

Harmonic Balancer Torque Tester

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Sponsor: Mike Gissi

Background

Harmonic balancers damp torsional vibration from the crankshaft of a car engine. Without harmonic balancers, the engine smoothness and durability are greatly decreased as the overall torsion of the crankshaft is increased. Harmonic balancers are made of three components: the hub, the inertia ring, and the rubber ring. Between the hub and inertia ring is the rubber ring. This rubber ring affects damping effects through its torsional spring rate, which is dependent on the properties of the rubber.

Problem Statement

A machine is needed to test the functional characteristics of the rubber ring contained within a typical harmonic balancer.

Requirements:

- This test will be conducted by holding either the hub or inertia ring statically in a fixture and applying the other with a torque until the rubber ring slips or shears.
- The machine will collect live data showing the relationship of torque versus angular displacement to determine the torsional spring rate and torque resistance of the assembly.



Project Objectives

Mechanical

Create a mechanism which can drive a specified torque or a torque resulting in 5 degrees of angular deformation or failure

Electrical

A fully automated testing process with sensors which can precisely record torque and the resulting angular deformation

Coding

Develop a computer program that can convert the output from sensors into values of torque and deformation as well as summarize the data on a graphical plot

Sharmonic Balancer Torque

George Reid



Sharmonic Balancer Torque:

Torqueflite A-727 Transmission Handbook HP1399 Carl Munroe,2003-08-05 This book provides step by step instructions for how to modify Chrysler s 904 Torqueflite automatic transmission for drag racing road racing and circle racing Topics include theory of operation transbrakes valve bodies adapters dissembly modifications assembly adjustments installation high horsepower application and torque converters **How to Rebuild the Small-Block Ford** George Reid,2008 This revised and updated color edition of How to Rebuild the Small Block Ford walks you step by step through a rebuild including planning your rebuild disassembly and inspection choosing the right parts machine work assembling your engine and first firing and break in **How to Rebuild Pontiac V-8s - Updated Edition** Rocky Rotella,2020-01-15 Restore your Pontiac V 8 engine to original factory performance and specifications in this revised edition of a Pontiac best seller Under the guidance of Semon Bunkie Knutson John DeLorean and a host of creative and innovative people Pontiac established its own identity and distinct V 8 engine platform under the GM banner In 1955 Pontiac s V 8 started out at a meager 287 ci but it was an auspicious beginning to an illustrious line of engines The potent powerplant grew and evolved over the coming decades which included the 389 Tri Power 421 Ram Air IV 400 428 and the Super Duty 455 These V 8s powered a number of legendary cars including the GTO Firebird Trans Am and many others In this updated edition longtime Pontiac expert Rocky Rotella guides the reader through the entire rebuild process Drawing on his vast experience Rotella uses detailed captions and explanatory photos to show each crucial step of the disassembly inspection machine work parts selection assembly and break in process This book instructs the reader how to skillfully pull the engine and prevent damage to the car It documents how to carefully inspect the components for problems and fix these issues that could spell doom for a newly rebuilt engine Finding a reputable and professional machine shop that specializes in Pontiac engines is discussed as well as aftermarket parts and OEM parts interchange for high performance so you can select the best parts for a particular engine All essential machine shop procedures are covered in detail Also included is a new chapter on casting numbers and parts compatibility Most important as with all Workbench series titles the methodical and practical approach provides the insight and vital information required for the task This the first ever book dedicated to rebuilding the Pontiac V 8 engine is a valuable addition to any Pontiac enthusiast s library How to Build Max Performance Ford V-8s on a Budget George Reid,2001 This revved up volume addresses high performance engines such as the ones found in Mustangs and emphasizes a budget approach to building them 300 photos *Difficult Engineering Concepts Better Explained: Statics And Applications* Jay F Tu,2020-07-21 Engineering statics discusses proper ways of conducting force analysis This unique compendium treats fundamental force analysis in a systematic and comprehensive manner The indispensable volume is suitable for undergraduate students to learn the subject in greater depth for graduate students to review essential skills in force analysis correctly and for practicing engineers to review and refresh key concepts This useful reference text also presented numerous application examples for

readers in solving daily practical problems How to Build High-Performance Chevy LS1/LS6 V-8s Will Handzel, 2008 This new color edition is essential for the enthusiast who wants to get the most performance out of this new engine design but is only familiar with the older Chevy small blocks Covered is everything you need to know about these engines including the difficult engine removal and installation simple engine bolt ons electronic controls for the Generation III engine and detailed engine builds at four different power levels How to Build a Flathead Ford V-8 George McNicholl, Ford s Model T put America on wheels His flathead valve in block V8 introduced in 1932 was durable powerful and extremely adaptable and is the engine which inspired three generations of hot rodders and put America onto the race tracks How to Build a Flathead Ford V 8 was written with machine shop experience and features all the parts and procedures that pertain to the world s most famous engine Detailed information features all clearances and machining procedures and includes 250 photos in full color 4.6L & 5.4L Ford Engines George Reid, 2015-04-15 Since 1991 the popular and highly modifiable Ford 4 6 liter has become a modern day V 8 phenomenon powering everything from Ford Mustangs to hand built hot rods and the 5 4 liter has powered trucks SUVs the Shelby GT500 and more The wildly popular 4 6 liter has created an industry unto itself with a huge supply of aftermarket high performance parts machine services and accessories Its design delivers exceptional potential flexibility and reliability The 4 6 liter can be built to produce 300 hp up to 2 000 hp and in turn it has become a favorite among rebuilders racers and high performance enthusiasts 4 6 5 4 Liter Ford Engines How to Rebuild expertly guides you through each step of rebuilding a 4 6 liter as well as a 5 4 liter engine providing essential information and insightful detail This volume delivers the complete nuts and bolts rebuild story so the enthusiast can professionally rebuild an engine at home and achieve the desired performance goals In addition it contains a retrospective of the engine family essential identification information and component differences between engines made at Romeo and Windsor factories for identifying your engine and selecting the right parts It also covers how to properly plan a 4 6 5 4 liter build up and choose the best equipment for your engine s particular application As with all Workbench Series books this book is packed with detailed photos and comprehensive captions where you are guided step by step through the disassembly machine work assembly start up break in and tuning procedures for all iterations of the 4 6 5 4 liter engines including 2 valve and 3 valve SOHC and the 4 valve DOHC versions It also includes an easy to reference spec chart and suppliers guide so you find the right equipment for your particular build up Ford Inline Six Matt Cox, Barton Maurer, 2020-12-15 Rebuild and modify your Ford inline six with help from the leading performance builders of these engines Vintage Inlines Covering Ford s small 6 cylinder engine made famous in Falcons Comets Mustangs and many other models from the 1960s and 1970s this book has everything you need to know from step by step rebuilding instructions to performance parts that will set you apart from the rest of the crowd If this is your first engine build you ll be glad to know that every aspect of a complete rebuild is here Starting with engine removal you ll learn all the different steps including examination machine work reassembly and reinstallation The mystery is revealed on

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Table of Contents Sharmonic Balencer Torque

1. Understanding the eBook Sharmonic Balencer Torque
 - The Rise of Digital Reading Sharmonic Balencer Torque
 - Advantages of eBooks Over Traditional Books
2. Identifying Sharmonic Balencer Torque
 - 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 Sharmonic Balencer Torque
 - User-Friendly Interface
4. Exploring eBook Recommendations from Sharmonic Balencer Torque
 - Personalized Recommendations
 - Sharmonic Balencer Torque User Reviews and Ratings
 - Sharmonic Balencer Torque and Bestseller Lists
5. Accessing Sharmonic Balencer Torque Free and Paid eBooks
 - Sharmonic Balencer Torque Public Domain eBooks
 - Sharmonic Balencer Torque eBook Subscription Services
 - Sharmonic Balencer Torque Budget-Friendly Options
6. Navigating Sharmonic Balencer Torque eBook Formats

- ePub, PDF, MOBI, and More
- Sharmonic Balencer Torque Compatibility with Devices
- Sharmonic Balencer Torque Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Sharmonic Balencer Torque
 - Highlighting and Note-Taking Sharmonic Balencer Torque
 - Interactive Elements Sharmonic Balencer Torque
- 8. Staying Engaged with Sharmonic Balencer Torque
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Sharmonic Balencer Torque
- 9. Balancing eBooks and Physical Books Sharmonic Balencer Torque
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Sharmonic Balencer Torque
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Sharmonic Balencer Torque
 - Setting Reading Goals Sharmonic Balencer Torque
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Sharmonic Balencer Torque
 - Fact-Checking eBook Content of Sharmonic Balencer Torque
 - 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

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