



INSTRUCTION MANUAL IM-400

Removing a Nut from a Damaged Coupling Bolt

Applicable Riverhawk Part Numbers

All GE Gas Turbine Coupling Hardware

A complete 'Nut Buster' Kit that is designed to work with a specific turbine model can be ordered directly from Riverhawk. Contact info@riverhawk.com or call (315)768-4855 for more information.

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1.0 Cautions and Safety Warnings

WARNING

Improper tool use and the failure to follow the correct procedures are the primary root causes of tool failures and personal injuries. A lack of training or experience can lead to incorrect equipment installation or use. Only trained operators should service hydraulic pumps and hydraulic tools.

CAUTION

Personal injury and equipment damage can occur if the proper health and safety codes and procedures are not followed. Contact the site’s health and safety office to determine all applicable safety rules and regulations.

WARNING

The proper personal protective equipment must be worn at all times.

WARNING

Trying to install or remove a damaged stud may cause further damage to the stud, flange, or to the tensioner itself. Using a tensioner on a damaged stud is hazardous to the operator.



WARNING

Stay clear of the back of the flange. As the nut is drilled and split, most of the force in the stud will dissipate. However there may be some amount of force still in the stud and as the nut is split the stud may jump backwards away from the operator.

CAUTION

Care must be taken to not drill into the coupling. Check drilling depth and mark drill bit to prevent drilling through the nut into the flange.

CAUTION

The coupling bolts are made of a heat treated alloy steel. When drilling through the nut; be sure to use plenty of oil and drill slowly. Drilling too fast and without enough oil can cause the steel to work harden and make drilling very difficult.

2.0 Scope

This document describes the procedure for removing a nut from a damaged coupling bolt.

If the internal threads of a coupling bolt become damaged, it will be necessary to remove the stud by means other than tensioning. This is necessary as once the internal threads are damaged, the threads' structural strength has been compromised. The reduced thread strength may not be sufficient to successfully remove the damaged bolt without the tensioner disengaging from the stud.

This procedure outlines one method that can be used to remove a damaged coupling bolt. Depending on flange type, bolt size, and equipment available on site, other methods may also be acceptable for removing the nut and stud from the flange.

3.0 Description

This procedure details a method to remove the nut from a tensioned damaged stud by drilling two holes 180 degree's apart through the nut, axially and then using a chisel to split the nut in half. This will allow removal of the nut and stud from the flange.



4.0 Tools Needed

1. 1/2" [13mm] Heavy Duty Variable Speed Hand Drill
2. 2 lbs [1 KG] Hammer (or similar)
3. Various Cobalt Drill Bits - Starting with 9/32" [7mm] and working up in three or four steps to maximum size
4. Quality Cutting Fluid
5. 1/2" [12mm] Wide Splitting Chisel
6. Tapered Pin Punch

5.0 Drilling Procedure

WARNING

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WARNING

The proper personal protective equipment must be worn at all times.

CAUTION

Care must be taken to not drill into the coupling. Check drilling depth and mark drill bit to prevent drilling through the nut into the flange.

CAUTION

The coupling bolts are made of a heat treated alloy steel. When drilling through the nut; be sure to use plenty of oil and drill slowly. Drilling too fast and without enough oil can cause the steel to work harden and make drilling very difficult.

1. The first step is to measure the nut to determine drill bit sizing and drilling depth.
 - A. Using a caliper; measure the wall thickness of a removed nut from another stud. Select a drill bit that is approximately .062" [1.5mm] smaller in diameter than the wall thickness of the nut. This will be the last drill bit you use to drill the nut in a series of steps. A 9/32" [7mm] drill bit makes a good starting point and select one or two other, in-between sizes for the intermediated drilling.

Example: A 2.25" [57mm] nut with a wall thickness of about .635" [16.1mm] could use a final drill bit size of 9/16" [14mm]. You would start with a 9/32" [7mm] drill bit then move to approximately a 25/64" [10mm] and finally finish with the 9/16" [14mm] bit.



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- B. Next, measure the overall length of the nut and subtract $1/16''$ [1.6mm] from the length. This will be the maximum drilling depth.



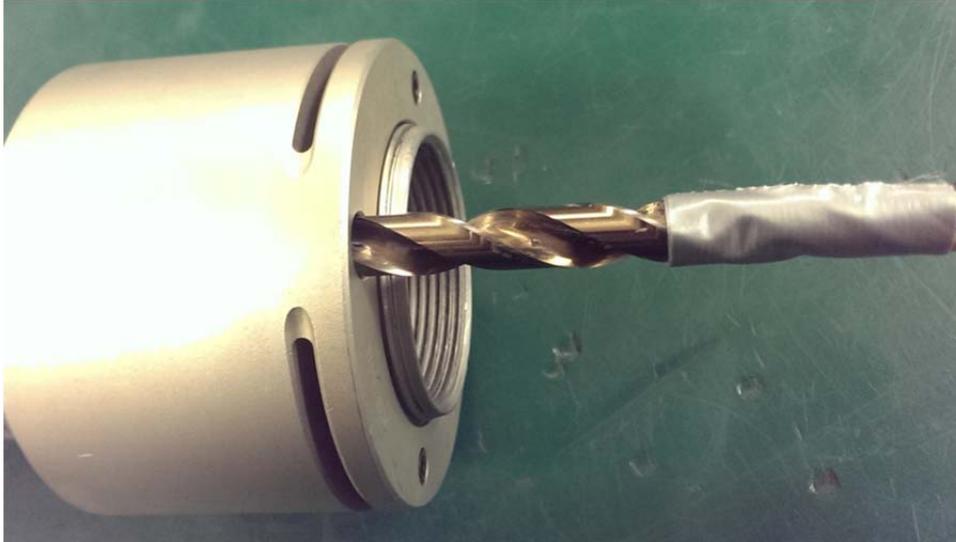
2. Mark each drill bit with the maximum drilling depth to ensure the drill bit doesn't pass completely through the nut and into the flange. Be sure to measure from the point of the drill bit as this would be the deepest point of the drilled hole.



Drill measured and marked with tape



3. Drill ***straight*** through the nut starting at one of the two spanner ring holes using the smallest selected drill size, in this case the 9/32" [7mm] drill bit. Be sure to use plenty of cutting oil and to proceed slowly. This is to prevent the nut from work hardening as you drill. Once the hole is drilled to the correct depth, move to the other spanner ring hole and do the same.



Drilling through spanner ring hole

4. After both holes have been drill with the smallest drill bit, move to the next drill bit up in size. Continue to drill out each hole while maintaining the same drill depth so as to not drill into the coupling flange. Repeat this process until the largest drill bit has been used. At this point there should only be a thin wall of material left holding the nut together.



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- Using the splitting chisel, start splitting the outside wall of the drilled hole. You may need to alternate between the chisel and the splitting pin punch and move from one hole to another to be able to split the nut in half.



WARNING

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6.0 Revision History

Revision Letter	Effective Date	Description
-	Aug 1, 2016	Initial Release



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