

# **What's New With Allison**

**Russell Schwamb  
Allison**

Presented to the

Institute of Road Transport Engineers of New Zealand

**SEVENTH INTERNATIONAL HEAVY VEHICLE SEMINAR**

**WELLINGTON**

**16 & 17 July 1998**

# **Engineering and Application Of Allison Automatics**

**David E. Neuffer  
Director Asia Pacific  
Engineering**



**Allison Transmission  
Asia-Pacific Region**

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- *All We Do* is Design, Manufacture and Support Heavy Duty Automatic Transmissions
- We have been Manufacturing Heavy Duty Automatic Transmissions for 50 Years
- We Manufacture By Far More Than All Other Automatic Suppliers Combined



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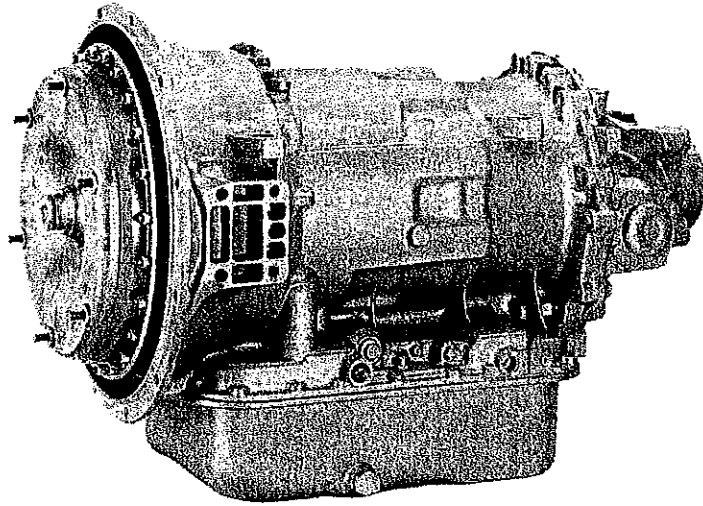
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**NEW ZEALAND**

**AND THE ALLISON AUTOMATIC ADVANTAGE**

# Allison MT 643 Transmission...



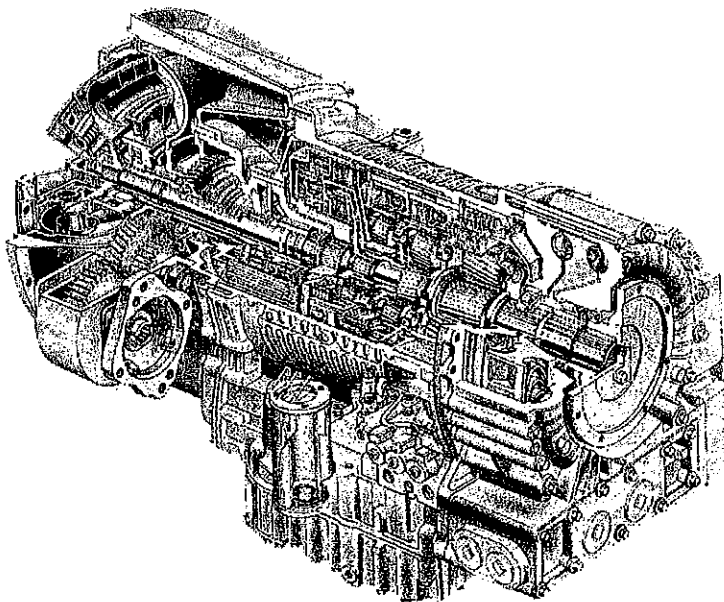
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**NEW ZEALAND**

**AND THE ALLISON AUTOMATIC ADVANTAGE**

# Or, Allison World Transmission



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## **What Created the Need?**

- ✓ **Engine Lugging and Overspeeds by Missed Shifts**
- ✓ **Driveline and Axle Failures and Lost Production**
- ✓ **Operator Fatigue Resulting in Irregular Shifting Patterns, Longer Cycle Times, and Operator Turnover**
- ✓ **Equipment Investment Protection Required**



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## **The Logic For Automatics**

- ✓ **Automatics are used in the MOST DEMANDING duty vehicle vocations over all others:**
- ✓ **Mining Trucks**
- ✓ **Oil Field Equipment**
- ✓ **Refuse Trucks**
- ✓ **Military Tanks, Transports**
- ✓ **Fire Apparatus**

**Because the Benefits are Most Easily  
Recognized in These Demanding Vocations**



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## Components of Automatics

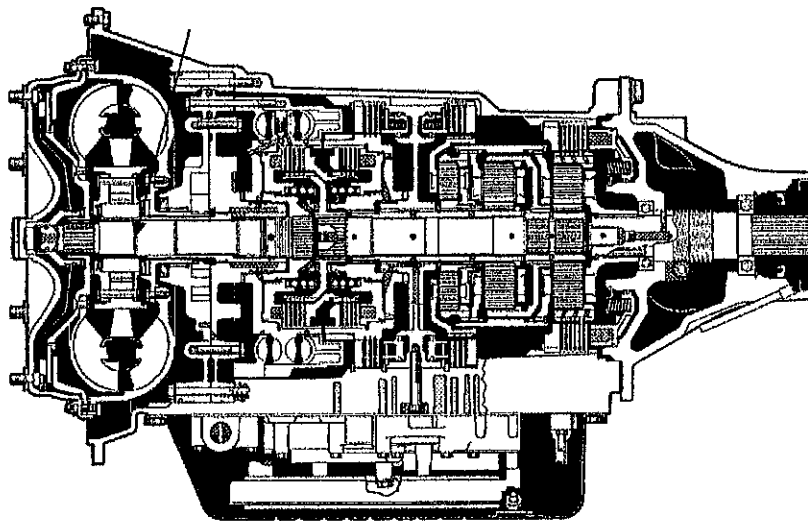
- ✓ Hydraulic Torque Converter Incorporating a Fluid Coupling and Torque Multiplication Capability
- ✓ Planetary Gears for Distribution of Forces In-Line, to Reduce Space Claim, and for Broad Range of Ratios
- ✓ Multiple Plate Wet-Disk Clutches to Shift Ranges
- ✓ A Controlling Mechanism to Change Ranges Automatically



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## Torque Converter



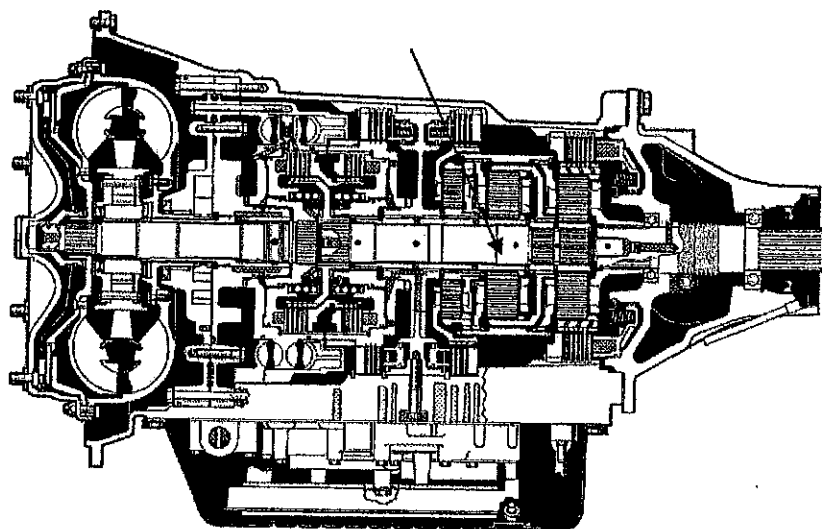
**The Allison torque converter optimizes wheel horsepower for startability, then locks up in higher ranges for efficiency.**



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## Gearing



**Allison are available from 4 to 7 speed ranges. Too many gear splits can cause wear from excessive shifting.**



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## Automatic Transmission Benefits

- ✓ **Reduced Operator Training - NOT Eliminated, but Significantly Reduced**
- ✓ **Operator Retention - Drivers Work Environment is Much Improved, Resulting in More Job Satisfaction, and Vehicles Better Cared For**
- ✓ **Shifts Occurring Within a Pre-Determined and Programmed "Schedule" - Less Operator Worry**



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## **Driver Benefits**

- ✓ **Higher Productivity**
- ✓ **Improved Safety**
- ✓ **Simplified Training**
- ✓ **Ease of Operation and Freedom to Concentrate**
- ✓ **Less Fatigue and Margin For Error**



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## **Benefits**

- ✓ **Lower Operating Costs**
- ✓ **Lower Maintenance Costs**
- ✓ **Reduced Driver Turnover**
- ✓ **Improved Productivity**
- ✓ **Reduced Training Expense**



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## **Benefits**

- ✓ **Greater Reliability and Durability**
- ✓ **Reduced Downtime**
- ✓ **Improved Performance**
- ✓ **Better Maneuverability**
- ✓ **Better Vehicle Control**



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## **Automatic Shifting Benefits**

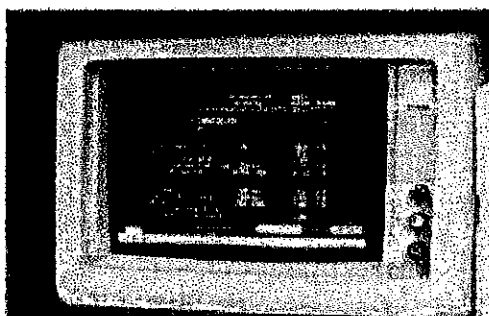
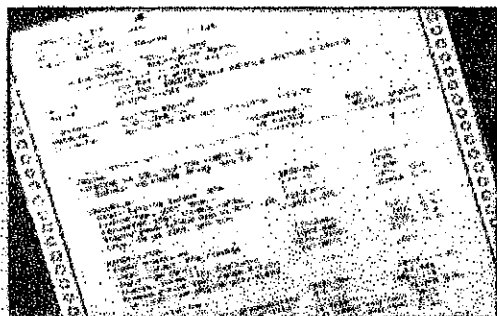
- ✓ **Through an Integral Automatic Shifting Mechanism, the Operator is Freed to Concern Himself with Production, Vehicle Control, and What is Important to the Site, While**
  - **Protecting the Vehicle, Engine and Drive Train**
  - **Far Reduced Arm and Leg Fatigue and Opportunity for Error**



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## SCAAN - System for Computerized Application Analysis



- ❑ Evaluating powertrain specs to ensure satisfactory vehicle performance
- ❑ Computing a wide variety of vehicle performance parameters



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## WT RETARDER

- ✓ **RETARDER: A Fluid Coupling in Line with the Transmission Shafting Which, When Flooded with Oil, "Retards" or Brakes the Vehicle by Absorption of Horsepower,**
- ✓ **- Controlling the Vehicle in Down Grade Haul**
- ✓ **- Reducing Brake Wear**
- ✓ **- Is a Non-Wearing Device**



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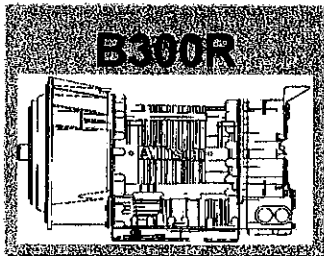
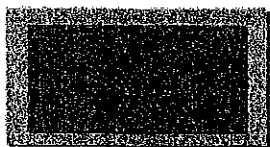
# World Transmission (WT) Series



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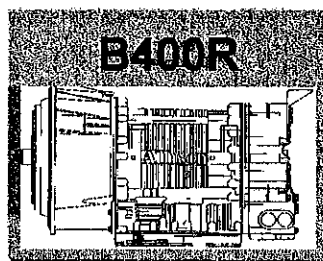
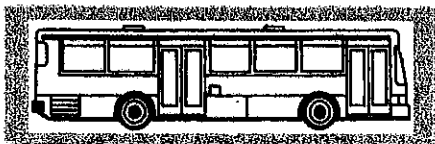
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## The World Transmission "WT" Bus Models



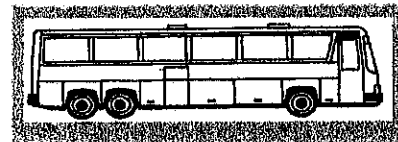
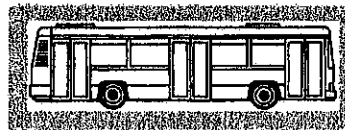
**B300R**

**B300 Series Medium Duty  
Diesel Engines  
Small Transit/Shuttle**

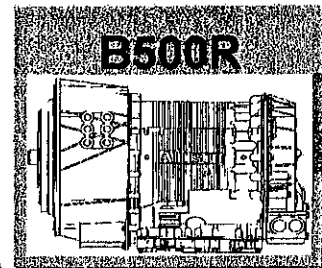


**B400R**

**B400 Series Mid-Range  
Diesel Engines Transit**



**B500 Series Heavy Duty  
Diesel Engines Intercity,  
Articulated Transit**



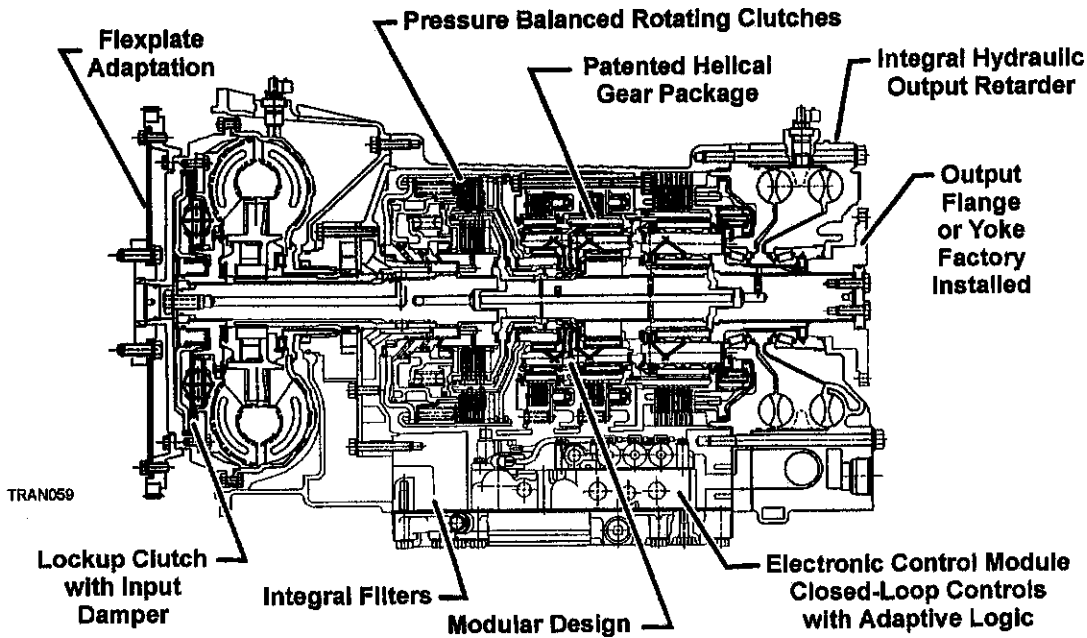
**B500R**



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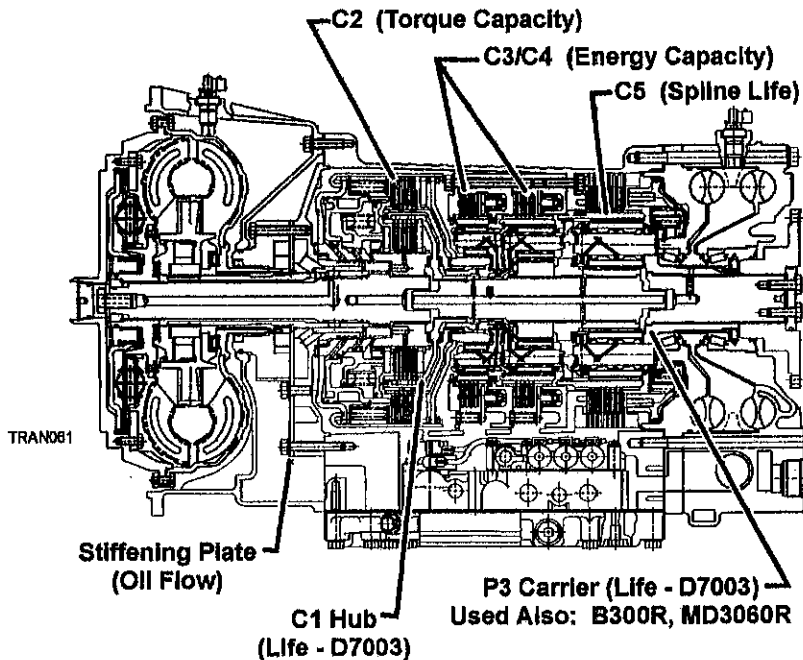
# World Transmission



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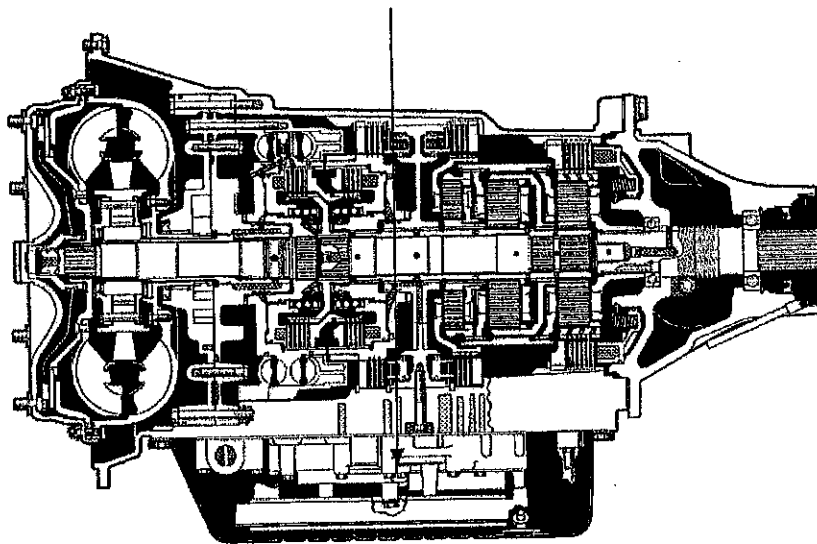
# B400R



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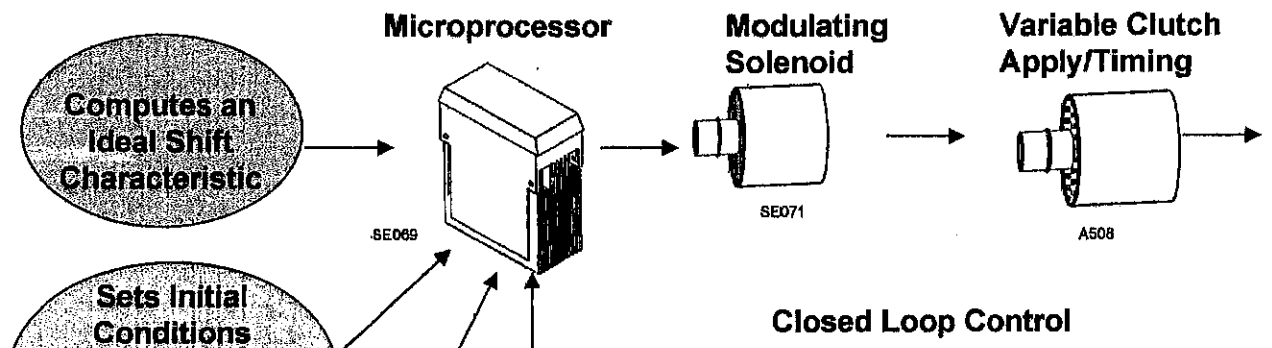
# From Hydraulic Controls.....



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# Second Generation Electronic Controls



**System Advantages:**

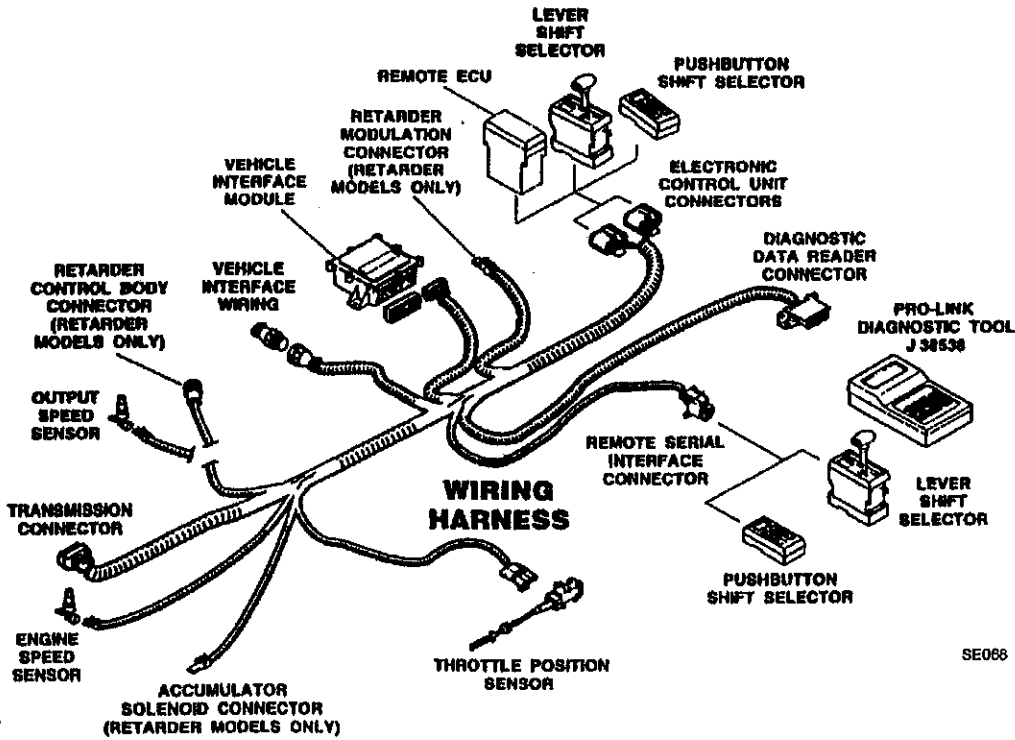
- Consistently Smooth Shifting by Self-Compensation for:
  - Manufacturing Tolerances
  - Wear or Leakage in Transmission
  - Changes in Engine Power and Vehicle Load
- Compatible with Engine Electronics
- Increased Vocational Flexibility
- Protection Against Abuse
- Improved Fuel Economy & Performance



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# B300R/B400R Electronic Control System



SE088



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## Summary of WT Benefits

- ✓ Greater Reliability and Durability
- ✓ Reduced Downtime
- ✓ Improved Performance
- ✓ Better Maneuverability
- ✓ Better Vehicle Control



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