INSTRUCTION MANUAL IM-157
For Windage Plugs used with Gas and Steam Turbine's Tensioned Hardware

Applicable Riverhawk Part Numbers

7001354	7002021	7003292
7001652	7002027	7003293
7001818	7002259	7003510
7001867	7002247	7003513
7001880	7002491	7003603
7001983	7002590	7003614
7001985	7002756	

Applicable GE Ordering Sheet Part Numbers

No Specific Ordering Sheet Part Numbers

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GE Power & Water — GENERAL ELECTRIC COMPANY

VENDOR SUPPLIED

GE NOT TO REVISE. GE REVISION LEVEL IS SHOWN ON THIS APPLIQUE.
THIS DOCUMENT IS FILED UNDER THE GE DRAWING NUMBER.

THIS DOCUMENT SHALL BE REVISED IN ITS ENTIRETY. ALL SHEETS OF THIS DOCUMENT ARE THE SAME REVISION LEVEL AS INDICATED IN THIS VENDOR SUPPLIED DRAWING APPLIQUE.

MLI: ____ OF ____

GE SIGNATURES	DATE	GE DRAWING NUMBER	REV
CHECKED:		373A4023	
ISSUED:			

The Riverhawk Company reserves the right to update this document without dissemination or notice. The latest revision may be obtained by contacting Riverhawk Company or thru www.riverhawk.com.

Repairs – Rentals
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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 hardware installation or incorrect tool use. Only trained operators with careful, deliberate actions should use this equipment.

CAUTION

This equipment requires moderate levels of torque for installation. Operators must exercise caution and wear the appropriate personal protective equipment when handling and operating the windage plugs and their associated installation tools.

CAUTION

It is important to check the condition of the threads used to connect the windage plug to the stud. Thread damage from previous abuse can lead to failure of the windage plug's mechanical locking feature.

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.

CAUTION

Before installation, carefully check the cleanliness of the windage plug's and the stud's threads. Apply a light coat of clean turbine oil to the stud's conical thread. This procedure will ease assembly before tightening. Do not use "Never Seize" on any surface or thread.

WARNING

Do not use Loctite on any of the threads and do not stake any component of this assembly.

CAUTION

Do not exceed the maximum torque listed in this manual. Excessive torque can damage the windage plug, stud, and installation tools.

2.0 Scope

This document describes the proper use of a Riverhawk windage plug. The figures in this manual depict the installation and removal procedures.

Riverhawk P/N		
7001354	7002021	7003292
7001652	7002027	7003293
7001818	7002259	7003510
7001867	7002447	7003513
7001880	7002491	7003506
7001983	7002590	7003614
7001985	7002756	

Along with other identifying markings, the windage plug's part number can be found on the plug's top surface as shown in the picture below.

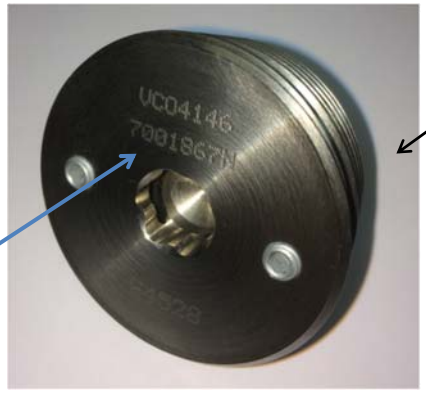
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Picture 2A – Windage Plug's Markings

3.0 General Preparations

3.1 Installation Preparations

WARNING

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

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.

CAUTION

It is important to check the condition of the threads used to connect the windage plug to the stud. Thread damage from previous abuse can lead to failure of the windage plug's mechanical locking feature.

Read and understand all instructions before installing the windage plug.

Operators should be trained or have previous experience using Riverhawk equipment. Training will minimize the chance of improper use of the equipment.

The windage plug should be inspected prior to use. Examine the threads for any signs of damage. Damage threads may prevent the windage plug's locking feature from engaging correctly. The threads should be clean of any dirt or debris such as residual Loctite or Never-seize compound.

If there is any visible damage on a windage plug, do not use the plug and contact the Riverhawk Company for a replacement plug. Please be prepared to supply the turbine number, weight certification, and digital photographs for evaluation.

Studs must have been installed and tensioned in accordance with their relevant Riverhawk instruction manuals. Installed studs may require cleaning. Clean conical threads should have a bright and shiny appearance. For instructions on how to clean the stud's conical thread, refer to Riverhawk Instruction Manual IM-220 (GE Vendoc 373A4025).

Standard hand tools are required for installation including a set of Inch-sized Allen wrenches and a flat-blade screwdriver.

3.2 Removal Preparations

WARNING

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

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.

Read and understand all instructions before installing the windage plug.

Operators should be trained or have previous experience using Riverhawk equipment. Training will minimize the chance of improper use of the equipment.

The windage plug should be inspected prior to use. Examine the threads for any signs of Loctite compound or for any stake marks. Remove any much Loctite as possible and any stake marks since these will prevent the removal of the plug. Applying a penetrating oil to the threads may assist with removal.

The windage plugs' set screws should be examined for damage to its hex drive. If the set screw's hex drive is damaged, it will be necessary to drill out the set screw and replace the windage plug.

If there is any visible damage on a windage plug, do not reuse the plug and contact the Riverhawk Company for a replacement plug. Please be prepared to supply the turbine number, weight certification, and digital photographs for evaluation.

Standard hand tools are required for installation including a set of Inch-sized Allen wrenches and a flat-blade screwdriver.

4.0 Operation

4.1 Windage Plug Installation

CAUTION

This equipment requires moderate levels of torque for installation. Operators must exercise caution and wear the appropriate personal protective equipment when handling and operating the windage plugs and their associated installation tools.

CAUTION

It is important to check the condition of the threads used to connect the windage plug to the stud. Thread damage from previous abuse can lead to failure of the windage plug's mechanical locking feature.

WARNING

Do not use Loctite on any of the threads and do not stake any component of this assembly.

CAUTION

Do not exceed the maximum torque listed in this manual. Excessive torque can damage the windage plug, stud, and installation tools.

To install the windage plug, use the following instructions:

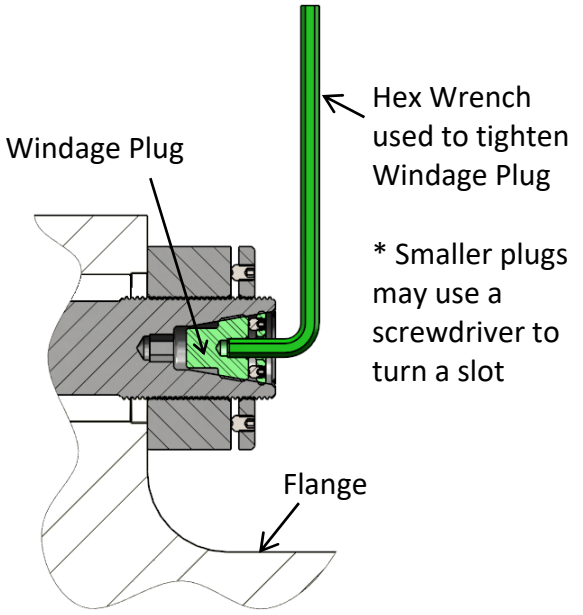
1. Studs and nuts must had been installed and tensioned in accordance with their relevant Riverhawk instruction manual.
2. Inspect the stud's conical thread. It should have a bright and shiny appearance. The threads should be visually checked for any damage. Refer to Riverhawk Instruction Manual IM-220 (GE Vendoc 373A4025) for assistance.
3. Apply a light coat of clean turbine oil to the stud.

CAUTION

Before installation, carefully check the cleanliness of the windage plug's and the stud's threads. Apply a light coat of clean turbine oil to the stud's conical thread. This procedure will ease assembly before tightening. Do not use "Never Seize" on any surface or thread.

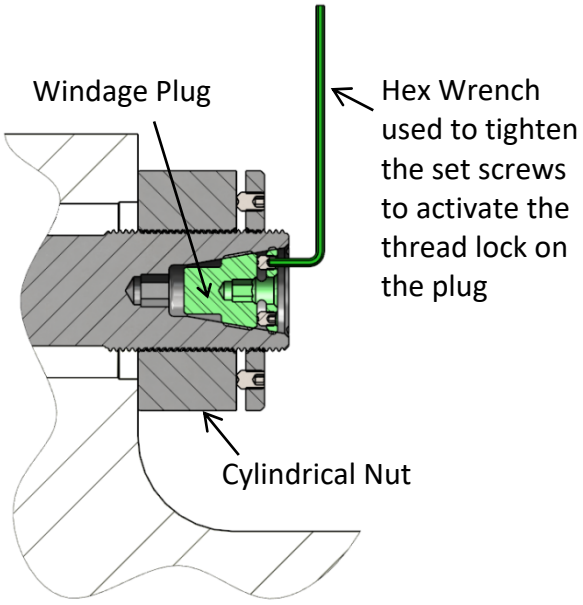
4. Thread the windage plug into the conical thread of the stud. The windage plug must not be cross-threaded when installed. Apply the following torque to seat the windage plug into the stud.

Riverhawk P/N	Installation Torque
7002021	50-100 in-lbs. [5.6-11 Nm]
7001354, 7001652 7001880, 7001983 7001985, 7002027 7002447, 7003510 7003614	100-150 in-lbs. [11-17 Nm]
7001818, 7001867 7002259, 7002491 7003513, 7003603	200-250 in-lbs. [22.6-28.2 Nm]
7002590, 7002756 7003292, 7003293	350-450 in-lbs. [39.5-50.8 Nm]



5. The windage plug includes a locking feature similar to the locking feature of the cylindrical nuts. The set screws must be torqued to the following amount. These set screws will cause the top section of the windage plug to lock onto the stud's threads.

Riverhawk P/N	Installation Torque
7001354, 7001652 7001880, 7001983 7001985, 7002021 7002027, 7002447, 7003510, 7003614	25-35 in-lbs. [2.8-4.0 Nm]
7001818, 7001867 7002259, 7002491 7002590, 7002756 7003603	80-90 in-lbs. [9.0-10.1 Nm]
7003292, 7003293 7003513	145-155 in-lbs. [16.4-17.5 Nm]



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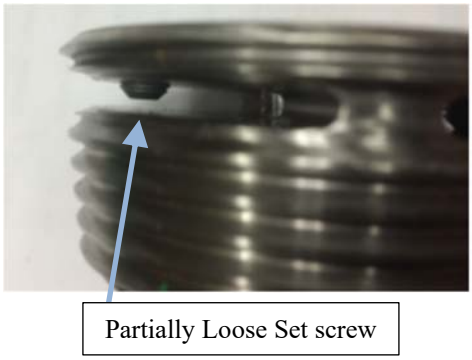
WARNING

Do not use Loctite on any of the threads and do not stake any component of this assembly.

6. The windage plug should be at least 0.060” [1.5 mm] below the face of the stud for the locking feature to work correctly. If not, loosen set screws and reexamine the stud’s and plug’s threads for debris or damage. It may be necessary to replace the plug.

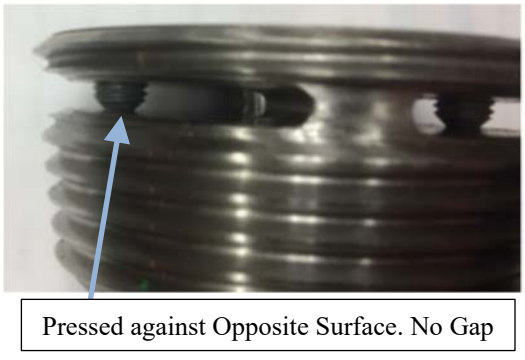
7. The set screws should flush to slightly below the top of the windage plug. The set screw should also press against the slot’s opposite surface.

Wrong Installation Position



Partially Loose Set screw

Correct Installation Position



Pressed against Opposite Surface. No Gap

8. Return any unused windage plugs to its storage container and refer to section 6.0 on long term storage of the tooling.

4.2 Windage Plug Removal

The removal process is the same installation steps performed in reverse order. See section 3.2 for additional inspection steps to be taken prior to removal.

5.0 Service and Maintenance

No service or Maintenance is required during turbine operation. All service or maintenance activities can occur during scheduled or unscheduled outages.

For best performance, the windage plug set screws should be replaced after the windage plugs have gone thru five removal cycles. The set screws will still perform their function after five removal cycles, but the set screws may become more difficult to loosen.

During outages, examine the windage plugs for any damage. If there is any visible damage on a windage plug, do not reuse the plug and contact the Riverhawk Company for a replacement plug. Please be prepared to supply the turbine number, weight certification, and digital photographs for evaluation.

6.0 Storage Instructions

Follow these directions to properly store your windage plugs.

Examine the parts for any visual damage. If there is any visible damage, do not store the windage plug and contact the Riverhawk Company for a replacement. Please be prepared to supply site information, the turbine number, weight certification, and digital photographs for evaluation.

CAUTION

It is important to check the condition of the threads used to connect the windage plug to the stud. Thread damage from previous abuse can lead to failure of the windage plug's mechanical locking feature.

Clean the windage plug with a wire brush using a petroleum-based solvent to remove any foreign material on the external surfaces and threads.

Apply a light coat of clean turbine oil to the parts and wrap the parts in VCI-impregnated paper for placement in the long-term storage box. Do not wrap the parts in plastic.

7.0 Revision History

Revision Letter	Effective Date	Description
U	Mar 19, 2026	Added 7003614 to title page, section 2.0, and section 4.1
T	Apr 16, 2025	Added 7003603 to title page, section 2.0, and section 4.1
R	Feb 1, 2023	Increased 7003513 set screw torque to 145-155 in-lbs.

Revision Letter	Effective Date	Description
P	Aug 25, 2022	Added 7003513 to title page, section 2.0, and section 4.1
N	Apr 21, 2022	Added 7003510 to title page, section 2.0, and section 4.1
M	Jan 24, 2022	Updated EC Declaration of Conformity; Added UKCA Declaration of Conformity
L	Nov 12, 2019	Removed duplicate entries for 7002590 and 7002756 in section 4.1, step 4
K	Aug 8, 2018	Added 7003292 and 7003293 to title page, section 2.0, and section 4.1; Revised installation torque for 7002590 and 7002756; Inserted step 7 to section 4.1
J	Apr 3, 2017	General Update; Added new pictures and figures; Added preparation and storage information; Added inspection guidelines and cleaning instructions; Added additional Riverhawk windage plug part numbers
H	Jun 13, 2014	Added Appendix A1
G	Sep 16, 2011	Added Figure 5
F	Dec 3, 2010	Added wrench sizes
E	Jun 25, 2008	Added GE applique
D	Apr 4, 2007	Revised appearance of figures 1 and 2; Added HF-2322 to figure 1; Added HF-3133 and 7001145 to figure 2; Added figures 3 and 4.
C	Nov 2, 2006	Added minimum .06” distance to Figures 1 and 2
B	Nov 1, 2006	Added windage plug installation torque to Figures 1 and 2
A	Aug 11, 2004	Added title page and Figure 2

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Revision Letter	Effective Date	Description
-	Jul 9, 2004	Released

Appendix A1

EC Declaration of Conformity

Manufacturer: Riverhawk Company
Address: 215 Clinton Road
New Hartford, NY 13413, USA

The hydraulic pump and bolt tensioning tool described in this manual are used for installing and applying tension to large bolts that are specifically designed by Riverhawk Company to be tensioned hydraulically.

All applicable sections of European Directive 2006/42/EC for machinery have been applied and fulfilled in the design and manufacture of the hydraulic pump and bolt tensioning tool described in this manual. Reference also ISO 12100:2010, ISO 4413:2010, and ISO 4414:2010.

Furthermore, this equipment has been manufactured under the Riverhawk quality system per EN ISO 9001:2015

Consult the Declaration of Conformance included with the shipment of this equipment that identifies the authorized Riverhawk representative, applicable serial numbers, and appropriate signature.

Appendix A2

UKCA Declaration of Conformity

Manufacturer:	Riverhawk Company
Address:	215 Clinton Road New Hartford, NY 13413, USA

The hydraulic pump and bolt tensioning tool described in this manual are used for installing and applying tension to large bolts that are specifically designed by Riverhawk Company to be tensioned hydraulically.

All applicable sections of Supply of Machinery (Safety) 2008 have been applied and fulfilled in the design and manufacture of the hydraulic pump and bolt tensioning tool described in this manual. Reference also ISO 12100:2010, ISO 4413:2010, and ISO 4414:2010.

Furthermore, this equipment has been manufactured under the Riverhawk quality system per EN ISO 9001:2015

Consult the Declaration of Conformance included with the shipment of this equipment that identifies the authorized Riverhawk representative, applicable serial numbers, and appropriate signature.