

Comparing methods of measurement: why plotting difference against standard method is misleading

J Martin Bland, Douglas G Altman

Summary

When comparing a new method of measurement with a standard method, one of the things we want to know is whether the difference between the measurements by the two methods is related to the magnitude of the measurement. A plot of the difference against the standard measurement is sometimes suggested, but this will always appear to show a relation between difference and magnitude when there is none. A plot of the difference against the average of the standard and new measurements is unlikely to be misled in this way. We show this theoretically and by a practical example.

Lancet 1995; **346**: 1085-87

Introduction

In earlier papers^{1,2} we discussed the analysis of agreement between methods of clinical measurement. We had two issues in mind: to demonstrate that the analyses then in use were incorrect and misleading, and to recommend a more appropriate method. We saw the aim of such studies as to determine whether two methods agreed sufficiently well for them to be used interchangeably. This led us to suggest that the analysis should be based on the differences between measurements on the same subject by the two methods. The mean difference would be the estimated bias, the systematic difference between methods, and the SD of the differences would measure random fluctuations around this mean. We recommended 95% limits of agreement, mean difference plus or minus 2 (more precisely, 1.96) SDs which would tell us how far apart measurements by the two methods were likely to be for most individuals.

Figure 1 shows a typical data set, the measurement of systolic blood pressure by a test method, finger pressure, and a standard method, arm blood pressure. This is a random subsample of 200 observations from a larger data set.^{1,2} The subsample was taken to avoid cluttered graphs. The mean difference, finger minus arm, is 4.3 mm Hg and the SD is 14.6. Hence the lower 95% limit is $4.3 - 1.96 \times 14.6 = -24$ mm Hg and the upper 95% limit is $4.3 + 1.96 \times 14.6 = 33$ mm Hg. Thus we estimate that for 95% of subjects the finger measurement will be between 24 mm Hg below the arm measurement and 33 mm Hg above it.

For the mean and SD of the differences to be meaningful estimates we must assume that they are reasonably constant throughout the range of measurement. We suggested checking this assumption graphically.^{1,2} The usual plot, method one versus method two, is inefficient because the points tend to be clustered

along the line of equality (figure 1), especially if the two methods give closely related measurements. We therefore proposed that the difference be plotted against the average of the measurements by the two methods (figure 2). In figure 2 we have also added the 95% limits of agreement and the regression line of difference on average. The main departure from assumptions we were expecting was an increase in variability, shown by an increase in the scatter of the differences, as the magnitude of the measurement increased. There may also be a trend in the bias, a tendency for the mean difference to rise or fall with increasing magnitude. Either would show that the methods did not agree equally through the range. In figure 2, for example, there is an increase in bias with magnitude, shown by the positive slope of the regression line. Such deviations from assumptions can often be dealt with by a suitable transformation, usually logarithmic.³ In particular, this approach will be effective if the differences are proportional to the magnitude of the measurement.

The 95% limits of agreement approach has been widely adopted and *The Lancet* paper¹ widely cited.⁴ However, it is sometimes argued that when one method may be regarded as a gold standard, it is presumably more accurate than the other method and so we should plot the difference against the gold standard.^{5,6} We think that this idea is misguided and is likely to lead to misinterpretation. Here we will show why, and that the plot of difference against average is almost always preferable.

Plotting difference against average

We denote our standard measurement by S , the new or test measurement by T , their variances by σ_S^2 and σ_T^2 , and their correlation by ρ . If the study includes a wide range of measurements, and unless the two methods of



Figure 1: Test and standard measurements, with line of equality

Department of Public Health Sciences, St George's Hospital Medical School, London SW17 0RE, UK (J M Bland *mc*); and Medical Statistics Laboratory, Imperial Cancer Research Fund, London WC2 (D G Altman *mc*).

Correspondence to: Dr J Martin Bland.

Comparing Methods Of Measurement Why Plotting Difference

Ying-Ying Zheng



Comparing Methods Of Measurement Why Plotting Difference:

Comparing Clinical Measurement Methods Bendix Carstensen, 2011-06-24 This book provides a practical guide to analysis of simple and complex method comparison data using Stata SAS and R It takes the classical Limits of Agreement as a starting point and presents it in a proper statistical framework The model serves as a reference for reporting sources of variation and for providing conversion equations and plots between methods for practical use including prediction uncertainty Presents a modeling framework for analysis of data and reporting of results from comparing measurements from different clinical centers and or different methods Provides the practical tools for analyzing method comparison studies along with guidance on what to report and how to plan comparison studies and advice on appropriate software Illustrated throughout with computer examples in R Supported by a supplementary website hosting an R package that performs the major part of the analyses needed in the area Examples in SAS and Stata for the most common situations are also provided Written by an acknowledged expert on the subject with a long standing experience as a biostatistician in a clinical environment and a track record of delivering training on the subject Biostatisticians clinicians medical researchers and practitioners involved in research and analysis of measurement methods and laboratory investigations will benefit from this book Students of statistics biostatistics and the chemical sciences will also find this book useful *Tietz Textbook of Laboratory Medicine - E-Book* Nader Rifai, 2022-02-03 Use THE definitive reference for laboratory medicine and clinical pathology Tietz Textbook of Laboratory Medicine 7th Edition provides the guidance necessary to select perform and evaluate the results of new and established laboratory tests Comprehensive coverage includes the latest advances in topics such as clinical chemistry genetic metabolic disorders molecular diagnostics hematology and coagulation clinical microbiology transfusion medicine and clinical immunology From a team of expert contributors led by Nader Rifai this reference includes access to wide ranging online resources on Expert Consult featuring the comprehensive product with fully searchable text regular content updates animations podcasts over 1300 clinical case studies lecture series and more Authoritative current content helps you perform tests in a cost effective timely and efficient manner provides expertise in managing clinical laboratory needs and shows how to be responsive to an ever changing environment Current guidelines help you select perform and evaluate the results of new and established laboratory tests Expert internationally recognized chapter authors present guidelines representing different practices and points of view Analytical criteria focus on the medical usefulness of laboratory procedures Use of standard and international units of measure makes this text appropriate for any user anywhere in the world Elsevier eBooks provides the entire text as a fully searchable eBook and includes animations podcasts more than 1300 clinical case studies over 2500 multiple choice questions a lecture series and more all included with print purchase NEW 19 additional chapters highlight various specialties throughout laboratory medicine NEW Updated peer reviewed content provides the most current information possible NEW The largest ever compilation of clinical cases in laboratory

medicine is included with print purchase on Elsevier eBooks NEW Over 100 adaptive learning courses included with print purchase on Elsevier eBooks offer the opportunity for personalized education **Tietz Textbook of Clinical Chemistry and Molecular Diagnostics - E-Book** Nader Rifai,2017-01-16 The Tietz Textbook of Clinical Chemistry and Molecular Diagnostics 6th Edition provides the most current and authoritative guidance on selecting performing and evaluating the results of new and established laboratory tests This classic clinical chemistry reference offers encyclopedic coverage detailing everything you need to know including analytical criteria for the medical usefulness of laboratory tests variables that affect tests and results laboratory medicine applications of statistical methods and most importantly clinical utility and interpretation of laboratory tests It is THE definitive reference in clinical chemistry and molecular diagnostics now fully searchable and with quarterly content updates podcasts clinical cases animations and extended content online through Expert Consult Analytical criteria focus on the medical usefulness of laboratory procedures Reference ranges show new approaches for establishing these ranges and provide the latest information on this topic Lab management and costs gives students and chemists the practical information they need to assess costs allowing them to do their job more efficiently and effectively Statistical methods coverage provides you with information critical to the practice of clinical chemistry Internationally recognized chapter authors are considered among the best in their field Two color design highlights important features illustrations and content to help you find information easier and faster NEW Internationally recognized chapter authors are considered among the best in their field NEW Expert Consult features fully searchable text quarterly content updates clinical case studies animations podcasts atlases biochemical calculations multiple choice questions links to Medline an image collection and audio interviews You will now enjoy an online version making utility of this book even greater UPDATED Expanded Molecular Diagnostics section with 12 chapters that focus on emerging issues and techniques in the rapidly evolving and important field of molecular diagnostics and genetics ensures this text is on the cutting edge and of the most value NEW Comprehensive list of Reference Intervals for children and adults with graphic displays developed using contemporary instrumentation NEW Standard and international units of measure make this text appropriate for any user anywhere in the world NEW 22 new chapters that focus on applications of mass spectrometry hematology transfusion medicine microbiology biobanking biomarker utility in the pharmaceutical industry and more NEW Expert senior editors Nader Rifai Carl Wittwer and Rita Horvath bring fresh perspectives and help ensure the most current information is presented UPDATED Thoroughly revised and peer reviewed chapters provide you with the most current information possible

Quantitative Gas Chromatography-Mass Spectrometry in the Life Sciences Dimitrios Tsikas,2025-12-01 *Quantitative Gas Chromatography Mass Spectrometry Principles in Life Sciences and Biochemical Applications* provides an in depth exploration of the principles and practices of GC MS This comprehensive guide caters to researchers academics and graduate students engaged in analytical chemistry offering both theoretical knowledge and practical applications The book is

structured to introduce the fundamentals before delving into advanced techniques ensuring a thorough understanding for all readers The book covers essential topics such as gas chromatography tandem mass spectrometry liquid chromatography tandem mass spectrometry and the use of stable isotopes and labeled analogs It also presents practical advice on method development validation and quality control Additionally it addresses common issues and troubleshooting in GC MS making it a valuable resource for those in fields like Biochemistry Pharmacology Forensic Medicine and Metabolomics Features structured a learning pathway starting with basic principles and progressing to more complex topics Delves into advances and applications in the analysis of biological samples with uses in fields such as Biochemistry Analytical Biochemistry Mass Spectrometry Pharmacology Forensic Medicine Metabolomics Life Sciences Pediatrics and Laboratory Medicine Addresses the whole analytical process comprehensibly from a practical point of view describing potential analytical challenges and provides possible solutions to overcome shortcomings and to avoid pitfalls *Oxford Handbook of Medical Statistics* Janet Peacock, Philip Peacock, 2011 The majority of medical research involves quantitative methods and so it is essential to be able to understand and interpret statistics This book shows readers how to develop the skills required to critically appraise research evidence effectively and how to conduct research and communicate their findings *Oxford Handbook of Medical Statistics* Janet L. Peacock, Phil J. Peacock, 2020-06-11 A good understanding of medical statistics is essential to evaluate medical research and to choose appropriate ways of implementing findings in clinical practice The Oxford Handbook of Medical Statistics has been written to provide doctors and medical students with a comprehensive yet concise account of this often difficult subject Described by readers as a statistical Bible this new edition maintains the accessibility and thoroughness of the original and includes comprehensive updates including new sections on transitional medicine cluster designs and modern statistical packages The Handbook promotes understanding and interpretation of statistical methods across a wide range of topics from study design and sample size considerations through t and chi squared tests to complex multifactorial analyses all using examples from published research References and further reading are included to allow deeper understanding on specific topics Featuring a new chapter on how to use this book in different medical contexts the Oxford Handbook of Medical Statistics helps readers to conduct their own research and critically appraise others work

Evidence-Based Diagnosis Thomas B. Newman, Michael A. Kohn, 2020-06-25 Medicine is becoming increasingly reliant on diagnostic prognostic and screening tests for the successful treatment of patients With new tests being developed all the time a more informed understanding of the benefits and drawbacks of these tests is crucial Providing readers with the tools needed to evaluate and interpret these tests numerous real world examples demonstrate the practical application and relevance of the material The mathematics involved are rigorously explained using simple and informative language Topics covered include the diagnostic process reliability and accuracy of tests and quantifying treatment benefits using randomized trials amongst others Engaging illustrations act as visual representations of the concepts discussed in the book

complementing the textual explanation Based on decades of experience teaching in a clinical research training program this fully updated second edition is an essential guide for anyone looking to select develop or market medical tests

Comparing Methods of Measurement with Analysis of Covariance and Mean Structures Erkki Alanen,1996
Yhteenveto **A Manual of Physical Measurements** Anthony Zeleny, Henry Anton Erikson,1919 A Comparison of
Tillage and Sod Mulch in an Apple Orchard U. P. Hedrick,1909 **Comparison of Methods for Estimating Forest**
Overstory Cover David Joseph Vales,1985 **A Comparison of Several of the Growth Percent Methods of Predicting**
Growth Paul Otto Rudolf,1929 Bombay University Calendar: Calendar University of Bombay,1924 **The Bombay**
University Calendar University of Bombay,1924 **Bombay University Handbook** University of Bombay,1922
Clarkson Bulletin Clarkson College of Technology,1908 *Catalogue* Columbia University,1898 **The Scientific**
Principles of Plant Protection Hubert Martin,1928 **Carnegie Institution of Washington Publication** ,1911 **The**
Journal of Rheumatology ,2004

Getting the books **Comparing Methods Of Measurement Why Plotting Difference** now is not type of inspiring means. You could not deserted going later than books accretion or library or borrowing from your friends to entre them. This is an enormously simple means to specifically get guide by on-line. This online pronouncement Comparing Methods Of Measurement Why Plotting Difference can be one of the options to accompany you next having supplementary time.

It will not waste your time. undertake me, the e-book will certainly space you further business to read. Just invest tiny times to right of entry this on-line declaration **Comparing Methods Of Measurement Why Plotting Difference** as skillfully as review them wherever you are now.

<https://py.bijouxmedusa.com/About/virtual-library/index.jsp/International%20Economics%20Feenstra%20And%20Taylor%202nd%20Edition.pdf>

Table of Contents Comparing Methods Of Measurement Why Plotting Difference

1. Understanding the eBook Comparing Methods Of Measurement Why Plotting Difference
 - The Rise of Digital Reading Comparing Methods Of Measurement Why Plotting Difference
 - Advantages of eBooks Over Traditional Books
2. Identifying Comparing Methods Of Measurement Why Plotting Difference
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Comparing Methods Of Measurement Why Plotting Difference
 - User-Friendly Interface
4. Exploring eBook Recommendations from Comparing Methods Of Measurement Why Plotting Difference
 - Personalized Recommendations
 - Comparing Methods Of Measurement Why Plotting Difference User Reviews and Ratings

- Comparing Methods Of Measurement Why Plotting Difference and Bestseller Lists
- 5. Accessing Comparing Methods Of Measurement Why Plotting Difference Free and Paid eBooks
 - Comparing Methods Of Measurement Why Plotting Difference Public Domain eBooks
 - Comparing Methods Of Measurement Why Plotting Difference eBook Subscription Services
 - Comparing Methods Of Measurement Why Plotting Difference Budget-Friendly Options
- 6. Navigating Comparing Methods Of Measurement Why Plotting Difference eBook Formats
 - ePub, PDF, MOBI, and More
 - Comparing Methods Of Measurement Why Plotting Difference Compatibility with Devices
 - Comparing Methods Of Measurement Why Plotting Difference Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Comparing Methods Of Measurement Why Plotting Difference
 - Highlighting and Note-Taking Comparing Methods Of Measurement Why Plotting Difference
 - Interactive Elements Comparing Methods Of Measurement Why Plotting Difference
- 8. Staying Engaged with Comparing Methods Of Measurement Why Plotting Difference
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Comparing Methods Of Measurement Why Plotting Difference
- 9. Balancing eBooks and Physical Books Comparing Methods Of Measurement Why Plotting Difference
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Comparing Methods Of Measurement Why Plotting Difference
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Comparing Methods Of Measurement Why Plotting Difference
 - Setting Reading Goals Comparing Methods Of Measurement Why Plotting Difference
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Comparing Methods Of Measurement Why Plotting Difference
 - Fact-Checking eBook Content of Comparing Methods Of Measurement Why Plotting Difference
 - Distinguishing Credible Sources

13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
 - Integration of Multimedia Elements
 - Interactive and Gamified eBooks

Comparing Methods Of Measurement Why Plotting Difference Introduction

In this digital age, the convenience of accessing information at our fingertips has become a necessity. Whether its research papers, eBooks, or user manuals, PDF files have become the preferred format for sharing and reading documents. However, the cost associated with purchasing PDF files can sometimes be a barrier for many individuals and organizations. Thankfully, there are numerous websites and platforms that allow users to download free PDF files legally. In this article, we will explore some of the best platforms to download free PDFs. One of the most popular platforms to download free PDF files is Project Gutenberg. This online library offers over 60,000 free eBooks that are in the public domain. From classic literature to historical documents, Project Gutenberg provides a wide range of PDF files that can be downloaded and enjoyed on various devices. The website is user-friendly and allows users to search for specific titles or browse through different categories. Another reliable platform for downloading Comparing Methods Of Measurement Why Plotting Difference free PDF files is Open Library. With its vast collection of over 1 million eBooks, Open Library has something for every reader. The website offers a seamless experience by providing options to borrow or download PDF files. Users simply need to create a free account to access this treasure trove of knowledge. Open Library also allows users to contribute by uploading and sharing their own PDF files, making it a collaborative platform for book enthusiasts. For those interested in academic resources, there are websites dedicated to providing free PDFs of research papers and scientific articles. One such website is Academia.edu, which allows researchers and scholars to share their work with a global audience. Users can download PDF files of research papers, theses, and dissertations covering a wide range of subjects. Academia.edu also provides a platform for discussions and networking within the academic community. When it comes to downloading Comparing Methods Of Measurement Why Plotting Difference free PDF files of magazines, brochures, and catalogs, Issuu is a popular choice. This digital publishing platform hosts a vast collection of publications from around the world. Users can search for specific titles or explore various categories and genres. Issuu offers a seamless reading experience with its user-friendly interface and allows users to download PDF files for offline reading. Apart from dedicated platforms, search engines also play a crucial role in finding free PDF files. Google, for instance, has an advanced search feature that allows users to filter results by file type.

By specifying the file type as "PDF," users can find websites that offer free PDF downloads on a specific topic. While downloading Comparing Methods Of Measurement Why Plotting Difference free PDF files is convenient, its important to note that copyright laws must be respected. Always ensure that the PDF files you download are legally available for free. Many authors and publishers voluntarily provide free PDF versions of their work, but its essential to be cautious and verify the authenticity of the source before downloading Comparing Methods Of Measurement Why Plotting Difference. In conclusion, the internet offers numerous platforms and websites that allow users to download free PDF files legally. Whether its classic literature, research papers, or magazines, there is something for everyone. The platforms mentioned in this article, such as Project Gutenberg, Open Library, Academia.edu, and Issuu, provide access to a vast collection of PDF files. However, users should always be cautious and verify the legality of the source before downloading Comparing Methods Of Measurement Why Plotting Difference any PDF files. With these platforms, the world of PDF downloads is just a click away.

FAQs About Comparing Methods Of Measurement Why Plotting Difference Books

What is a Comparing Methods Of Measurement Why Plotting Difference PDF? A PDF (Portable Document Format) is a file format developed by Adobe that preserves the layout and formatting of a document, regardless of the software, hardware, or operating system used to view or print it. **How do I create a Comparing Methods Of Measurement Why Plotting Difference PDF?** There are several ways to create a PDF: Use software like Adobe Acrobat, Microsoft Word, or Google Docs, which often have built-in PDF creation tools. Print to PDF: Many applications and operating systems have a "Print to PDF" option that allows you to save a document as a PDF file instead of printing it on paper. Online converters: There are various online tools that can convert different file types to PDF. **How do I edit a Comparing Methods Of Measurement Why Plotting Difference PDF?** Editing a PDF can be done with software like Adobe Acrobat, which allows direct editing of text, images, and other elements within the PDF. Some free tools, like PDFescape or Smallpdf, also offer basic editing capabilities. **How do I convert a Comparing Methods Of Measurement Why Plotting Difference PDF to another file format?** There are multiple ways to convert a PDF to another format: Use online converters like Smallpdf, Zamzar, or Adobe Acrobats export feature to convert PDFs to formats like Word, Excel, JPEG, etc. Software like Adobe Acrobat, Microsoft Word, or other PDF editors may have options to export or save PDFs in different formats. **How do I password-protect a Comparing Methods Of Measurement Why Plotting Difference PDF?** Most PDF editing software allows you to add password protection. In Adobe Acrobat, for instance, you can go to "File" -> "Properties" -> "Security" to set a password to restrict access or editing capabilities. Are there any free alternatives to Adobe Acrobat for working with PDFs? Yes, there are many free alternatives for working with PDFs, such as: LibreOffice: Offers PDF editing features.

PDFsam: Allows splitting, merging, and editing PDFs. Foxit Reader: Provides basic PDF viewing and editing capabilities. How do I compress a PDF file? You can use online tools like Smallpdf, ILovePDF, or desktop software like Adobe Acrobat to compress PDF files without significant quality loss. Compression reduces the file size, making it easier to share and download. Can I fill out forms in a PDF file? Yes, most PDF viewers/editors like Adobe Acrobat, Preview (on Mac), or various online tools allow you to fill out forms in PDF files by selecting text fields and entering information. Are there any restrictions when working with PDFs? Some PDFs might have restrictions set by their creator, such as password protection, editing restrictions, or print restrictions. Breaking these restrictions might require specific software or tools, which may or may not be legal depending on the circumstances and local laws.

Find Comparing Methods Of Measurement Why Plotting Difference :

[international economics feenstra and taylor 2nd edition](#)

[international business 3rd edition dlabay and scott](#)

[intrinsic the yara silva trilogy 1 lani woodland](#)

[intermediate algebra for college students by allen r angel](#)

[industrial engineering and production management by mahajan](#)

[interior colour schemes to inspire the interior designer](#)

[intermediate accounting exam 1 solutions](#)

imam ghozali 2008 sem metode alternatif dengan pls

[introduction to econometrics dougherty third edition](#)

[integrated chinese level 1 part 2 workbook traditional character 3rd edition cheng tsui chinese language series chinese edition](#)

[instrument engineers handbook download](#)

[indoor marijuana horticulture](#)

international business by subba rao

[introduction to fashion design](#)

[impianti meccanici pareschi](#)

Comparing Methods Of Measurement Why Plotting Difference :

Self-Help Resources / Guardianship and Conservatorship Requirements of a Guardian or Conservator of a Minor · Reports

required from the conservator · Moving a conservatorship · Withdrawing funds in a restricted ... Guardianship of a Minor This page is for the appointment by the district court of an individual to serve as guardian of a minor child. Its primary focus is on procedures when ... Guardianship Guardianship is a legal process that allows someone (usually a family member) to ask the court to find that a person age 18 or older is unable (incompetent) ... Office of Public Guardian - Utah Aging and Adult Services The Office of Public Guardian (OPG) provides guardianship and conservatorship services for adults* who are unable to make basic life decisions for ... Guardianship Associates of Utah We provide direct guardianship and conservator services, as well as trust management and executor services for Special Needs Trusts. We are also passionate in ... Guardianship & Conservatorship Dec 6, 2017 — A conservatorship and guardianship allows someone to act for someone else. They cannot be created without an order by a judge. Guardianships and Conservatorships in Utah In Utah, a guardian primarily has the court-appointed power to provide for the physical well-being of a protected person and a conservator is the court- ... Considering Guardianship Guardianship is a court process. The State of Utah allows for two types of guardianship. These include a plenary (full) or limited guardianship. A Plenary ... Information — Guardianship Associates of Utah Guardianship is surrogate decision making for a person who is over the age of 18 and is unable to make decisions due to some level of incapacity. How to Get Guardianship of a Child in Utah Traditional guardianship. The interested adult files a court petition directly with the help of Heber lawyers to the county district court where the minor lives ... Senior Probation Officer Csea Booklets (2022) Senior Probation Officer Csea Booklets. 1. Senior Probation Officer Csea Booklets. Senior Probation Officer Csea Booklets. Downloaded from ai-neo.uw.edu by. Senior Probation Officer Csea Booklets Oct 24, 2023 — It will totally ease you to see guide senior probation officer csea booklets as you such as. ... senior probation officer csea booklets ... CIVIL SERVICE TEST PREP Prepare for your civil service examination with free Civil Service Test Preparation Booklets, online courses and civil service test preparation workshops. #75822 PROBATION OFFICER 2/SENIOR ... DISTINGUISHING FEATURES OF THE CLASS: This is a senior level professional position in a probation department responsible for the control, supervision and care ... Probation and Parole Series The written tests for the entry-level titles of the Probation and Parole Series will cover the following subject areas: 1. PRINCIPLES AND PRACTICES OF OFFENDER ... DEPARTMENT OF HUMAN RESOURCES Study Guide ... This guide was developed to help you prepare to take the written examination for. Senior Probation Officer. It contains general test-taking advice and also ... Test guides - NYS Civil Service - New York State No information is available for this page. Probation Supervisor I | Erie County Civil Service ... Apr 17, 2019 — Examples of Duties: A Probation Supervisor I supervises the activities of four to seven Probation Officer Trainees, Probation Officers 1 or 2/ ... Study Guides Study Guides. Paper copies of the study guides are available at the Human Resources Department. ... Senior Stenographer/Senior Typist · Social Welfare Examiner ... Confused About Catalytic Converter Removal on 2015 HD ... Mar 29, 2023 — I have a 2015 HD Tri Glide. I've been told that removing the catalytic converter would make it run cooler.

I've viewed YouTube video on how ... Photos Catalytic Converter Removal Jun 26, 2014 — Tri Glide, RG3 & Freewheeler Models - Photos Catalytic Converter Removal - Did a search and came up empty with photos.....would someone ... How to remove the catalytic converter on Harley Davidson Aug 1, 2020 — The easiest way is to just swap out your exhaust for something aftermarket. I believe all the Harleys have the cat in the pipe somewhere. The ... Performance changes after removal of M8 Catalytic Converter Feb 13, 2019 — I have a 2017 RGU with Stage II Torque Cam and am thinking of removing my catalytic converter. I just wondering what experience others have ... Removing the Catalytic Converter from a 2010 Harley Nov 10, 2009 — Testing by several tuners found that it helped but it was much better to remove all of the cat. Fullsac performance has done lots of testing on ... Cat Removal, and resulting tune needed? Aug 2, 2015 — Hello all. I am a newbie here and I have a question. We own a 2013 Tri Glide and I just installed Screaming Eagle pre EPA mufflers and a K&N a ...