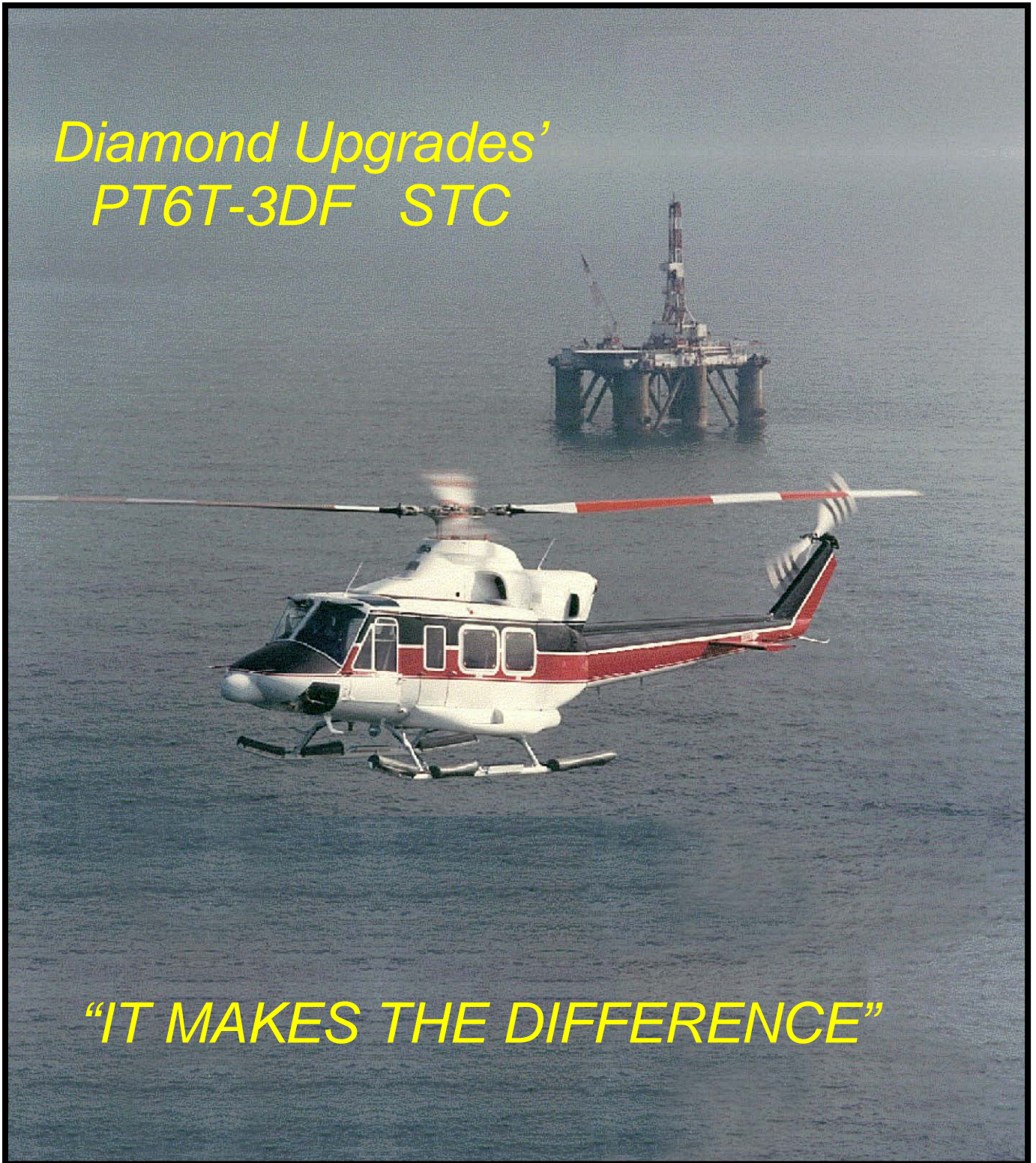


# *The 412 DF Upgrade*

*Diamond Upgrades'  
PT6T-3DF STC*



*“IT MAKES THE DIFFERENCE”*

# *Diamond Upgrades*

920 North King Street, Second Floor, Wilmington, DE 19801  
1.602.527.7875 – FAX 1.602.340.1916

## Diamond Upgrades:

Diamond Upgrades is a company that creates safety and performance upgrades through FAA and EASA Approved STCs

## Our Products:

Our STCs allows the Pratt & Whitney PT6T-3DF Twin Pac to be installed in any Bell 212, or 412.

These STCs increase **Safety** and **Commonality** for Bell 212's, Bell 412s, Bell 412 SPs, and Bell 412 HPs.

In addition to increased single engine performance, a Bell 212 or Bell 412 equipped with a Pratt & Whitney PT6T-3DF Twin-Pac will have greater  $N_1$  and ITT operating margins when operating in all areas, particularly at high altitudes and in hot areas. This should result in lower maintenance and overhaul costs.

## Fleet Enhancement Package

**Pratt & Whitney** is presently offering a **Fleet Enhancement Program**, (or FEP) for these upgrades.

Please ask your Pratt & Whitney sales representative about the **Diamond Upgrades PT6T-3DF FEP** to discover the price advantages.

## The Bell 412 STC:

The latest revision to the original STC allows for the installation of PT6T-3DF Twin Pac in the Bell 412 with two options:

Part I allows the Bell 412 helicopter to retain the existing instruments and markings and operate the PT6T-3DF at existing (PT6T-3B) power settings while enjoying improved fleet engine commonality, and better engine thermodynamic and RPM margins.

Part II allows the helicopter to utilize greater OEI performance and flight planning by using the provided OEI Climb and Hover charts and installing re-marked instruments.

## Getting Started:

Please contact us:

For the Americas: **Larry Karpurk 602.527.7875** or [Larry.Karpurk@DiamondUpgrades.com](mailto:Larry.Karpurk@DiamondUpgrades.com)

In Europe: **Roy Knaus: +43 (0)6462-4200** or [www.heli-austria.at](http://www.heli-austria.at)

May 22, 2020



United States Of America  
Department of Transportation - Federal Aviation Administration  
**Supplemental Type Certificate**

*Number* SR01180LA

*This Certificate issued to* DIAMOND UPGRADES, LLC  
920 KING STREET  
2<sup>ND</sup> FLOOR  
WILMINGTON, DE 19801

*certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 29\* of the Federal Aviation Regulations. \*Certification basis is set forth in Type Certificate Data Sheet H4SW*

*Original Product Type Certificate Number:* H4SW

*Make:* Bell

*Model:* 412

*Description of Type Design Change:* Installation of Pratt & Whitney PT6T-3DF Twin-Pack in place of PT6T-3B, -3BE, -3BF, -3BG Twin Pack, in accordance with Airplane Upgrades' Installation Instruction AU-412010420, Revision N/C, dated April 20, 2001, or later FAA approved revision. FAA Approved Rotorcraft Flight Manual Supplement No. AU-412010423, dated June 28, 2001, or later FAA approved revision is required with this installation.

*Limitations and Conditions:* The installation should not be incorporated in any aircraft unless it is determined that the interrelationship between this installation and any previously approved configuration will not introduce any adverse effect upon the airworthiness of the aircraft. The approval of this modification applies to the above-noted rotorcraft model series only and the incorporation of Bell Helicopter Technical Bulletin 412-84-44, 412-90-84, 412-93-118, 412-99-152, and 412-99-165. (See page 3). A copy of this STC must be included in the permanent records of the modified aircraft. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

*This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.*

*Date of application:* April 22, 2001

*Date reissued:* October 11, 2012

*Date of issuance:* June 28, 2001

*Date amended:* January 22, 2003, March 12, 2004



*By direction of the Administrator*

(Signature)

Manager, Propulsion Branch  
Los Angeles Aircraft Certification Office  
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.



Transport  
Canada

Aviation

Transports  
Canada

Aviation

Suite 620  
800 Burrard Street  
Vancouver, B.C.  
V6Z 2J8

Your file      Votre référence

Our file      Notre référence

P-04-0436

August 09, 2004

Mr. Larry W. Karpurk  
Airplane Upgrades  
321 West Palm Lane  
Phoenix, Arizona  
85003 USA

Subject: Acceptance of Foreign STC SR01180LA

This is in response to FAA LA ACO letter dated May 24, 2004 requesting Transport Canada approval of the subject STC.

In accordance with our current policy associated with the review of foreign STCs, some STCs applicable to certain categories of aircraft may be accepted solely on the basis of their foreign certification, and do not require the issue of a corresponding certificate by Transport Canada. The subject STC falls within these criteria.

This STC will be entered in the national index of STCs that have been reviewed and accepted by Transport Canada for installation on Canadian-registered aeronautical products.

This letter confirms formal acceptance of the referenced STC by Transport Canada.

Should you require any additional information, please do not hesitate to contact the undersigned at (604) 666-5593.

Yours truly,

Paul Arnell  
Aircraft Certification Engineer  
for  
Regional Manager Aircraft Certification

Cc: Ms. Sharon L. Kennedy, LAACO - ANM-103L

Canada



## SUPPLEMENTAL TYPE CERTIFICATE

**10044868**

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EU) No. 748/2012 to

### **DIAMOND UPGRADES, LLC**

**920 KING STREET, 2ND FLOOR  
WILMINGTON DE 19801  
USA**

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

**Original Type Certificate Number : FAA H4SW  
Type Certificate Holder : BELL HELICOPTER TEXTRON  
Type Design - Model : 412  
Original STC Number : FAA STC SR01180LA**

#### **Description of Design Change:**

PART 1: INSTALLATION OF PRATT&WHITNEY CANADA PT6T-3DF TWIN-PAC POWER PLANT WITHOUT INCREASED PERFORMANCE CAPABILITY.

PART 2: INSTALLATION OF PRATT&WHITNEY CANADA PT6T-3DF TWIN-PAC POWER PLANT AND INSTRUMENT CHANGE WITH INCREASED PERFORMANCE CAPABILITY.

This STC allows for removal of the P&W PT6T-3B, -3BE, -3BF, or -3BG engine from Bell 412 helicopters and the installation of a P&W PT6T-3DF engine in accordance with Installation Instructions Document AU-412010420. The addition of Instrument Change (Part 2) allows an increase of performance capabilities in accordance with RFM Supplement AU-412010423.


#### **EASA Certification Basis:**

The Certification Basis (CB) for the original product remains applicable to this certificate/ approval. The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

See Continuation Sheet(s)

**For the European Aviation Safety Agency,**

**Date of issue: 13 May 2013**

  
**Massimo MAZZOLETTI**  
**Certification Manager**  
**Rotorcraft, Balloons, Airships**

#### **Note:**

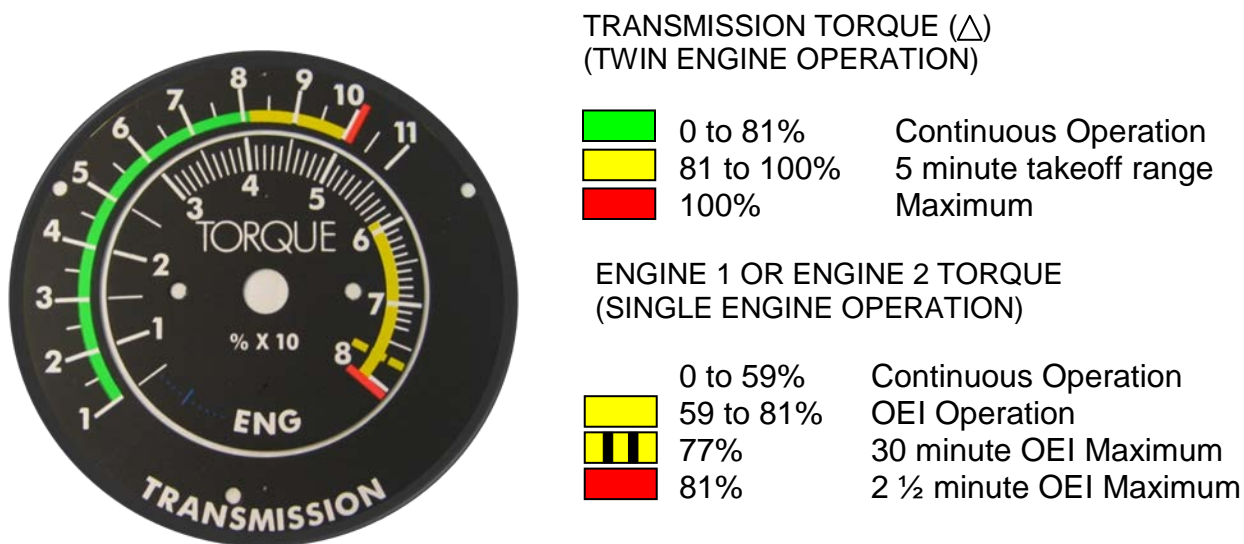
The following numbers are listed on the certificate:  
EASA current Project Number: 0010020903-001

SUPPLEMENTAL TYPE CERTIFICATE - 10044868 - DIAMOND UPGRADES, LLC

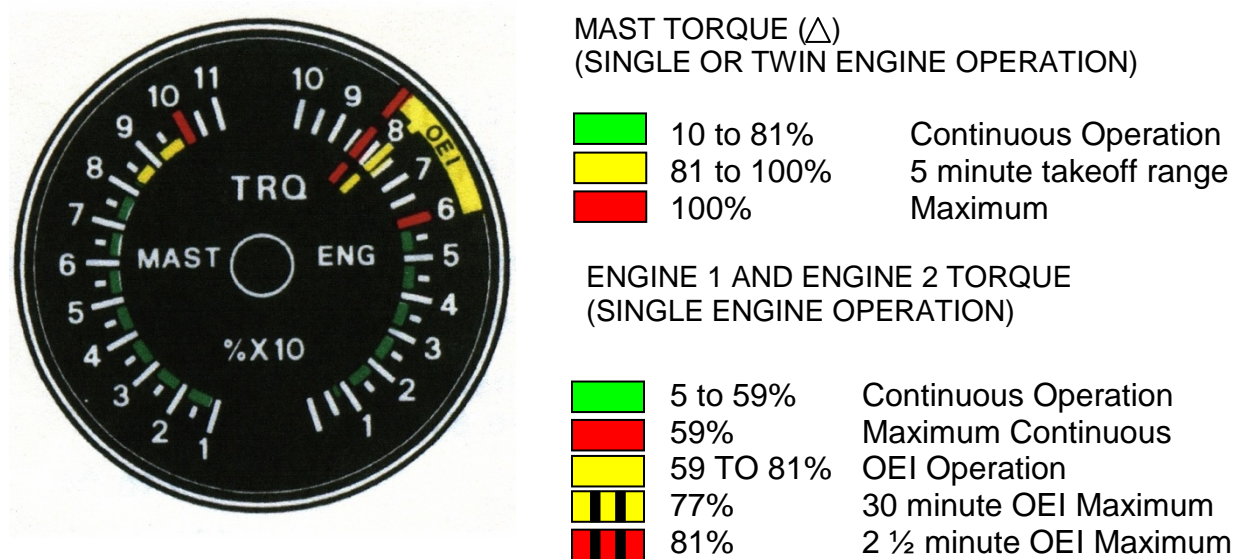


## INSTRUMENT MARKINGS

**Figure 1 – Type II DUAL TORQUE INDICATOR – STANDARD 412 without Mast Torque**



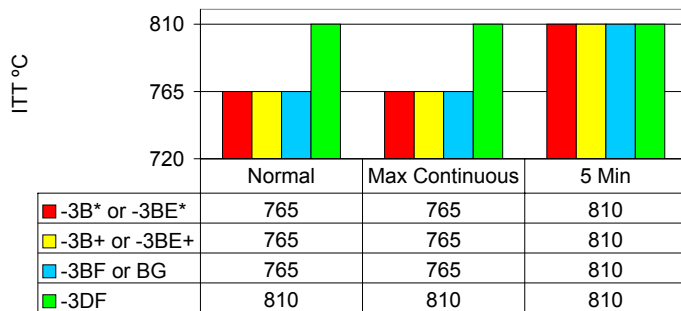
**Figure 2 - TRIPLE TORQUE INDICATOR – Bell 412 with Mast Torque**



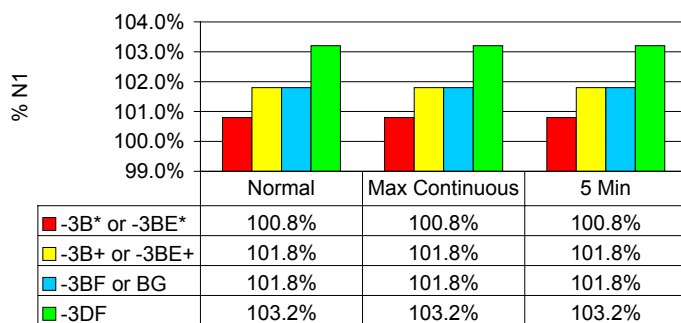
# AIRLINE UPGRADES - BELL 412 COMPARISONS

## Twin Engine

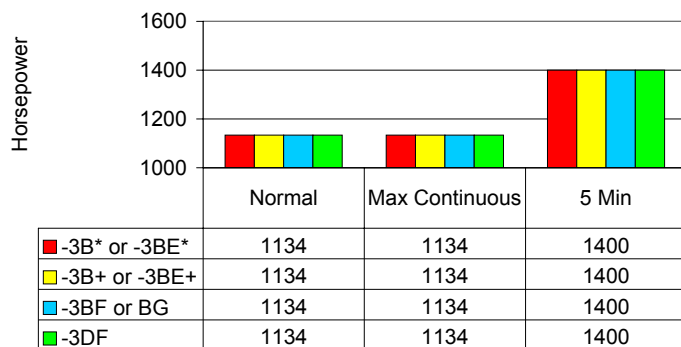
Bell 412 Twin Engine Operation - ITT Limits



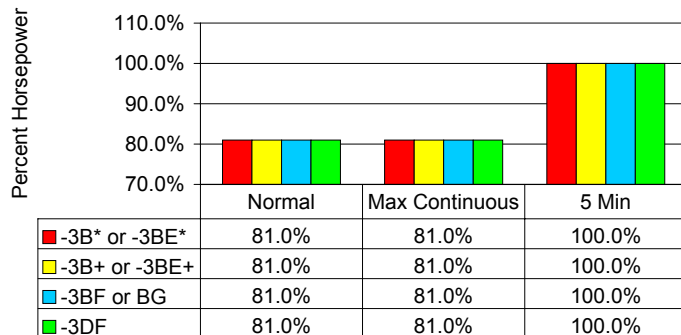
Bell 412 Twin Engine Operation - N1 Limits



Bell 412 Twin Engine Operation - Horsepower Limits

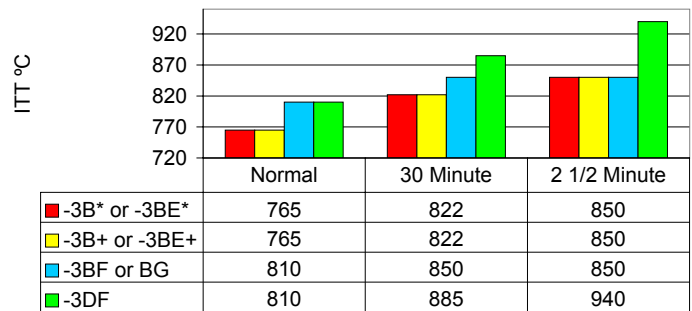


Bell 412 Twin Engine Operation - % Horsepower Limits

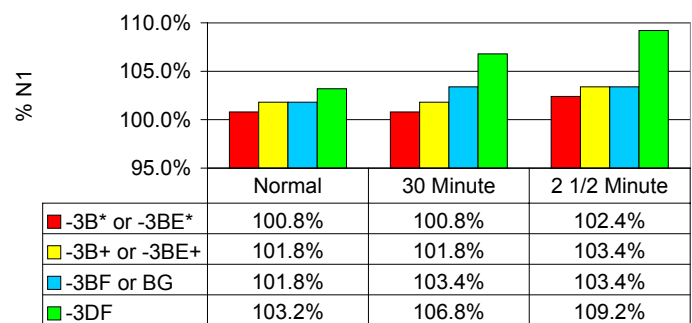


## OEI Operation

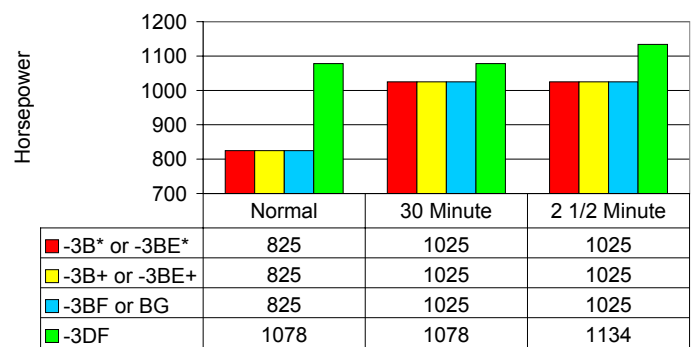
Bell 412 OEI Engine Operation - ITT Limits



Bell 412 OEI Engine Operation - N1 Limits



Bell 412 OEI Operation - Horsepower Limits



Bell 412 OEI Operation - % Horsepower Limits

