

Allison Transmission Mt654 Repair Manual

Allison Transmission Mt654 Repair Manual Allison Transmission MT654 Repair Manual This manual provides comprehensive information for repairing and maintaining the Allison MT654 transmission. The MT654 is a robust and reliable automatic transmission designed for heavyduty applications. Understanding the intricacies of its design and operation is crucial for ensuring optimal performance and longevity.

1 Overview of the MT654 Transmission

The MT654 is a sixspeed fully automatic transmission with a torque converter and electronic controls. It is a popular choice for mediumduty trucks, buses, and specialized vehicles.

Key Features

- Durable Construction:** Utilizes heavyduty components for increased durability and long service life.
- Smooth Shifting:** Electronic controls ensure smooth and efficient gear changes.
- High Torque Capacity:** Designed to handle high torque output from diesel engines.
- Multiple Operating Modes:** Offers different operating modes to optimize performance for various applications.

Applications

The MT654 is suitable for Mediumduty trucks, Buses, Refuse trucks, Fire trucks, Construction equipment, and Other heavyduty vehicles.

2 Transmission Components

- Torque Converter:** Transfers engine power to the transmission while providing torque multiplication and smooth engagement.
- Clutch Packs:** Responsible for engaging and disengaging gears within the transmission.
- Gear Train:** Consists of various gears that transmit power to the output shaft and provide different gear ratios.
- Hydraulic System:** Provides pressure for clutch actuation, gear selection, and cooling.
- Electronic Control Unit (ECU):** Monitors and controls the transmissions operation based on 2 inputs from various sensors.

Sensors

Sensors measure various parameters like engine speed, vehicle speed, transmission fluid temperature, and hydraulic pressure.

3 Operating Principles

- Gear Selection:** The ECU determines the optimal gear based on vehicle speed, engine load, and other factors.
- Clutch Actuation:** The ECU controls hydraulic pressure to engage and disengage clutch packs, selecting the appropriate gear.
- Torque Converter Lockup:** When operating at higher speeds, the torque converter locks up, eliminating slip and improving fuel efficiency.
- Shift Scheduling:** The transmission uses a sophisticated shift

scheduling system to optimize performance and minimize wear and tear

4 Troubleshooting and Diagnosis

Common Problems Transmission slipping Harsh shifting Transmission fluid leaks Electrical faults Transmission overheating Diagnostic Tools Allison Electronic Technician AET Scan tools Pressure gauges Temperature gauges Leak detection equipment Troubleshooting Steps Gather information about the symptoms vehicle history and operating conditions Inspect for fluid leaks damaged components and loose connections Use diagnostic tools to retrieve fault codes and monitor sensor readings Perform functional tests to verify transmission operation Analyze data and pinpoint the root cause of the problem

5 Repair Procedures

Preparation Disconnect battery and remove transmission

3 Ensure proper workspace tools and safety equipment

Follow all safety precautions outlined in the manual Fluid and Filter Replacement Use Allison approved transmission fluid Replace filters and seals as needed Clutch Pack Replacement Inspect clutch packs for wear damage or contamination Replace clutch packs as needed ensuring correct installation Gear Train Inspection Inspect gears for wear damage or misalignment Replace damaged gears or rebuild the gear train Hydraulic System Inspection Inspect hydraulic system components for leaks blockages or damage Replace or repair damaged components Electronic Control Unit ECU Diagnosis Inspect ECU for damage or malfunction Use diagnostic tools to test ECU operation Replace ECU if necessary Reassembly and Testing Reassemble transmission components carefully Fill transmission with fluid and check for leaks Test transmission operation before installing it in the vehicle

6 Maintenance Schedule

Regular Maintenance Check transmission fluid level and condition at regular intervals Replace transmission fluid and filter according to manufacturers recommendations Inspect external components for damage or leaks Preventive Maintenance Perform inspections and fluid changes more frequently in harsh operating conditions Replace worn or damaged components before they cause major problems

7 Safety Precautions

Safety Glasses Wear safety glasses to protect your eyes from flying debris Gloves Wear gloves to protect your hands from sharp edges and hot components Proper Lifting Techniques Use proper lifting techniques to avoid injury Fire Extinguisher Keep a fire extinguisher nearby

4 Electrical Safety

Disconnect battery before working on electrical components Fluid Handling Handle transmission fluid carefully to avoid contamination

8 Technical Specifications

Model MT654 Gear Ratios 6 speeds Torque Capacity varies depending on

engine Fluid Type Allison TES295 or equivalent Fluid Capacity varies depending on application 9
 Warranty Information Warranty Coverage Consult the manufacturers warranty information for
 details on coverage and limitations Warranty Claims Follow the manufacturers procedures for
 filing warranty claims Conclusion The Allison MT654 transmission is a highperformance and
 durable component that requires proper maintenance and repair procedures to ensure optimal
 performance This manual provides essential information for technicians to diagnose repair and
 maintain the MT654 transmission ensuring its longevity and reliability By following the
 instructions and safety precautions outlined in this manual you can ensure the safe and
 efficient operation of your vehicle

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