

**ALERT SERVICE BULLETIN**  
**Bell Helicopter** **TEXTRON**

A Subsidiary of Textron Inc.

NO. 230-05-33

DATE Jun 10, 2005

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DATE
REV

**MODEL AFFECTED:** 230

**SUBJECT:** NEW TRANSIENT LIMIT AND POWER TURBINE RPM (NP) STEADY STATE OPERATION AVOIDANCE, INTRODUCTION OF

**HELICOPTERS AFFECTED:** All model 230 helicopters

**COMPLIANCE:** In accordance with Rolls-Royce Corporation ALERT Commercial Engine Bulletin CEB A-72-3272 dated June 13, 2005.

**DESCRIPTION:**

As a result of recent third stage turbine wheel investigation, Rolls Royce Corporation have revised the Overspeed Limit Table for all Series IV Engines. The new table includes a Steady State Avoidance Range and adds a new Transient Overspeed Excursion Limit. Recording of Overspeed excursion events above the new Transient Event Limit line and below the Max Transient line is mandated.

With the release of CEB A-72-3272, Rolls Royce has revised the Model 250-C30G/2 Engine Overspeed Limit Table introducing a new Steady State Operation Avoidance Power Turbine RPM (Np) Speed range between 71% and 92%. A decal is added on the instrument panel to ensure crew awareness of this new Np speed restriction.

A Flight Manual revision and an instrument panel decal are required in the accomplishment of this bulletin and are included with the distribution.

**APPROVAL:**

The engineering design aspects of this bulletin are Transport Canada Civil Aviation (TCCA) approved.

**MANPOWER:**

Approximately 0.5 man-hours are required to complete this bulletin. Man-hours are based on hands-on time, and may vary with personnel and facilities available.

**MATERIAL:**

**Required Material:**

The following material is required for the accomplishment of this bulletin and may be obtained through your Bell Helicopter Textron Supply Center.

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>
230-075-213-115	Decal	1

**Consumable Material:**

The following material is required to accomplish this bulletin, but may not require ordering, depending on the operator's consumable material stock levels. This material may be obtained through your Bell Helicopter Textron Supply Center.

<u>Part Number</u>	<u>Nomenclature</u>	<u>Reference</u>
3950 Scotchcal	Sealer	C-349

The "C" REF. NO. above is a cross-reference found in the Standard Practices Manual (BHT-ALL-SPM)

**SPECIAL TOOLS:**

None required

**WEIGHT AND BALANCE:**

Not affected

**ELECTRICAL LOAD DATA:**

Not affected

**REFERENCES:**

BHT-230-FM-1 Flight Manual

BHT-230-MM-2 Chapter 11 Placards and Markings  
BHT-ALL-SPM Chapter 13 – Consumable Materials  
Rolls-Royce Corporation ALERT Commercial Engine Bulletin CEB A-72-3272 dated  
June 13, 2005.

**PUBLICATIONS AFFECTED:**

BHT-230-FM-1 Flight Manual  
BHT-230-MM-2 Chapter 11 Placards and Markings

**ACCOMPLISHMENT INSTRUCTIONS:**

1. Comply with Rolls-Royce Corporation ALERT Commercial Engine Bulletin CEB A-72-3272 dated June 13, 2005.
2. Following instructions in BHT-230-MM-2, Chapter 11, install decal 230-075-213-115, as shown in Figure1, on the instrument panel. Refer to Figure 2 for location.
3. Insert the new Flight Manual revision 5 dated May 6, 2005 into BHT-230-FM-1.
4. Annotate the aircraft technical records to indicate that this bulletin is completed.

AVOID STEADY STATE  
OPERATION BETWEEN  
71 & 92% (Np)

Figure 1 – Decal p/n 230-075-213-115

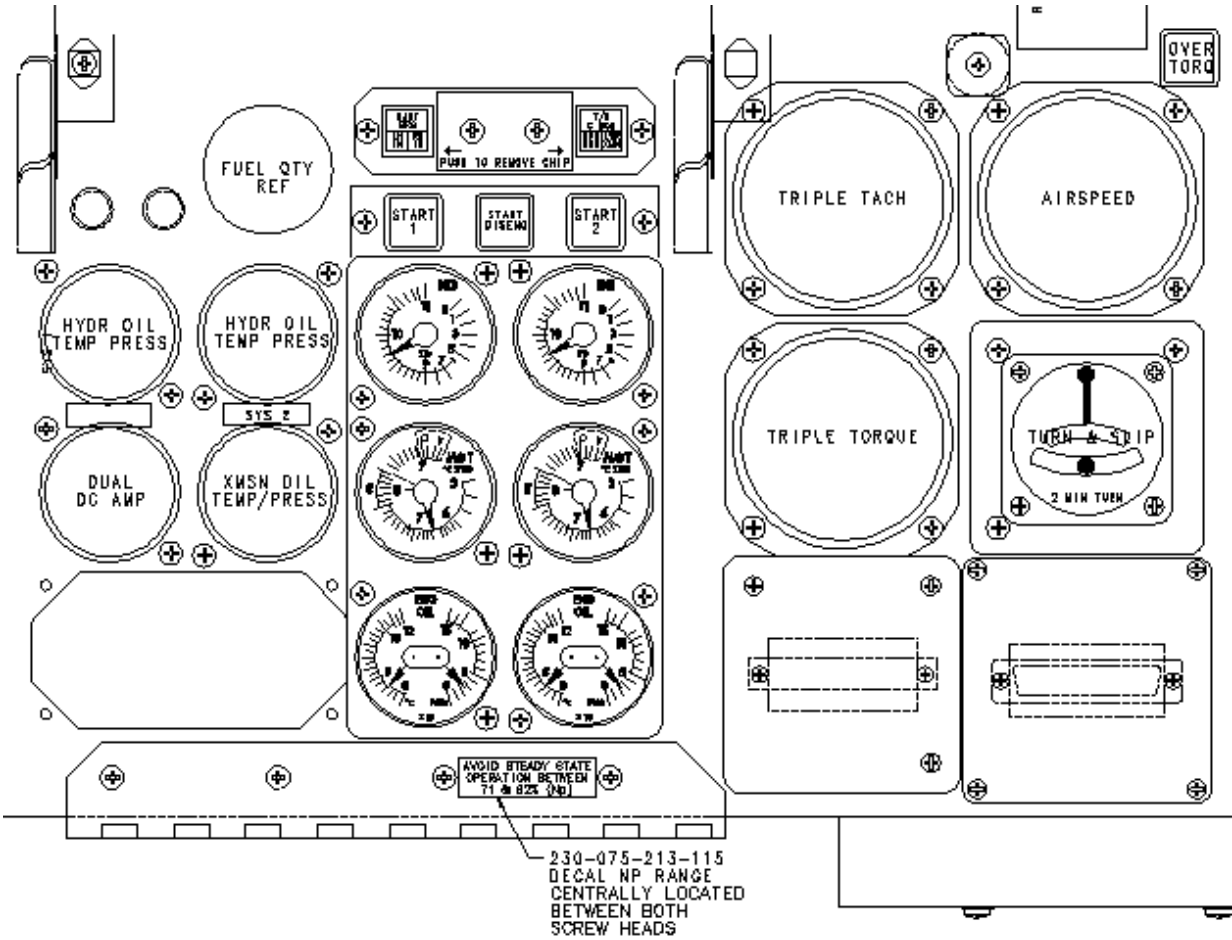


Figure 2 – Instrument panel

### ENGINE, TURBINE ASSEMBLY - NEW THRESHOLD EVENT RECORDING AND NEW STEADY-STATE OPERATION AVOIDANCE RANGE LIMIT

#### 1. PLANNING INFORMATION

##### A. Effectivity

###### (1) Engines

All Rolls-Royce Model 250-C30, -C40 and C47 Series engines are affected by this bulletin.

###### (2) Spares - affected

**NOTE:** All spares should include Threshold Event Excursion records. All spare wheels at the time of publication of this CEB should be properly tagged as zero Threshold Event Excursions unless otherwise specified by Rolls-Royce. All wheels must be accompanied by a Life Limited Part Log Card.

##### B. Reason

Rolls-Royce has revised the Overspeed Limit Table for all Series IV engines. The new tables are revised to include the Steady State Avoid Range and new transient Event Thresholds, including event threshold exceedance recording requirements. These revised limits result from the recent third stage turbine wheel investigations.

##### C. Description

Operators are now required to record power turbine speed event threshold exceedances in the engine log records using newly created Life Limited Part Log Cards. This new range is specified by engine type in the following wording and attached charts. Rolls-Royce has also revised the Np/N2 steady-state operation avoidance range. The new steady-state operation avoidance range has an increased upper limit of approximately one percent power turbine speed (1% Np/N2) for all Rolls-Royce Model 250 Series IV Engines.

To provide consistency between all Series IV engine models, Rolls-Royce has converted to a common format between Series IV Engine Overspeed Limit Tables. Np / N2 Overspeed Limits are no longer dependent upon torque, only on N2 speed.

##### D. Approval

Technical aspects are FAA approved.

##### E. Compliance

Compliance Code 2. To be complied with within the next five hours or no later than June 10, 2005.

**NOTE:** For FADEC equipped engines, all ECU NpQ parameters should be cleared before complying with the event threshold exceedance recording required by this CEB. Reference 2.A.(4). Past exceedances shall not be considered unless otherwise specified by Rolls-Royce.

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250-C30 Series  
250-C40 Series  
250-C47 Series

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### COMMERCIAL ENGINE BULLETIN

F. Interchangeability - Not affected

G. Material Availability

P/N	NAME	QTY/ENG
6898663	Turbine Wheel, Third-Stage	1
23065843	Turbine Wheel, Third-Stage	1
6892764	Turbine Wheel, Fourth-Stage	1
23066744	Turbine Wheel, Fourth-Stage	1

H. Tooling - Not applicable

I. Weight and Balance - Not affected

J. Electrical Load Data - Not affected

K. References

- (1) 14W2 Operation and Maintenance Manual, Turboshaft Models 250-C30, -C30S, -C30G, -C30G/2, -C30P, -C30M (OMM).
- (2) 14W4 Illustrated Parts Catalog, Turboshaft Models 250-C30, -C30P, -C30M, -C30S, -C30G, -C30G/2 (IPC).
- (3) 14W4R, U Illustrated Parts Catalog, Turboshaft Models 250-C30R, -C30U (IPC).
- (4) 14W2RU Operation and Maintenance Manual, Turboshaft Models 250-C30R, -C30U (OMM).
- (5) CSP 21003 Operation and Maintenance Manual, Turboshaft Model 250-C30R/3 (OMM).
- (6) CSP 23003 Illustrated Parts Catalog, Turboshaft Model 250-C30R/3, -C30R/3M (IPC).
- (7) CSP 21006 Operation and Maintenance Manual, Turboshaft Model 250-C30R/3M (OMM).
- (8) CSP 21000 Operation and Maintenance Manual, Turboshaft Model 250-C40B (OMM).
- (9) CSP 21001 Operation and Maintenance Manual, Turboshaft Model 250-C47B (OMM).
- (10) CSP 23001 Illustrated Parts Catalog, Turboshaft Models 250-C40B, -C47B and C47M (IPC).
- (11) CSP 21004 Operation and Maintenance Manual, Turboshaft Model 250-C47M (OMM).

L. Other Publications Affected - Life Limited Part Log Card (GT12017).

Life Limited Part Log Card has been created for this recording purpose. Cards may be ordered from AVIALL.

M. Prerequisites - None

## 2. ACCOMPLISHMENT INSTRUCTIONS

A. All Rolls-Royce Model 250 Series IV Engines (REF. Fig. 1, 2, 3, 4 and 5).

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250-C40 Series  
250-C47 Series

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**NOTE:** Inspection of turbine wheels does not clear recorded event threshold exceedances. The events recorded against each affected turbine wheel shall remain as a life limiting recorded item for that affected turbine wheel until the wheel reaches the first of its allowable hour, cycle, or event limits.

- (1) Transient overspeed excursions between the Max. Continuous line and the Max. Overspeed Transient line, which exceed 15 seconds require specific action as described in this CEB. Any excursion greater than 15 seconds requires power turbine wheel inspection.
- (2) The transient overspeed range is now divided into two sections. Any transient overspeed excursion above the Max. Continuous line and below the new Event Threshold line does not require maintenance action provided the single event is less than 15 seconds.
- (3) Any transient overspeed excursion above the new Event Threshold line and below the Max. Overspeed Transient line does not require maintenance action provided the single event is less than 15 seconds; however, the excursion shall be recorded as an event. No more than five events are allowed in this new range.
  - (a) Maintain Engine Log Book Records so that transient N2 speed excursion events into the new range between 34,532 RPM (112.7% for the C30, C30G, C30M, C30P, C30R, C30R/1, C30R/3, C30R/3M, C30S, C30U and C47M; 112.4% for the C30G/2; 107.3% for the C47B; and 111.7% for the C40B) and 36,474 RPM (119.0% for the C30, C30G, C30M, C30P, C30R, C30R/1, C30R/3, C30R/3M, C30S, C30U, and C47M; 118.7% for the C30G/2; 113.3% for the C47B; and 118.0% for the C40B) are recorded. Record the maximum speed exceedance value and the date in the Life Limited Part Log Card.
  - (b) Only five total events are allowed into this range. The sixth event into this range requires removal and replacement of the power turbine wheels.

**NOTE:** For FADEC engine models (250-C30R/3, -C30R/3M, -C40B, -C47B, -C47M), the current version of FADEC software may not identify all recordable exceedances. Operators shall manually monitor and record threshold event exceedances as described.

**NOTE:** For FADEC equipped engines, all ECU NpQ parameters should be cleared before complying with the event threshold exceedance recording required by this CEB. Reference 2.A.(4). Past exceedances shall not be considered unless otherwise specified by Rolls-Royce.

- (4) All FADEC engines (250-C30R/3, -C30R/3M, -C40B, -C47B, -C47M) should have their NpQ parameters cleared prior to complying with the event threshold exceedance recording. This history clearance will verify that the event threshold exceedances are correctly counted from the point of CEB compliance forward.
  - (a) Connect to the ECU through Maintenance Terminal Software.
  - (b) Select "EDIT" from the "Engine History" menu.
  - (c) Click to highlight "NpQNppkExLm".
  - (d) Click the clear box.
  - (e) Click to highlight "NpQQpkExLm".
  - (f) Click the clear box.
- (5) Any FADEC engine (250-C30R/3, -C30R/3M, -C40B, -C47B, -C47M) that has experienced an event threshold exceedance should have the NpQ parameters cleared after recording the event in the Life Limited Part Log Card. (Reference above procedure 2.A.(4)).

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250-C30 Series  
250-C40 Series  
250-C47 Series

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B. Record events in the Engine Log Book, Life Limited Part Log Card, as applicable.

250-C30 Series

250-C40 Series

250-C47 Series

3. MATERIAL INFORMATION - Not applicable

CUSTOMER SUPPORT  
ROLLS-ROYCE

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250-C30 Series  
250-C40 Series  
250-C47 Series

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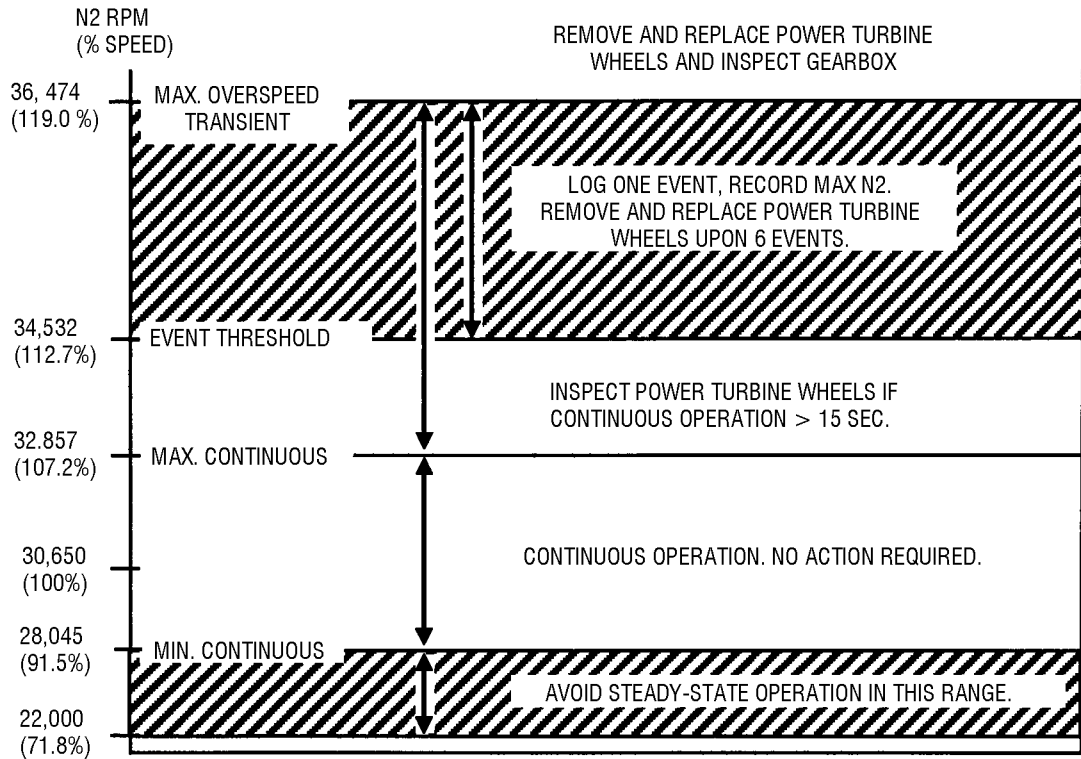
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### COMMERCIAL ENGINE BULLETIN

250-C30, -C30G, -C30M, -C30P, -C30S, -C47M

#### SERIES IV ENGINES - POWER TURBINE SPEED LIMITS & MAINTENANCE ACTIONS



**NOTE:**

N2 SPEED RESTRICTIONS ARE DEFINED BY N2 RPM.  
(% SPEED PRESENTED FOR REFERENCE ONLY.)

NOT TO SCALE

APS191XA

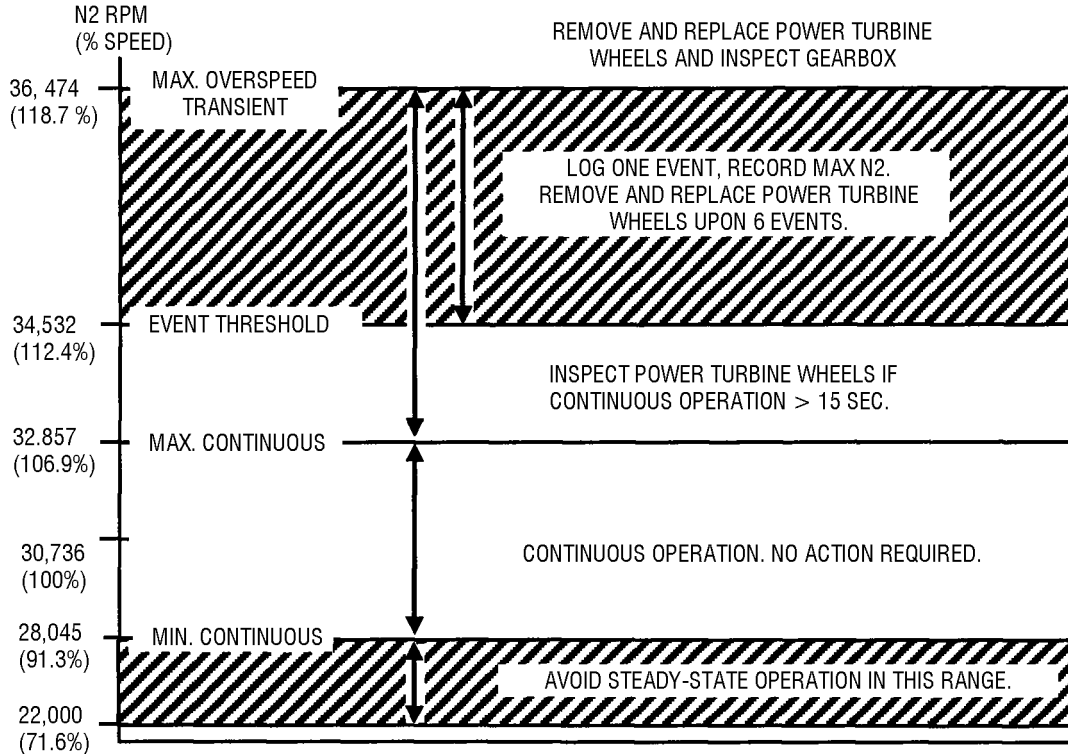
Power Turbine Speed Restrictions  
FIG. 1

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COMMERCIAL ENGINE BULLETIN

250-C30G/2

## SERIES IV ENGINES - POWER TURBINE SPEED LIMITS & MAINTENANCE ACTIONS



**NOTE:**

N2 SPEED RESTRICTIONS ARE DEFINED BY N2 RPM.  
(% SPEED PRESENTED FOR REFERENCE ONLY.)

NOT TO SCALE

APS192XA

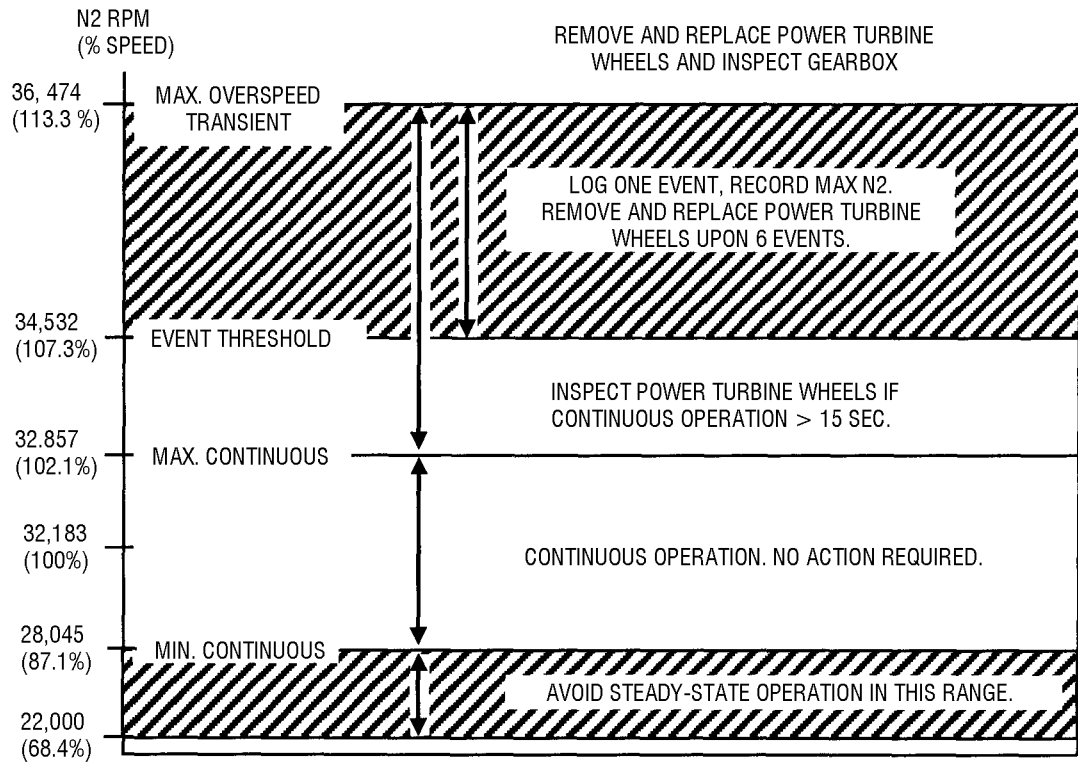
Power Turbine Speed Restrictions  
FIG. 2

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250-C47B

## SERIES IV ENGINES - POWER TURBINE SPEED LIMITS & MAINTENANCE ACTIONS



**NOTE:**

N2 SPEED RESTRICTIONS ARE DEFINED BY N2 RPM.  
(% SPEED PRESENTED FOR REFERENCE ONLY.)

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Power Turbine Speed Restrictions  
FIG. 3

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250-C30 Series  
250-C40 Series  
250-C47 Series

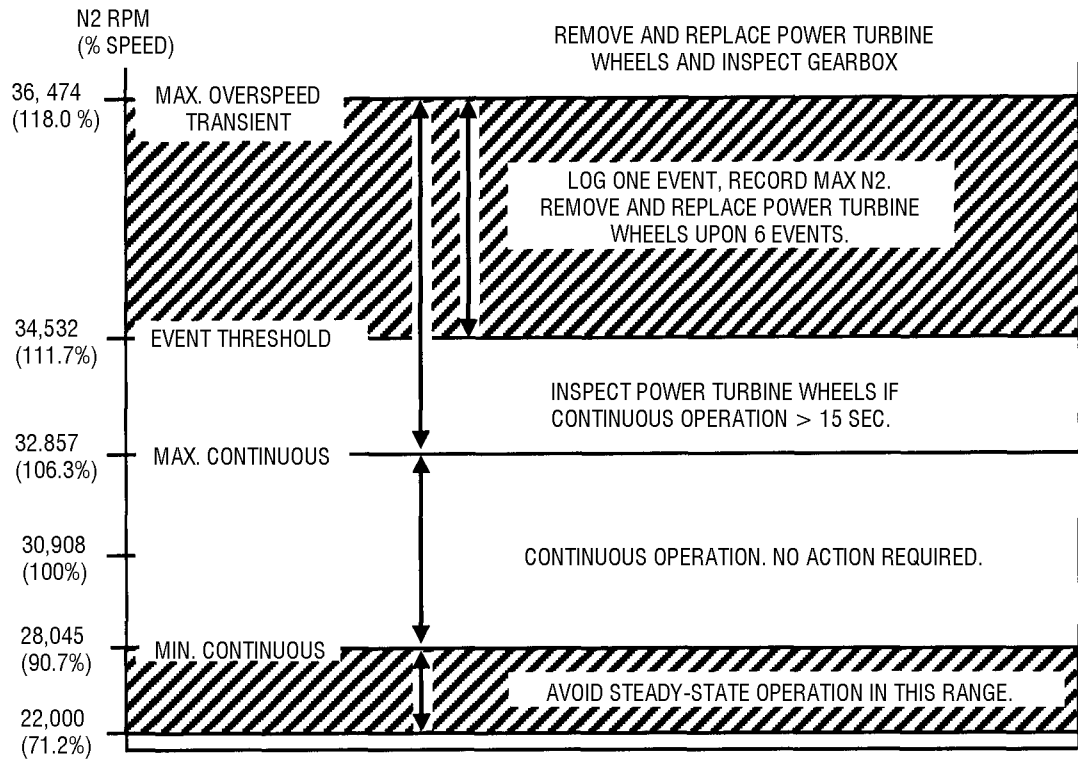
CEB A-72-3272  
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## 250-C40B

### SERIES IV ENGINES - POWER TURBINE SPEED LIMITS & MAINTENANCE ACTIONS



**NOTE:**

N2 SPEED RESTRICTIONS ARE DEFINED BY N2 RPM.  
(% SPEED PRESENTED FOR REFERENCE ONLY.)

NOT TO SCALE

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Power Turbine Speed Restrictions  
FIG. 4

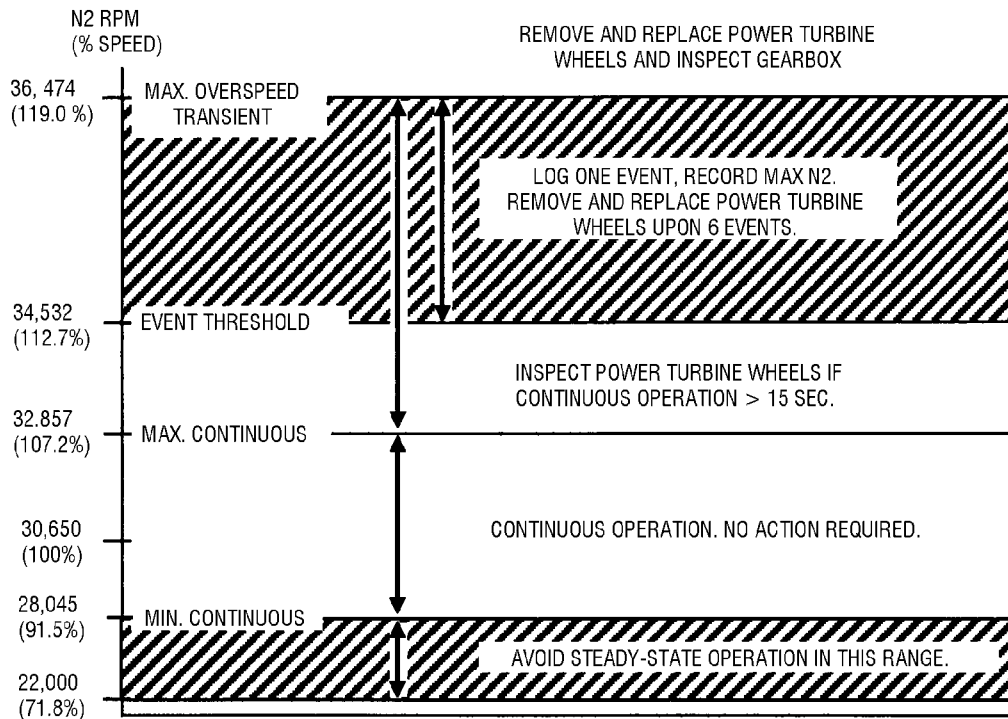
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### COMMERCIAL ENGINE BULLETIN

250-C30R, -C30R/1, -C30R/3, -C30R/3M, -C30U

#### SERIES IV ENGINES - POWER TURBINE SPEED LIMITS & MAINTENANCE ACTIONS



**NOTE:**

N2 SPEED RESTRICTIONS ARE DEFINED BY N2 RPM.  
(% SPEED PRESENTED FOR REFERENCE ONLY.)

NOT TO SCALE

APS195XA

Power Turbine Speed Restrictions  
FIG. 5