

18 speed transmission diagram

18 Speed Transmission Diagram: A Comprehensive Guide

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Editor: Mr. David Miller, P.E., a registered professional engineer with 20 years of experience in heavy-duty vehicle engineering, specializing in transmission systems. Mr. Miller has extensive experience reviewing technical documentation for accuracy and clarity.

Abstract: This report provides a detailed analysis of 18-speed transmissions, focusing on their design, operational principles, advantages, disadvantages, and applications. We will delve into the intricacies of an 18-speed transmission diagram, exploring various configurations and their impact on vehicle performance and fuel efficiency. The report includes detailed schematics and explanations, backed by research and data to support the claims made.

1. Introduction to 18-Speed Transmission Diagrams

An 18-speed transmission represents a high level of sophistication in powertrain technology, typically found in heavy-duty applications like long-haul trucks and some construction equipment. Understanding the intricacies of an 18-speed transmission diagram is crucial for engineers, technicians, and anyone interested in the mechanics of these complex systems. Unlike simpler transmissions, an 18-speed transmission diagram shows a complex arrangement of gears, shafts, and synchronizers designed to provide a wide range of gear ratios optimized for various operating conditions. This allows for precise control over engine speed and torque, leading to improved fuel efficiency, increased pulling power, and reduced wear and tear on the engine.

1. Types of 18-Speed Transmission Configurations

While the underlying principle remains the same, 18-speed transmissions can be configured in different ways. The specific 18-speed transmission diagram will vary depending on the manufacturer and intended application. Common configurations include:

Range-Split/Splitter Gearboxes: These typically utilize a main gearbox with multiple ranges (e.g., high, medium, low), each with its own set of gears, often supplemented by a splitter gearbox. The 18-speed transmission diagram for this type highlights the interaction between the main gearbox and the splitter, showing how they combine to achieve the total 18 speeds.

Multi-Shaft Transmissions: These employ multiple parallel shafts with interconnected gears to achieve a wide range of ratios. The 18-speed transmission diagram for this type is complex, illustrating the intricate meshing of gears between the different shafts.

Automated Manual Transmissions (AMTs): Some 18-speed transmissions are automated, using sophisticated actuators and control systems to manage gear shifting. The 18-speed transmission diagram for an AMT includes components for the automated control system in addition to the gear arrangement.

1. Analyzing an 18-Speed Transmission Diagram: Key Components

A comprehensive 18-speed transmission diagram will illustrate the following key components:

Input Shaft: Receives power from the engine.

Countershaft: A secondary shaft with gears that mesh with gears on the input and output shafts to provide various gear ratios.

Output Shaft: Transmits power to the wheels or final drive.

Gear Sets: Pairs of gears with different sizes to achieve different gear ratios.

Synchronizers: Mechanisms that ensure smooth gear shifting by matching the speeds of engaging gears.

Shift Forks and Rails: Mechanical components that move the shift forks to engage the desired gear.

(For AMTs) Actuators and Control System: Electronic components controlling the gear shifting process.

1. Advantages and Disadvantages of 18-Speed Transmissions

Advantages:

Improved Fuel Efficiency: The wide range of gear ratios allows the engine to operate at its optimal RPM range for various loads and speeds, resulting in better fuel economy.

Increased Pulling Power: Lower gears provide higher torque, enabling the vehicle to handle heavy loads more effectively.

Reduced Engine Wear: Maintaining the engine in its optimal RPM range reduces stress and wear.

Enhanced Gradeability: The availability of numerous low gears significantly improves the ability to climb steep inclines.

Disadvantages:

Increased Complexity: 18-speed transmissions are significantly more complex than simpler

transmissions, leading to higher manufacturing costs and potentially more maintenance requirements.

Higher Initial Cost: The intricate design and manufacturing process contribute to a higher initial purchase price.

Increased Weight: The complexity of the transmission generally results in a heavier unit.

Potential for Higher Repair Costs: Repairing a complex 18-speed transmission can be more expensive and time-consuming than repairing a simpler transmission.

1. Applications of 18-Speed Transmissions

18-speed transmissions are primarily found in heavy-duty vehicles where their advantages outweigh their drawbacks. This includes:

Long-Haul Trucking: Optimizing fuel efficiency and pulling power is crucial for long-distance haulage.

Heavy Construction Equipment: Moving heavy loads and operating in challenging terrain necessitate the high torque and wide gear range offered by an 18-speed transmission.

Off-Road Vehicles: Similar to construction equipment, the robust design and wide gear ratios are beneficial in demanding off-road environments.

1. Future Trends in 18-Speed Transmission Technology

Ongoing advancements in materials science, manufacturing techniques, and control systems are expected to improve the efficiency, durability, and cost-effectiveness of 18-speed transmissions. Research into automated and electronically controlled shifting systems continues to refine the driver experience and optimize performance.

1. Conclusion

The 18-speed transmission represents a significant advancement in powertrain technology, particularly for heavy-duty applications. Understanding an 18-speed transmission diagram is essential for anyone working with or studying these sophisticated systems. While complexity and cost are factors, the benefits in fuel efficiency, pulling power, and engine longevity make them a valuable asset in specific vehicle applications. Continued research and development are likely to further enhance their performance and broaden their use cases in the future.

Frequently Asked Questions (FAQs)

1. What is the difference between an 18-speed and a 10-speed transmission? The key difference lies in the number of gear ratios available. An 18-speed transmission offers a much wider range of ratios, providing finer control over engine speed and torque, particularly beneficial for heavy loads and varying terrain.
1. How does an 18-speed transmission improve fuel economy? The wider gear ratio range allows the engine to operate closer to its optimal RPM, reducing fuel consumption.
1. Are 18-speed transmissions more difficult to maintain? Yes, due to their increased complexity, maintenance and repairs can be more challenging and potentially more expensive.
1. What types of vehicles typically use 18-speed transmissions? Primarily heavy-duty trucks, construction equipment, and some off-road vehicles.
1. How does an automated 18-speed transmission work? Automated systems use actuators and electronic controls to manage gear shifting, eliminating the need for a manual clutch and gearshift lever.
1. What are the common problems associated with 18-speed transmissions? Potential issues include synchronizer wear, gear wear, and problems with the control system (in automated transmissions).
1. How long does it take to learn how to operate an 18-speed manual transmission? Significant practice and training are required; it's not something that can be learned quickly.
1. What are the environmental benefits of using an 18-speed transmission? Improved fuel efficiency directly translates to reduced greenhouse gas emissions.
1. What is the future of 18-speed transmission technology? Further advancements in automation, materials, and control systems will likely lead to improved efficiency, durability, and lower

costs.

Related Articles:

1. "Understanding Gear Ratio Selection in Heavy-Duty Transmissions": This article explores the principles behind gear ratio selection and their impact on vehicle performance.
1. "The Evolution of Heavy-Duty Transmission Technology": A historical overview of advancements in heavy-duty transmission design.
1. "Maintenance and Repair of 18-Speed Transmissions": A practical guide to the maintenance and troubleshooting of 18-speed transmissions.
1. "Automated Manual Transmissions: Technology and Applications": A deep dive into the technology behind automated manual transmissions.
1. "The Impact of Transmission Technology on Fuel Efficiency": An analysis of how different transmission types influence fuel consumption.
1. "Comparative Analysis of 10-Speed, 13-Speed, and 18-Speed Transmissions": A comparative study of different transmission options for heavy-duty vehicles.
1. "Case Study: Performance Optimization of an 18-Speed Transmission in Long-Haul Trucking": A real-world example of the benefits of an 18-speed transmission.
1. "Advanced Materials in Heavy-Duty Transmission Design": Focuses on the role of materials science in improving transmission durability and efficiency.

1. "The Future of Powertrain Technology: Electrification and its Impact on Transmissions":
Explores the potential impact of electric vehicles on the future of transmission technology, including 18-speed and other advanced designs.

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helicopter TB 1-2840-256-20-03 Retirement change and time change limits update for t703-ad-700 700b engines on all OH-58d(i) Kiowa Warrior helicopters TM1-1520-248-MTF Maintenance test flight, Army OH-58d Kiowa Warrior Helicopter TM1-1520-248-10 Operators manual Army OH-58d Kiowa Warrior Helicopter TM1-1520-248-CL Technical manual, operators and crewmembers checklist, Army OH-58d Kiowa Warrior Helicopter TB 1-1520-248-20-47 One time inspection and repair of support installation, oil cooler, p/n 406-030-117-125/129, on OH-58d Kiowa Warrior Helicopter TM1-1520-248-23-7 Technical manual aviation unit and intermediate maintenance Manual for Army model OH-58d Kiowa Warrior Helicopter TM1-1520-248-23-6 Aviation unit and intermediate maintenance manual for Army model for OH-58d Kiowa Warrior Helicopter TM1-1520-248-23-5 Aviation unit and intermediate maintenance manual for Army model for OH-58d Kiowa Warrior Helicopter TM1-1520-248-23-4 Aviation unit and intermediate maintenance manual for Army mode OH-58d Kiowa Warrior Helicopters TM1-1520-248-23-3 Aviation unit and intermediate maintenance manual for Army model OH-58d Kiowa Warrior Helicopter TM1-1520-248-23-2 Aviation unit and intermediate maintenance manual for Army model OH-58d Kiowa Warrior Helicopter TM1-1520-248-23-1 Aviation unit and intermediate maintenance manual for Army model OH-58d Kiowa Warrior Helicopter TM1-1520-248-T-1 Operational checks and maintenance action precise symptoms (maps) diagrams Manual for Army model OH-58d Kiowa Warrior Helicopter TM1-1520-248-T-2 Operational checks and maintenance action precise symptoms (maps) diagrams Manual for Army model OH-58d Kiowa Warrior Helicopter TM1-1520-248-T-3 Operational checks and maintenance action precise symptoms (maps) diagrams Manual for Army model OH-58d Kiowa Warrior Helicopter TB 1-1520-248-20-48 Inspection of oil cooler support installation and oil cooler fan TB 1-2840-263-01 One time inspection and recurring inspection of new self sealing magnetic chip detectors OH-58d(r) Kiowa Warrior Helicopter engines TB 1-1520-248-20-52 Aviation Safety Action For All OH-58D Series Aircraft False Engine Out Warnings TB 1-1520-248-20-51 One time inspection for directional control tube chafing all OH-58d Kiowa Warrior Helicopters TB 1-1520-248-20-53 Maintenance mandatory hydraulic fluid sampling for all OH-58d Kiowa Warrior Helicopters TB 1-1520-248-20-54 One time inspection for incorrect fasteners in center post assembly all OH-58d aircraft TB 1-1520-248-20-55 Initial and recurring inspection of t703-ad-700b engine for specification power, compressor stall, and instability during power transients TB 1-1520-248-20-56 One time inspection for hydraulic relief valve p/n 206-076-036-101 on all OH-58d Kiowa Warrior Helicopters TB 1-2840-263-20-02 One time inspection of scroll assembly on 250-c30r/3 engine for OH-58d aircraft TB 1-2840-256-20-04 One time inspection of scroll assembly on t703-ad-700 and t703-ad-700a engines for OH-58d aircraft TB 1-1520-228-20-85 All OH-58 aircraft, one time inspection of magnetic brake TB 1-1520-248-20-58 Initial and recurring inspection of forward tail boom intercostal assembly and aft fuselage frame assembly TB 1-1520-248-20-59 One time inspection for discrepant bell Kiowa Warrior Helicopter textron parts all OH-58d aircraft TB 1-1520-248-20-63 Replacement of ma-6/8 crew seat inertia reel all OH-58d Kiowa Warrior Helicopters TB 1-1520-248-20-65 Inspection and overhaul interval change for engine to transmission driveshaft all OH-58d Kiowa Warrior Helicopters

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steps aren't as clear as they could be. So follow along as we tear into a T-84J transmission...you can do it!

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Additional Resources

Eaton Fuller Heavy-Duty Transmissions TRDR0800 EN-US

18-Speed Models Models in this series provide eighteen forward speeds and four reverse, consisting of a five-speed front section and a 4-speed auxiliary section. The auxiliary section ...

Eaton-Fuller RTLO-18918B Transmission Parts Manual - Pro ...

This is Eaton Fuller RTLO-18918B Transmission parts manual brought to you by Pro Gear and Transmission to assist you identifying the parts for your Eaton / Fuller transmission unit.

RTLO-16718B July 2011 - eprogear.com

Illustrations show parts in assembly groups. Item numbers on illustrations correspond with parts listings on pages adjacent to the illustration. Notes are included on illustrations where ...

18 Speed - partsmanuals.org

How to shift the Spicer PRO-Shift 18 Speed Transmission Fig. 1 Starting vehicle from a stop 1. (a) With the gear shift lever in neutral, (b) Clutch pedal depressed, (c) And brakes set, (d) Start the ...

PRO-SHIFT 18-Speed Parts Catalog

for medium-duty, heavy-duty, and vocational applications offer an exceptionally wide range of high torque-to-weight ratios. EASY-SHIFT™ Transmissions... for medium-duty trucks, quietly ...

BROUGHT TO YOU BY PRO GEAR & TRANSMISSION.

The T-318L21 is the transmission of choice for maximum performance with a high output engine requiring a 2100 Lb. Ft. rating. This model features a heavier output shaft, premium bearings, ...

The Low-Inertia™ Super 18 - Eaton

0.73 and 0.86 overdrives for efficient cruise RPMs. Smoother, faster, easier shifting due to patented low-inertia technology. Exclusive output seal design improves seal life and eliminates ...

Eaton-Fuller RTLO-18918B-AS Transmission service manual

This is the Pro Gear's Eaton Fuller RTLO-18918B-AS Transmission service manual to assist you servicing your Eaton / Fuller transmission unit. If you need any assistance identifying the ...

CE 18-Speed - WELLER TRUCK

Used correctly, this checklist identifies transmission issues and aids in tracking the problem until corrected. A separate checklist should be filled out for each vehicle built with a C.E. 18-Speed. ...

PRO-SHIFT 18-Speed Parts Catalog - tremec.com

for medium-duty, heavy-duty, and vocational applications offer an exceptionally wide range of high torque-to-weight ratios. EASY-SHIFT™ Transmissions... for medium-duty trucks, quietly ...

Fuller Heavy Duty Transmissions TRSM0880 - Eaton

This manual is designed to provide detailed information necessary to service and repair the Fuller' Transmissions listed on the cover. Options The format of the manual is designed to be followed ...

RTLO-16918B July 2011 - e Pro Gear

Illustrations show parts in assembly groups. Item numbers on illustrations correspond with parts listings on pages adjacent to the illustration. Notes are included on illustrations where ...

Eaton-Fuller RTLO-18718B Transmission Parts Manual - Pro ...

This is Eaton Fuller RTLO-18718B Transmission parts manual brought to you by Pro Gear and Transmission to assist you identifying the parts for your Eaton / Fuller transmission unit.

Fuller Heavy-Duty Transmissions TRTS0011 EN-US - Parts ...

Before working on a vehicle or leaving the cab with engine run-ning, place the transmission in neutral, set the parking brakes, AND block the wheels. Do not release the parking brake or ...

Illustrated Parts List - Eaton

Mar 1, 1999 · FLEX Reman Transmission Reman Transmission AFTMKT 08-12 Generic Illustration - Not specific to part numbers listed below. 5 Group: AIR MODULE & RANGE CYL. ...

Eaton Fuller Automated Transmissions - WELLER TRUCK

The "MT" 18-speed is an Eaton® Fuller® 18-speed Roadranger® transmission that uses a converter to multiply torque. The 18-speed transmission has eighteen forward speeds and four ...

Eaton Fuller Heavy-Duty Transmissions TRIG0070

All Top 2 transmission systems installed at OEM facilities must meet the requirements for standard manual Eaton Fuller Transmissions outlined in Form FUL-169 and be approved using ...

Illustrated Parts List - Eaton

Parts listings are defined by parts groupings and are broken down by service assemblies. Parts listings identify a part for servicing with the following categories. Item Number - corresponding ...

Illustrated Parts List - Eaton

Reman Transmission AFTMKT 09-12 Generic Illustration - Not specific to part numbers listed below. 5 Group: AUXILIARY DRIVE GEAR AUXILIARY DRIVE GEAR Item Current ... 18 ...

Eaton-Fuller RTO-14908LL Transmission Parts Manual - Pro ...

Eaton Fuller RTO-14908LL Transmission Parts Manual ... 23 K-3454 SPEED SENSOR KIT A - 6398 ,A - 6724 1 SINGLE PICK-UP (2 PIN) 23 K-3455 SPEED SENSOR KIT, DUAL ... 18 ...

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Illustrated Parts List

18 19 10412-6-94 Aux Case OEM supplied non-adjustable speedometer sensor OEM supplied adjustable Note — Items 7 & 8 / Magnetic Speedometer Openings: Use 13679 "O" ring w/ ...

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18 Speed Transmission Diagram United States. Department of the Air Force. 18 Speed Transmission Diagram: A Heavy Duty 18 Speed Transmission John R. Vandervoort,Society of ...

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RTOF-16908LL July 2011 - Eaton

23 k-3454 speed sensor kit a - 6398 ,a - 6724 1 single pick-up (2 pin) 23 k-3455 speed sensor kit, dual a - 7046 ,a - 7518 1 dual pick-up (4 pin) 24 7992 bushing 1 s-2502,s-2859 25 14142 -o- ...

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PRO-SHIFT-18-Speed Transmission Section I General Information ... AIR LINE PIPING DIAGRAM. 9 Filter Regulator The 18 speed uses a filter regulator preset at 50-55 lbs. Use ...

Last mack manual transmission

are conversions for power, fuel performance, velocity, and volume flow. The text also includes visual identification information for the transmission unit, including a diagram of the unit's ...

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The 18-speed transmission has eighteen forward speeds and four reverse, consisting of a five-speed front section and a 2 x 2 speed auxiliary section. The auxiliary section contains LO and ...

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18-speed Valve Location Note: Refer to "Transmission Mounting Requirements" for Valve Spatial Requirements. MODEL LENGTH "A" LENGTH "B" LENGTH "C"

Illustrated Parts List - Eaton

18 8677 BUSHING 1 FOR #2 HOUSING - UPPER A-3713,A-3723,A-4772,A-6064 . 6 Item Current Part Description Replaced Part Qty. Notes Kits/Assys Where Needed 19 8677 ...

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EEO-14F112C Yes1 42T 3.156 MODULE, 20DEG PA, 28.9747 DEG H.A. LEFT HAND 137% ...

gen2 wiring schematics - □□□□□□□□

10-Speed AutoShift Wiring Diagram 10-Speed AutoShift Wiring Diagram F1 F2 F3 J1 J3 J2 K2 K3 K1 G1 G2 G3 Terminating resistor J-1939/11 data link (OEM supplied) Battery + _ Shield ...

Eaton Heavy-duty clutch selector chart

Clutch for Automated Transmission Kit Part No. 1850 122002-35A (w/ Low Capacity Inertia Brake) 122002-35MO (Remanufactured UltraShift PLUS Clutch w/o Low Capacity Inertia Brake) 2250 ...

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Eaton Truck Components Bulletin TRIB-9707

New Knob Old Knob Part Number with New Knob with Shift Medallion and Air Fittings Transmission Models Part Number Generic Medallion (Medium duty 5, 6, and 7 speeds have ...

Illustrated Parts List - Eaton

6 Item Current Part Description Replaced Part Qty. Notes Kits/Assys Where Needed 3 K-2918 OIL SEAL KIT 4302322 4302323 1 "FOR MAGNETIC COVER" K-3339,K-3340,K-

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remanufactured 13, 15, and 18 speed model Eaton Fuller transmissions, enables to get you back on the road faster. We stock and recommend genuine Eaton Fuller parts, from Eaton's ...

Eaton Fuller 13 Speed Transmission Air Line Diagram

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MTM transmission air supply pressure sensor repair - Eaton ...

PACCAR TX -18/Pro A-10004258 PS-490 . Special Instructions: • Procedure can be performed with transmission in-chassis • Drain vehicle air system/tanks and MTM air supply line to MTM ...

13-Speed Transmissions RT-13 - Eaton

18 17 19 17 37 38 40 42 41 Low Inertia Concept: This innovative, patented design is identified in the Eaton Fuller nomenclature by the letter "L" (as in RTLO-16913A). These transmissions ...

Illustrated Parts List - Canada-Wide Parts

7 Item Current Part Description Replaced Part Qty. Notes Kits/Assys Where Needed 3 K-2918 OIL SEAL KIT 4302322 4302323 1 "FOR MAGNETIC COVER" K-3339,K-3340,K-

GENERAL MOTORS MUNCIE 4-SPEED MANUAL ...

4-SPEED MANUAL TRANSMISSION ASSEMBLIES, GEARS & PARTS APPLICATIONS: GENERAL MOTORS 1963-1974 GENERAL MOTORS (HIGH PERFORMANCE) AUTO ...

Eaton-Fuller RT-8908LL Transmission Parts Manual - Pro ...

18 12815 BUSHING 4 FOR #1 HOUSING UPPER A-3713,A-6064,K-2468 18 12815 BUSHING 2 FOR #2 HOUSING UPPER A-3713,A-6064,K-2468 18 8677 BUSHING 1 FOR #2 HOUSING ...

Fuller Medium Heavy Transmissions TRSM0226 - Eaton

Six forward speeds are obtained with a 3-speed section and a 2-speed range or auxiliary section. The 3 speeds of the ... The range shift air cylinder is built into the transmission. The RT-906 ...

18 Speed Transmission Diagram Copy - www2.x-plane.com

The 18-speed transmission diagram for this type is complex, illustrating the intricate meshing of gears between the different shafts. Automated Manual Transmissions (AMTs): Some 18 ...

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RTLO-18918B-AS July 2011 - Parts Manuals

6 Item Current Part Description Replaced Part Qty. Notes Kits/Assys Where Needed ASSY ,4304652 ,4305830 PICK-UP 6 1009551 GASKET - RED EDGE

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I. This transmission contains NO LUBRICANTS. Fill with OEM approved lubricants. II. DO NOT OVER-TORQUE THE BELL STUDS ON INSTALLATION. DAMAGED BELL STUDS MAY ...

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Eaton Fuller heavy-duty transmissions driver instructions ...

DO NOT REMOVE OR DESTROY THE TRANSMISSION IDENTIFICATION TAG. Transmission model designation and other transmission identification information are stamped on the ...

TMIB-0158 - Eaton

Jan 8, 2010 · engine codes, J-1939, ABS or any other Output speed related code. Resolve any of these codes prior to looking at the speed sensor. (Non Eaton Warranty repair) 2) Inspect ...

For the most current information, visit the Roadranger web ...

7 Group: CASE (AUX) 6 9 10 11 OEM supplied non-adjustable speedometer sensor (Non-Threaded) adjustable (Threaded) 10419-2-97 5 4 7 3 2 1 14 23 25 Magnetic 26 22 21

Illustrated Parts List - Eaton

Reman Transmission AFTMKT 09-12 Generic Illustration - Not specific to part numbers listed below. 5 Group: AUXILIARY DRIVE GEAR AUXILIARY DRIVE GEAR Item Current ... 18 ...

FOR ALL 6-BOLT AND 8-BOLT MOUNT SERIES PTOS

transmission gear selection. If the gear does not come to a complete stop . within a few seconds, the clutch linkage on the truck must be adjusted before installing the PTO. Run transmission in ...

RTO-15618 July 2011 - Eaton

18 12815 bushing 2 for #2 housing upper a-3713,a-3723,k-2468 18 12815 bushing 4 for #1 housing upper a-3713,a-3723,k-2468 18 8677 bushing 1 for #2 housing upper a-3713,a-3723 ...

Service Bulletin Product - Eaton

Dec 3, 2018 · Service Bulletin – Product Page 1 of 3 Subject: Transmission Main Case – Oil Cooler Port Thread Change Document Number: TAIB0864 Date: June 12, 2017 Updated: ...

Maintenance Manual MM-99106 9- and 10-Speed ...

Wiring Diagram (Wiring Diagram TP-9964) 9- and 10-Speed Manual Transmissions (Operator Manual TP-8989) 9-, 10- and 13-Speed Transmissions (Parts Book PB-94134) TM ...

Fuller Heavy-Duty Transmissions TRSM0670 EN-US - e Pro Gear

Before starting a vehicle always be seated in the Driver's Seat, place the Transmission in Neutral, set the Parking Brakes and disengage the Clutch. ... Conversion of a 13-Speed to an 18 ...

18 Speed Transmission Diagram

18 Speed Transmission Diagram

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