Instruction Manual for Dodge® Raptor Couplings

These instructions must be read thoroughly before installing or operating this product. Video walkthroughs of each installation procedure are available by scanning the QR codes at the beginning of each section. Videos should be used as an accompaniment to the instruction manual and not intended to replace the written instructions. The instruction manual was correct at the time of printing. Please see www.baldor.com for updated instruction manual.

WARNING: To ensure the drive is not unexpectedly started, turn off and lock-out or tag-out power source before proceeding. Failure to observe these precautions could result in bodily injury.

Installation Instructions

Step 1 - HUB INSTALLATION

Before installing the hubs, ensure that shafts have been cleaned and are free of dirt, grease, and burrs. Verify that keys fit shafts properly.

FINISHED BORE CLEARANCE FIT

1. Hubs may be oriented as seen in Figure 2. Depending on shaft spacing requirements, determine the best hub orientation using Table 1.
2. If needed, hubs can be mounted with the shaft extending past the hub, flush, or recessed within the hub as seen in Figure 1.
3. Use a half element to set proper hub spacing, or reference Table 1 to set appropriate shaft spacing. Depending upon shaft spacing requirements, hubs may be oriented as seen in Figure 2 where A is the dimension between hub faces.
4. When hubs are properly spaced, tighten set screws to the torque value given in Table 1.

FINISHED BORE INTERFERENCE FIT

1. Hubs may be oriented as seen in Figure 2. Depending on shaft spacing requirements, determine the best hub orientation using Table 1.
2. If needed, hubs can be mounted with the shaft extending past the hub, flush, or recessed within the hub as seen in Figure 1.
3. Use a scribe to mark the desired hub location on shafts.
   a. Using an oven or oil bath, heat hubs evenly to 350°F (204°C) Do NOT exceed 450°F (232°C).
   b. An open flame or torch does not provide even heating and is NOT recommended.
4. Slide heated hubs onto shafts and align with the scribed marks.
5. Allow the hubs to cool to room temperature before installing element halves.

TAPER-LOCK & QD BUSHED HUBS

1. Hubs may be oriented as seen in Figure 2. Depending on shaft spacing requirements, determine the best hub orientation using Table 1.
2. Hubs must be mounted with 100% keyseat and shaft engagement, as seen in "A" or "B" of Figure 1.
3. Install bushings in hubs per bushing instructions:
   a. Taper-Lock – MN4044
   b. QD – MN4049

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 Company nor are the responsibility of Baldor Electric Company. 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 25 kg (55 lbs) are noted on the shipping package. Proper lifting practices are required for these products.
A - Shaft extended past hub (without contacting other shaft)

B - Shaft flush with hub

C - Shaft recessed in hub (requires 80% keyseat and shaft engagement)

Figure 1 - Hub Mounting Options

Outboard Method

Inboard Method

Hybrid Method

Figure 2 - Hub Orientation Options

Table 1 - Hub Spacing Between Shaft End Dimensions

<table>
<thead>
<tr>
<th>Hub Type</th>
<th>Straight Bore</th>
<th>QD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Outboard</td>
<td>Inboard</td>
</tr>
<tr>
<td>E2</td>
<td>1.90 48</td>
<td>1.34 34</td>
</tr>
<tr>
<td>E3</td>
<td>1.34 34</td>
<td>0.78 20</td>
</tr>
<tr>
<td>E4</td>
<td>1.34 34</td>
<td>0.42 11</td>
</tr>
<tr>
<td>E5</td>
<td>1.84 47</td>
<td>0.78 20</td>
</tr>
<tr>
<td>E10</td>
<td>1.84 47</td>
<td>0.52 13</td>
</tr>
<tr>
<td>E20</td>
<td>2.46 62</td>
<td>0.42 11</td>
</tr>
<tr>
<td>E30</td>
<td>2.55 65</td>
<td>0.45 11</td>
</tr>
<tr>
<td>E40</td>
<td>2.83 72</td>
<td>0.43 11</td>
</tr>
<tr>
<td>E50</td>
<td>3.47 88</td>
<td>0.53 13</td>
</tr>
<tr>
<td>E60</td>
<td>3.63 92</td>
<td>0.49 12</td>
</tr>
<tr>
<td>E70</td>
<td>4.00 102</td>
<td>0.52 13</td>
</tr>
<tr>
<td>E80</td>
<td>5.87 149</td>
<td>-  1</td>
</tr>
<tr>
<td>E100</td>
<td>3.77 96</td>
<td>1.77 45</td>
</tr>
<tr>
<td>E120</td>
<td>4.90 124</td>
<td>2.26 57</td>
</tr>
<tr>
<td>E140</td>
<td>5.02 128</td>
<td>3.02 77</td>
</tr>
</tbody>
</table>

1. All Inch fasteners are Grade 8.
2. All metric fasteners are ISO Class 10.9.
3. Fasteners are recommended for one time use only.
4. All fasteners use thread locking patches.

Table 2 - Set Screw Installation Torque for Clearance Fit Hubs

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>0.500-0.5625</th>
<th>0.625-0.875</th>
<th>0.9375-1.25</th>
<th>1.3125-1.75</th>
<th>1.8125-2.75</th>
<th>2.8125-3.25</th>
<th>3.125-4.000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setscrew Size</td>
<td>10-24NC</td>
<td>1/4-20NC</td>
<td>5/16-18NC</td>
<td>3/8-16NC</td>
<td>1/2-13NC</td>
<td>5/8-11NC</td>
<td>3/4-10NC</td>
</tr>
<tr>
<td>Torque (in-lb)</td>
<td>36</td>
<td>87</td>
<td>165</td>
<td>290</td>
<td>620</td>
<td>1225</td>
<td>2400</td>
</tr>
<tr>
<td>Torque (ft-lb)</td>
<td>3</td>
<td>7</td>
<td>14</td>
<td>24</td>
<td>52</td>
<td>110</td>
<td>200</td>
</tr>
<tr>
<td>Torque (Nm)</td>
<td>4</td>
<td>9.8</td>
<td>19</td>
<td>33</td>
<td>70</td>
<td>150</td>
<td>271</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Setscrew Size</th>
<th>11 - 34</th>
<th>35 - 47</th>
<th>48 - 69</th>
<th>70 - 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6 x 1.0</td>
<td>64</td>
<td>150</td>
<td>480</td>
<td>1185</td>
</tr>
<tr>
<td>M8 x 1.25</td>
<td>5</td>
<td>13</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>M10 x 1.5</td>
<td>7.2</td>
<td>17</td>
<td>54</td>
<td>134</td>
</tr>
</tbody>
</table>
**Step 2 – VERIFY ALIGNMENT**

Coupling hubs should be aligned using scales, straight edges, or calipers. Dial indicators, laser alignment tools, or other precision alignment equipment can be used but are not required.

1. Adjust equipment to achieve the desired distance between hub ends. Refer to dimension “A” in Figure 2 and Table 1.

2. Using scales or calipers, check the angular misalignment by measuring dimension “B” at four places on the outer diameter of the hub 90° apart, as shown in Figure 3. Use the “B1” and “B2” measurements to calculate “C”. Adjust the equipment until the “C” measurements do not exceed the value in Table 3.

3. Check parallel misalignment by placing a straight edge across the outside diameter of the hubs and measuring the gap between the straight edge and the hub at four locations 90° apart, as seen in Figure 4. Adjust equipment until the gap does not exceed the value shown in Table 3.

**Step 3 - ELEMENT INSTALLATION**

1. Place first element half on hubs and hand-tighten the flange head bolts.

**NOTE - When tightening the bolts, start at the center bolt hole and then install the bolts on the neighboring holes.**

2. Place the second half of the element on the hubs and follow the same procedure. Hand-tighten the flange head bolts.

3. Use a torque wrench to tighten all fasteners to the torque values listed in Table 4.

**ATEX CERTIFICATION**

These instructions do not cover all details or variations in equipment nor provide every possible contingency or hazard to be met in connection with installation, operation, and maintenance. Should further information be desired, or should particular problems arise which are not covered in this manual, the matter should be referred to your local Baldor® Dodge representative.

Dodge Raptor couplings are manufactured under guidelines of the ATEX directive 2014/34/EU. Dodge Raptor couplings are suitable for ATEX category 2 and M2, Group II and I for gas and dust environments and are also suitable for ATEX category 3 for all gas or dust environments with ignition temperatures higher than T5 = 100°C. A UL Certified adhesive label indicating ATEX certification will be attached to the product and will contain the certification and corresponding data.

**ATTENTION – HAZARDOUS AREA USE**

For Hazardous Area Use, the following potential ignition hazards have been identified:

- Heat Generation
- Contact of rotating parts with stationary parts

These potential hazards have been addressed by the materials and design of the coupling and rely on correct installation and maintenance, as detailed in the equipment instructions.

**WARNING:** These couplings are designed to operate with surface temperatures below 100°C when properly installed and selected. Excessive temperatures greater than 80°C is a result of an abnormal operating condition caused by:

- Improper installation – refer to installation manual for proper procedures

**A.** Excessive misalignment – re-align coupling/shafts

**B.** Failure of the element – replace element assembly

**C.** Excessive speed – re-evaluate application and selection

**D.** Excessive vibration – determine source, re-evaluate application

For further information, please contact your local Baldor® Dodge representative.
If applied in a Division 1 or Zone 1 environment, the excessive temperature may cause ignition of hazardous materials.

In hazardous environments, Dodge Raptor Couplings should not be considered fail safe or “break-away” power transmission devices. Overloads imposed to these devices could cause irreparable damage, shall be considered an explosive hazard, could create projectiles, and/or could cause torque transmission interruptions. The coupling shall be sized and used to the stated torque ratings of the unit as published in the appropriate Baldor•Dodge Engineering Catalog. Any assistance needed in selection shall be referred to a Baldor•Dodge representative.

**ADDITIONAL INSTRUCTION FOR SAFE INSTALLATION AND USE**

1. All rotating parts should be guarded to prevent contact with foreign objects which could result in sparks, ignition, or damage to the coupling.

2. Couplings should be periodically inspected for normal wear, dust/dirt buildup, cracks or tears in the element assembly or any similar scenario that would impede heat dissipation.

3. Increasing levels of vibration and noise could indicate the need for inspection, repair or replacement of the coupling or element.

4. Electrical sparks are a source of ignition. To reduce the risk, proper electrical bonding and grounding is recommended.

5. Overloading may result in tearing or damage to the coupling element or other equipment. As a result the coupling could become an explosion hazard. Damaged coupling components must not be operated in hazardous environments.

6. Raptor Couplings are not intended to be used as thrust bearing members.

7. Coupling guards should have a minimum of 2" clearance over Dodge Raptor Couplings.

8. The coupling shall be suitably protected from falling objects.

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**EU Declaration of Conformity**

The undersigned, representing the following supplier and the following authorised representative:

- **Baldor Electric Company**
  5711 R. S. Boreham, Jr. Street
  Fort Smith, Arkansas 72901
  USA

- **ABB Automation Products GmbH**
  Oberhausener Straße 33
  40472 Ratingen, Germany

This declaration is issued under the sole responsibility of the manufacturer.

hereby declare that the Products

- Couplings
  Dodge Raptor - Equipment Group I, Category M2 c /Equipment Group II Category 2 GD c 100 °C (T5) T amb -30°C to +50°C

are in conformity with the provisions of the following EC Directive(s) when installed in accordance with the installation instructions contained in the product documentation:

- 94/9/EC and 2014/34/EU (ATEX)

Note 1: 94/9/EC applies until April 19, 2016, 2014/34/EU applies from April 20, 2016

and that the standards and/or technical specifications referenced below have been applied:

- EN 13463-1:2009 - Non-Electrical Equipment For Potentially Explosive Atmospheres - Method And Requirements
- EN 13463-5:2011 - Non-Electrical Equipment For Potentially Explosive Atmospheres – Part 5 Protection by constructional safety 'c'

**Notified Body:**
Sira Certification Services Ltd
Unit 6
Hawarden Industrial Park
Hawarden
DEESIDE
CH5 3US

**Certificate:** SIRA 15ATEX6170X

**Supplier:** L. Evans Massey
**Position:** Manager Standards and Certification
**Date:** 1 April 2016

**Authorised representative:** Michael Klein
**Position:** Regional Sales and Marketing Manager Central Europe
**Date:** 1 April 2016