

lucas cav injector pump diagram

lucas cav injector pump diagram is a critical resource for understanding the operation, maintenance, and troubleshooting of Lucas CAV fuel injection pumps, commonly found in diesel engines. This article provides a comprehensive overview of the Lucas CAV injector pump diagram, its key components, how the pump functions, and best practices for interpreting technical schematics. Whether you're a mechanic, engineer, or enthusiast seeking to optimize diesel engine performance, this guide covers everything you need to know. Readers will discover the importance of each part, common issues, and step-by-step instructions for reading and using injector pump diagrams. With clear explanations and practical advice, this article is designed to help you achieve accuracy and confidence when working with Lucas CAV injector pumps.

- Understanding the Lucas CAV Injector Pump Diagram
- Key Components of the Lucas CAV Injector Pump
- How the Lucas CAV Injector Pump Works
- Interpreting the Injector Pump Diagram
- Common Issues and Troubleshooting Using the Diagram
- Maintenance Tips for Lucas CAV Injector Pumps
- Frequently Asked Questions

Understanding the Lucas CAV Injector Pump Diagram

The Lucas CAV injector pump diagram is a technical illustration that depicts the internal and external structure of the fuel injection pump. This diagram is essential for professionals and hobbyists working with diesel engines equipped with Lucas CAV pumps. It provides a visual representation of the pump's components, fuel pathways, and mechanical linkages, allowing users to identify each part and understand its function within the overall system. By referencing the diagram, users can effectively diagnose problems, perform repairs, and carry out regular maintenance. The lucas cav injector pump diagram is especially valuable when sourcing replacement parts or seeking to improve fuel efficiency.

A well-detailed injector pump diagram offers clarity on the pump's assembly, highlighting the correct orientation of parts and their interconnections. It can also indicate the direction of fuel flow, the locations of seals and gaskets, and the timing mechanism. Familiarity with the lucas cav injector pump diagram enables users to avoid common mistakes and ensures precise reassembly after service.

Key Components of the Lucas CAV Injector Pump

The Lucas CAV injector pump features several integral components, each playing a crucial role in the efficient delivery of fuel to diesel engine cylinders. Understanding these components is vital for interpreting the injector pump diagram and ensuring optimal performance. Below is an overview of the main parts commonly identified in the Lucas CAV injector pump diagram.

Pump Body and Housing

The pump body serves as the framework that houses all internal components. It provides structural support and ensures protection against external contaminants. The housing is often constructed from durable metals to withstand high pressure and temperature variances.

Drive Shaft and Cam Plate

The drive shaft connects the pump to the engine, transmitting rotational energy necessary for the pump's operation. The cam plate, attached to the drive shaft, controls the timing and movement of the plungers, ensuring synchronized fuel delivery.

Plunger Assemblies

Plunger assemblies are responsible for compressing and delivering fuel. They move in a reciprocating fashion, driven by the cam plate, and create the required pressure to inject fuel into the engine.

Delivery Valves

Delivery valves regulate the flow of pressurized fuel from the plunger assemblies to the injector lines. They prevent backflow and maintain consistent pressure, which is essential for precise fuel injection.

Governor Mechanism

The governor controls the fuel quantity injected based on engine speed and load. It ensures smooth operation and prevents engine overspeed by adjusting the position of the pump's

control rack.

Fuel Inlet and Return Connections

These connections manage the entry and exit of fuel within the pump. The fuel inlet allows diesel to enter the pump, while the return connection directs excess fuel back to the tank, preventing overflow and maintaining system pressure.

- Pump Body and Housing
- Drive Shaft and Cam Plate
- Plunger Assemblies
- Delivery Valves
- Governor Mechanism
- Fuel Inlet and Return Connections

How the Lucas CAV Injector Pump Works

The operation of the Lucas CAV injector pump is a precise process that involves several synchronized mechanical actions. The pump receives rotational energy from the engine's drive shaft, which turns the cam plate. The cam plate's lobes push the plungers in and out of their cylinders, compressing the fuel within each plunger assembly.

As the plunger reaches its topmost position, the highly pressurized fuel is forced through the delivery valve and into the injector line. The governor mechanism simultaneously monitors engine speed and adjusts the quantity of fuel delivered, ensuring optimal combustion and power output. Excess fuel returns to the tank through the fuel return connection, maintaining balanced pressure within the system.

The Lucas CAV injector pump diagram illustrates these mechanical interactions, making it easier to understand the pump's sequence of operations and troubleshoot any irregularities in fuel delivery or engine performance.

Interpreting the Injector Pump Diagram

Accurate interpretation of the Lucas CAV injector pump diagram is essential for effective maintenance, repair, and troubleshooting. The diagram typically consists of labeled

illustrations, cross-sectional views, and flow arrows indicating the movement of fuel and mechanical linkages.

Identifying Parts and Pathways

Begin by locating major components such as the pump body, drive shaft, cam plate, plungers, delivery valves, and governor. The diagram should provide clear labels for each part, and arrows may show the direction of fuel flow. Understanding these pathways helps users pinpoint issues related to fuel delivery or pressure loss.

Recognizing Timing and Synchronization Mechanisms

Timing marks and synchronization points are often depicted in the diagram. These are critical for ensuring that the pump delivers fuel at the precise moment required for efficient engine operation. Referencing these marks during installation or adjustment helps maintain accurate timing.

Using the Diagram for Repairs

The Lucas CAV injector pump diagram is invaluable when disassembling or reassembling the pump. It provides reference points for the correct alignment of components, placement of seals and gaskets, and routing of fuel lines. Having the diagram on hand minimizes the risk of errors and streamlines the repair process.

Common Issues and Troubleshooting Using the Diagram

Lucas CAV injector pumps are renowned for their reliability, but like all mechanical systems, they can experience faults. The injector pump diagram serves as a roadmap for identifying and resolving common issues, particularly those related to fuel delivery, pressure loss, and timing misalignment.

Fuel Leaks

Fuel leaks may occur due to worn seals, damaged gaskets, or loose connections. The diagram helps users locate these parts and assess whether they require replacement or tightening.

Loss of Pressure

Pressure loss can result from faulty plunger assemblies or blocked delivery valves. By referencing the diagram, users can identify the affected components and take appropriate corrective measures, such as cleaning or replacing parts.

Timing Problems

Incorrect timing may cause poor engine performance or increased emissions. The diagram's timing marks and synchronization points assist in recalibrating the pump to restore optimal operation.

1. Inspect seals and gaskets for wear.
2. Check plunger assemblies and delivery valves for blockages.
3. Verify correct timing using the diagram.

Maintenance Tips for Lucas CAV Injector Pumps

Proper maintenance is essential for extending the life and performance of Lucas CAV injector pumps. The diagram provides a visual checklist for routine inspections and preventive care.

Routine Inspection

Regularly examine the pump for signs of wear, corrosion, or damage. Pay special attention to seals, gaskets, and moving parts, as indicated in the diagram.

Cleaning and Lubrication

Clean the pump exterior and internal components to prevent the buildup of dirt and debris. Lubricate moving parts according to manufacturer specifications to minimize friction and wear.

Replacement of Worn Parts

Use the lucas cav injector pump diagram to identify and replace worn or damaged components promptly. This proactive approach reduces the risk of breakdowns and ensures consistent fuel delivery.

Frequently Asked Questions

Below are some of the most common questions and answers regarding the lucas cav injector pump diagram, troubleshooting, and maintenance strategies.

Q: What is the purpose of a lucas cav injector pump diagram?

A: The lucas cav injector pump diagram illustrates the internal and external components of the fuel injection pump, helping users understand its structure and function for effective maintenance and troubleshooting.

Q: Which parts are most commonly labeled in the injector pump diagram?

A: Typical diagrams label parts such as the pump body, drive shaft, cam plate, plunger assemblies, delivery valves, governor mechanism, and fuel inlet/return connections.

Q: How can I use the diagram to fix fuel leaks?

A: Use the diagram to locate seals, gaskets, and connections within the pump. Inspect these areas for damage or wear and replace faulty parts to resolve leaks.

Q: What role does the governor mechanism play?

A: The governor mechanism controls fuel quantity based on engine speed and load, ensuring smooth operation and preventing overspeed conditions.

Q: How often should I inspect my Lucas CAV injector pump?

A: Regular inspection every 6–12 months or according to manufacturer recommendations helps maintain optimal pump performance and prevents unexpected failures.

Q: Can the diagram assist with timing adjustments?

A: Yes, the diagram shows timing marks and synchronization points, enabling accurate timing adjustments during installation or repair.

Q: What are signs of a failing injector pump?

A: Symptoms include reduced engine power, hard starting, fuel leaks, excessive smoke, and irregular engine noise.

Q: Is cleaning the pump necessary for maintenance?

A: Cleaning both the exterior and accessible internal components prevents contamination and contributes to reliable pump operation.

Q: Do all Lucas CAV pumps share the same diagram?

A: While many components are similar, specific models may have unique features. Always reference the diagram specific to your pump model for accuracy.

Q: Why is the lucas cav injector pump diagram important for troubleshooting?

A: It provides a visual guide to identify component locations, fuel pathways, and mechanical linkages, streamlining the troubleshooting and repair process.

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Lucas CAV Injector Pump Diagram: A Comprehensive Guide

Understanding your vehicle's fuel injection system is crucial for maintaining performance and longevity. This comprehensive guide focuses on the Lucas CAV (CAV Bosch) injector pump, a system renowned for its reliability but requiring specific knowledge for repair and maintenance. We'll delve

into detailed Lucas CAV injector pump diagrams, explaining their components and functionality. Whether you're a seasoned mechanic or a curious DIY enthusiast, this post will equip you with the knowledge to navigate the intricacies of this vital engine component.

Understanding the Lucas CAV Injector Pump

The Lucas CAV (also known as CAV Bosch) injector pump is a type of distributor-type injection pump widely used in diesel engines. Unlike modern common rail systems, it utilizes a single, high-pressure pump to deliver fuel to individual injectors. This system, though older, is still prevalent in many vehicles and is known for its robust build quality and simplicity, relative to newer systems. Understanding its components is key to successful troubleshooting and repair.

Key Components of the Lucas CAV Injector Pump

The Lucas CAV pump is comprised of several critical parts, each playing a vital role in the fuel delivery process. A visual understanding via a Lucas CAV injector pump diagram is essential. These components include:

Driving Shaft: This connects the pump to the engine's camshaft, providing the mechanical drive for the pump's internal components.

Delivery Valves: These precisely control the amount of fuel delivered to each injector. Malfunctioning delivery valves are a common source of problems.

Plungers: These are the heart of the injection process, drawing fuel and delivering it under high pressure. Wear on plungers can lead to uneven fuel distribution and poor engine performance.

Timing Gears: Precise timing is paramount. These gears ensure the correct synchronization between the pump and the engine's cycle.

Fuel Feed and Return Lines: These transport fuel to and from the pump. Blockages in these lines can severely impact performance.

Governor: This regulates the fuel supply based on engine speed and load. A faulty governor can lead to erratic engine behavior.

Interpreting a Lucas CAV Injector Pump Diagram

A Lucas CAV injector pump diagram isn't merely a picture; it's a roadmap to understanding the

pump's inner workings. These diagrams, often found in workshop manuals or online resources, typically use a combination of exploded views and schematic representations to illustrate the relationships between components.

Decoding the Diagram: A Step-by-Step Guide

1. **Identify Key Components:** Familiarize yourself with the names and locations of the critical components listed above.
2. **Trace the Fuel Path:** Follow the path of fuel from the inlet to the outlet, paying attention to how it flows through the plungers and delivery valves.
3. **Understand the Timing Mechanism:** Observe how the timing gears interact with the driving shaft to ensure precise fuel delivery at the correct engine cycle.
4. **Locate Adjustment Points:** Many diagrams show adjustment screws or points, crucial for calibrating the pump's fuel delivery.
5. **Recognize Interconnections:** Notice how different components interact – for instance, how the governor affects the fuel delivery mechanism.

Troubleshooting with a Lucas CAV Injector Pump Diagram

A clear Lucas CAV injector pump diagram is indispensable for troubleshooting. By visually inspecting the diagram alongside the physical pump, you can pinpoint potential problem areas.

Common Issues and Their Visual Identification

Fuel Leaks: A diagram can help you quickly identify potential leak points based on the position of seals and gaskets.

Timing Issues: The diagram clarifies the relationship between the timing gears and the engine's crankshaft, allowing you to assess timing problems.

Plunger Wear: A visual comparison between a diagram and the actual pump can reveal signs of wear and tear on the plungers.

Finding a Reliable Lucas CAV Injector Pump Diagram

Finding a suitable diagram might require some searching. Start with your vehicle's workshop manual, which should contain detailed diagrams and specifications. Online resources, such as repair forums and specialized websites, might also offer helpful diagrams. Remember to ensure the diagram matches your specific pump model and engine type, as variations exist.

Conclusion

Understanding your vehicle's fuel system is essential for maintaining its health and performance. The Lucas CAV injector pump diagram serves as a crucial tool for anyone working on this system. By carefully studying the diagram and understanding the pump's components and functions, you can perform accurate diagnostics, repairs, and preventative maintenance. Remember always to prioritize safety and consult a professional if you're unsure about any aspect of the repair process.

FAQs

1. Can I repair a Lucas CAV injector pump myself? While possible for some repairs, it requires specialized tools and expertise. Incorrect repairs can lead to severe engine damage. Consider your skill level before attempting repairs.
2. Where can I find a Lucas CAV injector pump diagram for my specific vehicle? Your vehicle's workshop manual is the best place to start. Online forums dedicated to your vehicle model may also be helpful.
3. What are the common signs of a failing Lucas CAV injector pump? Symptoms include rough running, poor starting, smoke from the exhaust, and loss of power.
4. How often should I have my Lucas CAV injector pump serviced? Regular maintenance intervals depend on usage and mileage. Consult your vehicle's maintenance schedule for recommendations.
5. Are there alternatives to the Lucas CAV injector pump for my vehicle? In some cases, replacement with a newer, more modern fuel injection system might be possible, though often expensive and requiring significant modifications.

lucas cav injector pump diagram: [Marine Diesel Basics 1](#) Dennison Berwick, 2017-05-11
Seeing is Understanding. The first VISUAL guide to marine diesel systems on recreational boats. Step-by-step instructions in clear, simple drawings explain how to maintain, winterize and

recommission all parts of the system - fuel deck fill - engine - batteries - transmission - stern gland - propeller. Book one of a new series. Canadian author is a sailor and marine mechanic cruising aboard his 36-foot steel-hulled Chevrier sloop. Illustrations: 300+ drawings Pages: 222 pages Published: 2017 Format: softcover Category: Inboards, Gas & Diesel

lucas cav injector pump diagram: Fundamentals of Medium/Heavy Duty Diesel Engines

Gus Wright, 2021-09-30 Fundamentals of Medium/Heavy Duty Diesel Engines, Second Edition offers comprehensive coverage of every ASE task with clarity and precision in a concise format that ensures student comprehension and encourages critical thinking. This edition describes safe and effective diagnostic, repair, and maintenance procedures for today's medium and heavy vehicle diesel engines--

lucas cav injector pump diagram: Hillier's Fundamentals of Motor Vehicle Technology

Victor Albert Walter Hillier, Peter Coombes, 2004 Significantly updated to cover the latest technological developments and include latest techniques and practices.

lucas cav injector pump diagram: Diesel William King Toboldt, 1980

lucas cav injector pump diagram: Diesel Engine and Fuel System Repair John F. Dagel, 1988

Written by a practitioner, this comprehensive guide presents all the information and skills needed by the proficient diesel mechanic. Throughout, the material emphasizes the practical, nuts-and-bolts aspects of the trade. Each chapter contains a brief introduction, a list of objectives, and a general treatment of the subject at hand, a treatment of related component parts and nomenclature that familiarizes readers with terms and parts and a detailed discussion of the theory of operation, repair and overhaul, assembly, testing, and adjustment. Procedures are highlighted for easy reference. Also included are practical advice and approaches to troubleshooting as well as summaries, lists of review questions, and numerous illustrations.

lucas cav injector pump diagram: Light and Heavy Vehicle Technology M.J. Nunney,

2013-10-22 Light and Heavy Vehicle Technology, Second Edition deals with the theory and practice of vehicle maintenance, procedure, and diagnosis of vehicle trouble, including technological advances such as four-wheel drive, four-wheel steering, and anti-lock brakes. The book reviews the reciprocating piston petrol engine, the diesel engine, the combustion chambers, and the different means of combustion processes. To counter friction, heat and wear, lubrication to the different moving parts is important. To counter excessive heat which can cause breakdown of lubricating oil films and materials such as gaskets, O-rings, the engine is designed with a cooling system that uses air, water, or engine coolants. Petrol engines use the carburation or injection type of fuel delivery; diesel engines use a high pressure system of fuel injection owing to the higher pressures existing in the diesel combustion chamber. The text explains the operation of the other parts of the vehicle including the ignition and starter system, emission controls, layshaft gearboxes, drive lines, and suspension systems. Heavy vehicles need highly efficient air brakes to stop them compared to the hydraulic brake systems used in smaller and lighter vehicles. The book is suitable for mechanical engineers, engine designers, students, and instructors in mechanical and automotive engineering.

lucas cav injector pump diagram: Sports Car Graphic , 1964

lucas cav injector pump diagram: Ship & Boat International , 1988

lucas cav injector pump diagram: Diesel Progress North American , 1987

lucas cav injector pump diagram: Automotive Industry of America , 1979

lucas cav injector pump diagram: Diesel & Gas Turbine Worldwide Catalog , 1983

lucas cav injector pump diagram: The Records of the Proceedings and the Printed Papers Australia. Parliament, 1960 All printed Parliamentary papers common to both Houses are included in v. 2, etc.

lucas cav injector pump diagram: Records of the Proceedings and Printed Papers of the Parliament Australia. Parliament, 1960

lucas cav injector pump diagram: Motorboating - ND , 1982-01

lucas cav injector pump diagram: The Technology Teacher , 1983

lucas cav injector pump diagram: Braby's Commercial Directory of South, East and Central

Africa , 1969 Includes: South Africa, Rhodesia, Zambia, Malawi, South-West Africa, Mocambique, Angola, Swaaziland, Botsawana and Lesotho.

lucas cav injector pump diagram: Troubleshooting and Repair of Diesel Engines Paul Dempsey, 2007-10-15 Harness the Latest Tools and Techniques for Troubleshooting and Repairing Virtually Any Diesel Engine Problem The Fourth Edition of Troubleshooting and Repairing Diesel Engines presents the latest advances in diesel technology. Comprehensive and practical, this revised classic equips you with all of the state-of-the-art tools and techniques needed to keep diesel engines running in top condition. Written by master mechanic and bestselling author Paul Dempsey, this hands-on resource covers new engine technology, electronic engine management, biodiesel fuels, and emissions controls. The book also contains cutting-edge information on diagnostics...fuel systems...mechanical and electronic governors...cylinder heads and valves...engine mechanics...turbochargers...electrical basics...starters and generators...cooling systems...exhaust aftertreatment...and more. Packed with over 350 drawings, schematics, and photographs, the updated Troubleshooting and Repairing Diesel Engines features: New material on biodiesel and straight vegetable oil fuels Intensive reviews of troubleshooting procedures New engine repair procedures and tools State-of-the-art turbocharger techniques A comprehensive new chapter on troubleshooting and repairing electronic engine management systems A new chapter on the worldwide drive for greener, more environmentally friendly diesels Get Everything You Need to Solve Diesel Problems Quickly and Easily • Rudolf Diesel • Diesel Basics • Engine Installation • Fuel Systems • Electronic Engine Management Systems • Cylinder Heads and Valves • Engine Mechanics • Turbochargers • Electrical Fundamentals • Starting and Generating Systems • Cooling Systems • Greener Diesels

lucas cav injector pump diagram: *The Oil Engine and Gas Turbine* , 1962

lucas cav injector pump diagram: *Ward's Auto World* , 1982

lucas cav injector pump diagram: *Troubleshooting and Repairing Diesel Engines, 5th Edition* Paul Dempsey, 2018-05-01 This fully updated, money-saving guide shows, step by step, how to repair and maintain diesel engines Thoroughly revised to cover the latest advances, this resource equips you with the state-of-the-art tools and techniques needed to keep diesel engines running smoothly and in top condition. The book offers comprehensive and practical coverage of diesel technology and clearly explains new diesel/hydrogen and diesel/methane engines. Troubleshooting and Repairing Diesel Engines, Fifth Edition covers new engine technology, electronic engine management, biodiesel fuels, and emissions controls. This new edition contains cutting-edge information on recent developments, including turbocharging and changes in the composition of conventional fuel. You will find out how to successfully carry out repairs and get professional results while saving money. • Covers a broad range of diesel engine makes and models • Features helpful facts, specifications, and flow charts • Written by a master mechanic and bestselling author

lucas cav injector pump diagram: *Chilton's Auto Repair Manual 1986* Chilton Book Company, 1985

lucas cav injector pump diagram: *Old Stationary Engines* David W. Edgington, 1980

lucas cav injector pump diagram: *Canadian Shipping and Marine Engineering News* , 1966

lucas cav injector pump diagram: *Motor Auto Repair Manual* , 1984 Spine title: Motor auto repair. Provides specific instructions for the repair of cars built from 1979 to 1985.

lucas cav injector pump diagram: *Machinery Lloyd* , 1983

lucas cav injector pump diagram: *Modern High-speed Oil Engines* Charles Wallace Chapman, 1955

lucas cav injector pump diagram: *California Builder & Engineer* , 1994

lucas cav injector pump diagram: *Automotive Engineering* , 1985

lucas cav injector pump diagram: *Image Analysis of Sprays by Light Extinction Technique* Mahmoud Saad El-Beshbeeshy, 1992

lucas cav injector pump diagram: *Chilton's Auto Repair Manual 1981-1988* Chilton

Automotive Books, 1988 The auto repair manual that do-it-yourselfers have relied on to save money now covers 1981-88 domestic cars. This updated edition covers Detroit's newest models including the new Chrysler TC, Chevrolet Corsica and Pontiac LeMans. The most asked-for book of its kind. More than 3,000 illustrations.

lucas cav injector pump diagram: Chilton's Diesel Engine Service Manual, 1984 John H. Weise, 1984

lucas cav injector pump diagram: *Convergence 84* , 1984

lucas cav injector pump diagram: *Introduction to Modeling and Control of Internal Combustion Engine Systems* Lino Guzzella, Christopher Onder, 2013-03-14 Internal combustion engines still have a potential for substantial improvements, particularly with regard to fuel efficiency and environmental compatibility. These goals can be achieved with help of control systems. Modeling and Control of Internal Combustion Engines (ICE) addresses these issues by offering an introduction to cost-effective model-based control system design for ICE. The primary emphasis is put on the ICE and its auxiliary devices. Mathematical models for these processes are developed in the text and selected feedforward and feedback control problems are discussed. The appendix contains a summary of the most important controller analysis and design methods, and a case study that analyzes a simplified idle-speed control problem. The book is written for students interested in the design of classical and novel ICE control systems.

lucas cav injector pump diagram: *Winter Annual Meeting* American Society of Mechanical Engineers, 1983

lucas cav injector pump diagram: The Road Way , 1990

lucas cav injector pump diagram: **Automotive Engine Performance: Practice manual** Ken Layne, 1993

lucas cav injector pump diagram: Manual of Engineering Drawing Colin H. Simmons, Dennis E. Maguire, 2003-10-21 The Manual of Engineering Drawing has long been recognised as the student and practising engineer's guide to producing engineering drawings that comply with ISO and British Standards. The information in this book is equally applicable to any CAD application or manual drawing. The second edition is fully in line with the requirements of the new British Standard BS8888: 2002, and will help engineers, lecturers and students with the transition to the new standards. BS8888 is fully based on the relevant ISO standards, so this book is also ideal for an international readership. The comprehensive scope of this book encompasses topics including orthographic, isometric and oblique projections, electric and hydraulic diagrams, welding and adhesive symbols, and guidance on tolerancing. Written by a member of the ISO committee and a former college lecturer, the Manual of Engineering Drawing combines up-to-the-minute technical accuracy with clear, readable explanations and numerous diagrams. This approach makes this an ideal student text for vocational courses in engineering drawing and undergraduates studying engineering design / product design. Colin Simmons is a member of the BSI and ISO Draughting Committees and an Engineering Standards Consultant. He was formerly Standards Engineer at Lucas CAV.* Fully in line with the latest ISO Standards* A textbook and reference guide for students and engineers involved in design engineering and product design* Written by a former lecturer and a current member of the relevant standards committees

lucas cav injector pump diagram: *Chilton's CCJ.* , 1989-07

lucas cav injector pump diagram: *Braby's Transvaal Directory* , 1969

lucas cav injector pump diagram: **Paper** , 1983

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