole on the outer rim and place blade spring detent over spring and push downward until lower notch on blade mates with lip on the inner diameter of the rim, proceed with above until all blades are installed.
- 11. Spin rim by hand and inspect to assure that all blades are securely in place.
- 12. Install the centering plate over the end of the motor shaft and slide into bore of the rim aligning with the roll pin that is located in the rim.
- 13. Place the control cage inside the cage adapter. The circle in the outside rim of the control cage should be facing 180 degrees away from the shot pattern. The control cage is held in place by two 3/8-16 x 1" hex head screws with flat and lock washers. The screws and washers should be installed in the two recessed slotted holes in the cage adapter at the 3:00 and 9:00 position.
- 14. Move the assembly up and down and side to side until the spacing between the impeller and the control cage is equal all around.
- 15. Rotate blades by hand to check for cage clearance.
- 16. Repositioning the cage adapter and cage retainer to obtain proper cage clearance may be necessary.
- 17. Tighten the two 3/8" screws to hold the assembly in place.
- 18. Install the impeller inside the control cage matching up the notches in the impeller with the lugs on the centering plate.
- 19. Install socket head cap screw, with lock washer and flat washer into the threaded motor shaft.



- 20. Block the Blast Wheel rotation with a wooden block and tighten the screw until the flat washer is flattened.
- 21. Rotate the Blast Wheel assembly by hand and check for noise or binding.
- 22. Install top liner and replace blast-housing cover.
- 23. The end liners have sides and ends that interlock. They are located in the right and left ends of the Blast Wheel housing. End liners are a slip fit between the sideliners. End liners can be installed from the top or bottom to the housing. The longer end liner should extend from the bottom of the housing, facing in the direction of the blade rotation. When end liners are in place tap lightly with a plastic mallet to insure proper fit against the top liner.
- 24. Tighten the compression cap screws to hold end liners in place.
- 25. Inspect the feed spout seal and replace if necessary.
- 26. Place 3/8" flat washers over the two studs and slide the slotted ears of the feed spout into place over the two support studs and fix in place using flat washers, lock washers and 3/8" hex head nuts.
- 27. Rotate the Blast Wheel assembly by hand and check for noise or binding. If any, correct before proceeding.
- Proper rotation of the Blast Wheel motor should always be checked during initial installation; after any change to electrical supply lines, electrical circuits or Blast Wheel motor. Whenever the Blast Wheel is started for the first time, be sure to jog (momentarily start and stop) the blast motor to insure that the direction or rotation is correct and that positioning of the blades, cage and impeller are correct. Following the jog test, run the wheel "no load" test (no abrasive) checking for noise or vibration. Unit should run quietly with little or no vibration.
- 29. Always check the blast pattern after installation of new rotating wear parts



ADJUSTING AND CHECKING THE BLAST PATTERN

The adjustment of the blast pattern is of the utmost importance. A poor adjustment will not only reduce cleaning efficiency but also increase maintenance and replacement costs. A blast pattern test should be made when the equipment is first put in operation; when any decrease in blast efficiency is noted; after replacement or major maintenance have taken place; or if a change is made in the size or type of abrasive material used.

The "hot spot" is that area of the work surface receiving the greatest portion of the abrasive blast. It is visible by the discoloration caused by frictional heat. The "hot spot" should be directed toward the area of work to be blasted to give the most effective cleaning pattern. If not properly directed abnormal wear of the equipment and parts could occur.

To check the location of the "hot spot" place a metal plate in the direct path of the blast pattern at the average work height position. Blast the plate for 30 seconds and then immediately feel to locate the hottest spot. The plate after blasting will be very hot and care should be used when feeling for the "hot spot".

The control cage, located at the center of the Blast Wheel, receives the abrasive from the impeller through the static opening. The control cage, through the location of its opening, controls the point of delivery of the abrasive to the Blast Wheel blades. If the circle notch on the control cage rim face is set in a 12 o'clock position then each blade will pick up abrasive at this point and deliver it in a downward thrust at a point below the Blast Wheel (approximately 6 o'clock). The point of delivery may vary with different types and sizes of abrasive.

To adjust the blast stream, "hot spot", the control cage must be rotated clockwise or counter-clockwise. The notch in the cage should always be facing approximately 180 degrees away from the blast pattern. Rotating the control cage in a clockwise direction will move the "hot spot" clockwise, moving the control cage in a counter-clockwise direction moves the "hot spot" counter clockwise. Initial adjustment should begin with the notch in the 12 o'clock position. Final adjustment will usually be less than 1" from this point.

The pattern must always be checked at initial set-up under the condition the equipment will be operating



ABRASIVE CONTROL VALVE

Correct adjustment of the Abrasive Control Valve is essential for maximum cleaning efficiency and maximum Blast Motor Life.

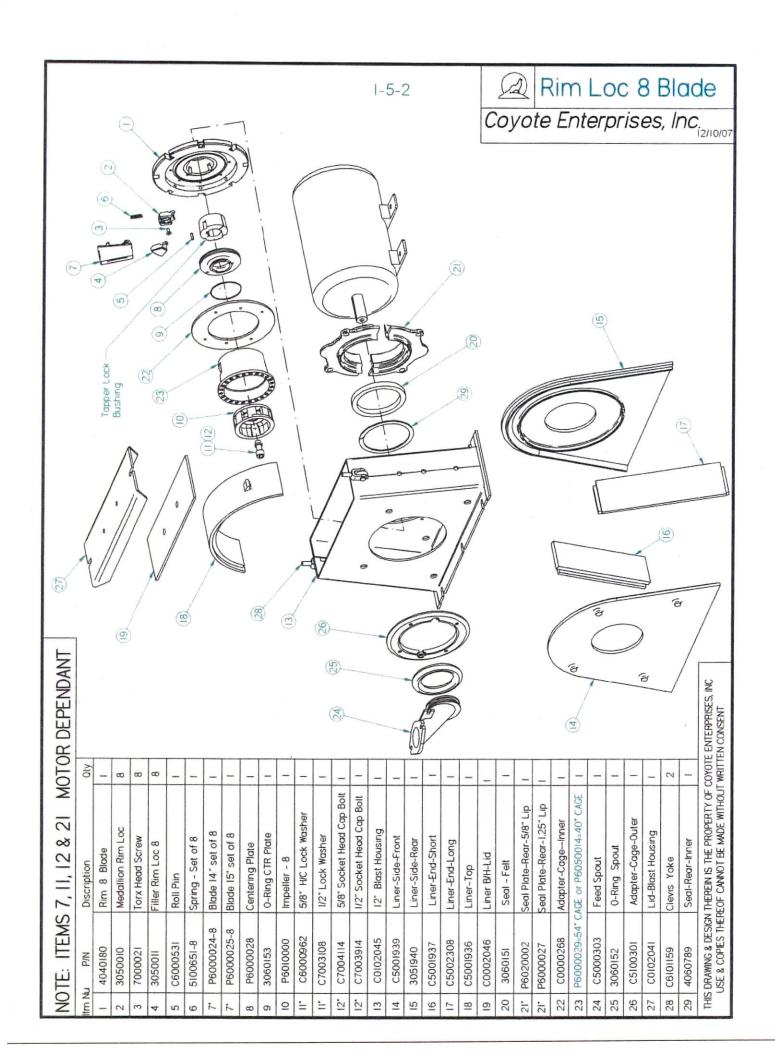
The Motor Load Amp Meter determines the abrasive flow adjustment. The Amp Meter registers the amperage load on the Blast Wheel Motor (see Motor Manufacturer's Nameplate for full load rating information). To obtain full Blast Wheel efficiency from an Amp Meter, the Amp Meter should always show a full load reading during the blast cycle. This reading can vary from one type of Abrasive to another.

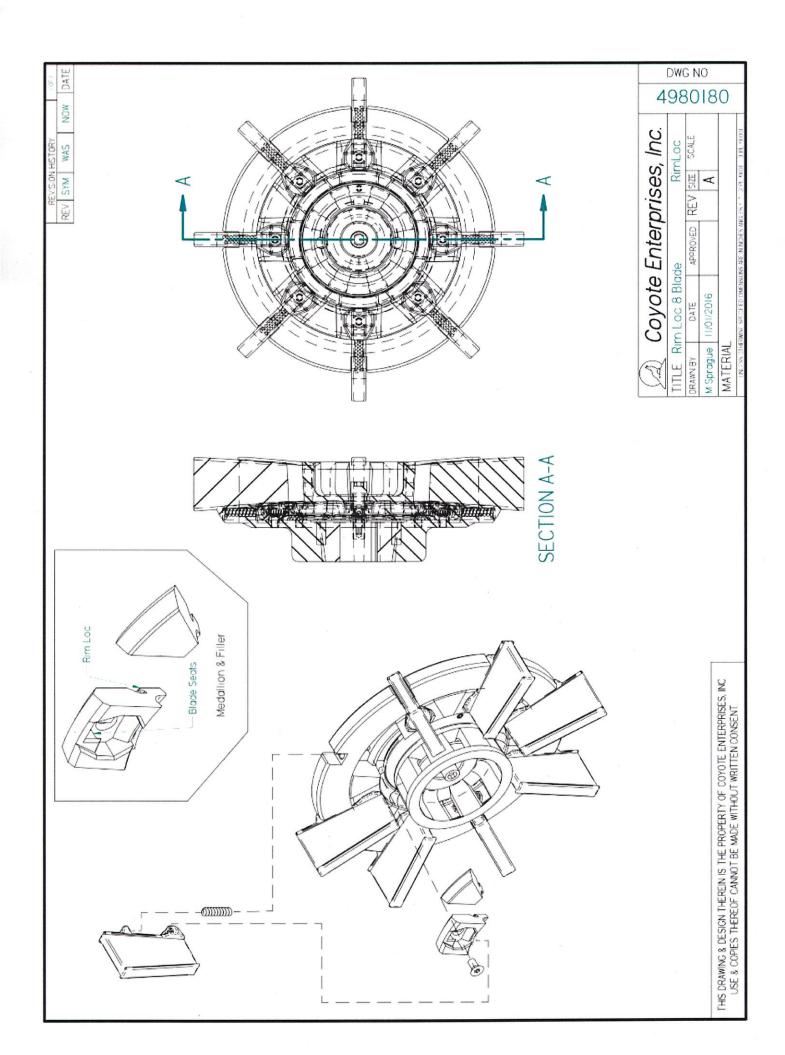
When the Blast Wheel is running the Amp Meter reading should be constant and steady. Any severe fluctuations can be interpreted as an indication of bearing trouble, "drag" from moving parts of the Blast Wheel, Motor malfunction or electrical supply variances.

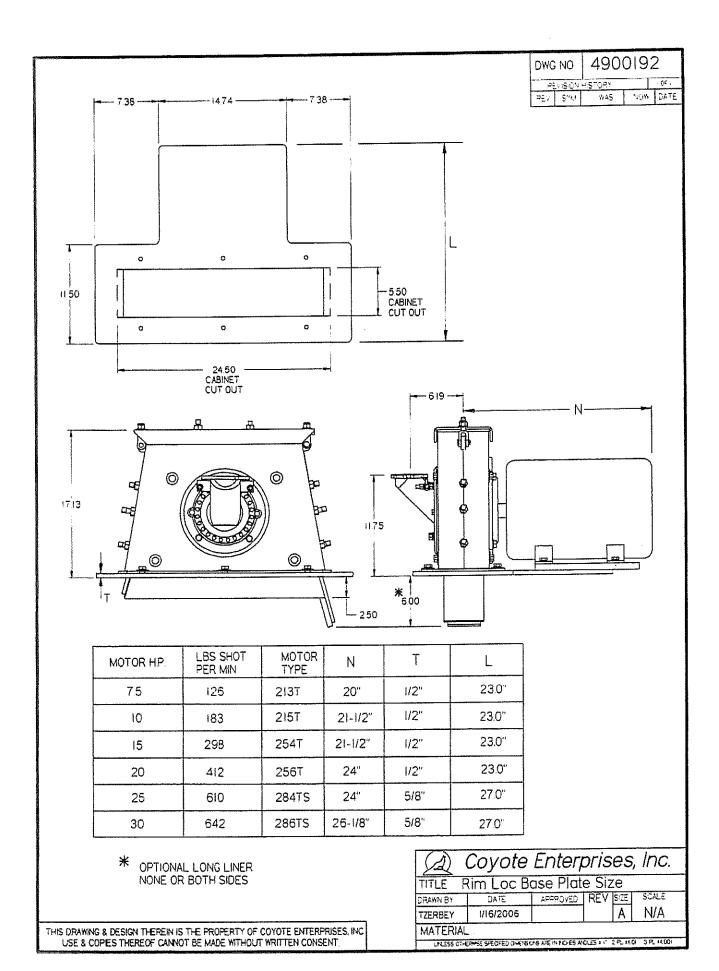
While the machine is in operation, any Amp Meter reading fluctuations should be investigated. Changes could indicate shortage of the Abrasive, stalled Elevator, clogged Screen or foreign objects in the Impeller. The Amp Meter serves as a prime indicator of proper or improper operation.

As the Abrasive Control Valve is opened, the amperage load will increase. The valve should be set so that the Motor will draw maximum rated amperage or run at 100 percent efficiency. Always run the Blast Motor at maximum efficiency (never overload). Monitor and adjust amperage as necessary.

An adjustable Stroke Air Cylinder operates the Valve Slide Plate. An Adjustment is made by loosening the jam nut and turning the Adjustment Bolt on the back of the cylinder. Turning the Bolt out allows more stroke by opening the Slide Plate which increases the abrasive flow and raises the amperage.







TAPER-LOCK® Bushings

These instructions must be read thoroughly before installation or operation.

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.

INSTALLATION:









1006 to 3030

3535 to 6050

3535 to 6050

- Insert Screws to Install
- Insert Screws to Remove
- Clean shaft, bore of bushing, outside of bushing and hub bore of all oil, paint and dirt. File away burrs.
- Insert bushing into hub. Match the hole pattern, not threaded holes (each complete hole will be threaded on one side only).
- "LIGHTLY" oil setscrews and thread into those half-threaded holes indicated by O on above diagram.

CAUTION: Do not lubricate the bushing taper, bushing bore, hub taper or the shaft. Doing so could result in breakage of the product.

- Position assembly onto shaft allowing for the small axial movement which will occur during lightening procedure.
- Alternately torque setscrews to recommended torque setting in chart below.

CAUTION: Do not use worn hex key wrenches. Doing so may result in a loose assembly or may damage screws.

- To increase gripping force, lightly hammer face of bushing using drift or sleeve. (Do not hit bushing directly with hammer.)
- Re-torque screws after hammering.

CAUTION: Where bushing is used with lubricated products such as chain, gear or grid couplings be sure to seal all pathways (where lubrication could leak) with RTV or similar material.

Recheck screw torques after initial run-in, and periodically thereafter. Repeat steps 5, 6 and 7 if loose.

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 Baldor Electric nor are the responsibility of Baldor Electric. 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.

TO REMOVE:

- 1. Remove all screws.
- Insert screws in holes indicated by on drawing. Loosen bushing by alternately tightening screws.

NOTE: If two bushings are used on the same component and shaft, fully tighten one bushing before working on another. When installing bushing in sintered steel product (sheave,coupling, etc.) follow torque recommendation shown on product hub if present.

Recommended Installation Wrench Torque		
Bushing No.	Lbln.	Nm
1008	55	6,2
1108	55	6,2
1210	175	19,9
1215	175	19,9
1310	175	19,9
1610	175	19,9
1615	175	19,9
2012	280	31,8
2517	430	48,8
2525	430	48,8
3020	800	90,8
3030	800	90,8
3525	1000	114
3535	1000	114
4030	1700	193
4040	1700	193
4535	2450	278
4545	2450	278
5040	3100	352
5050	3100	352
6050	7820	888
7060	7820	888
8065	7820	888
10085	13700	1556
12010	13700	1556

NOTE: When using TAPER-LOCK bushings with conveyor pulleys, refer to the DODGE Instruction Manual for TAPER-LOCK, H.E. , and QD Conveyor Pulley Bushings.



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

© Baldor Electric Company MN4044 (Replaces 499737) All Rights Reserved. Printed in USA. 2/11 TCP 25,000