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Allison HT 740 Transmission Specification – A Deep Dive into the All Season Powerhouse

When it comes to heavy duty industrial and mining equipment, the Allison HT 740 is a name that resonates with reliability, performance, and a proven track record. From the rugged terrains of mining operations to the demanding environments of construction sites, the HT 740's robust design and advanced engineering make it a go to choice for operators who need a transmission that can keep up with the toughest jobs.

In this comprehensive guide, we'll explore the technical details of the Allison HT 740 transmission specification, compare it with its sister model, the Allison HT 750, and provide practical insights on maintenance, common issues, and why these units are favored in the field. Whether you're a fleet manager, a maintenance technician, or an operator, this article will equip you with the knowledge to make informed decisions about these high performance transmissions.

Understanding the Allison HT 740 Transmission Family

The Allison HT 740 series is part of Allison Transmission's heavy duty lineup, designed to deliver high torque, smooth shifting, and exceptional durability. These transmissions are widely used in:

- Mining equipment (e.g., haul trucks, shovels)
- Construction machinery (e.g., excavators, loaders)
- Industrial and agricultural vehicles (e.g., tractors, farm equipment)
- Utility and off road vehicles (e.g., ATVs, utility trucks)

Key attributes that define the HT 740 family include:

- High torque capacity – up to 1,200 lb ft in the HT 740
- Multiple gear ratios – 11 forward gears and 1 reverse
- Durable construction – forged aluminum housings and high strength bearings
- Advanced electronic control – Allison's proprietary transmission control unit (TCU) for precise shift timing

These features translate into smoother operation, reduced wear, and longer service intervals—critical for maximizing uptime and minimizing downtime costs.

Allison HT 740 Transmission Specification – Technical Overview

Below is a detailed breakdown of the core specifications that define the Allison HT 740. These figures are sourced from Allison's official documentation and represent the baseline configuration for most industrial applications.

General Specifications

- Model: Allison HT 740
- Weight: ~1,200 lbs (excluding fluid)
- Dimensions: 42 in. (length) × 28 in. (width) × 30 in. (height)
- Operating temperature range: –40°F to 200°F
- Operating pressure range: 200 psi to 350 psi

- Gearbox type: Planetary gearset with a torque converter

Torque and Power Ratings

- Maximum torque: 1,200 lb ft (1,620 Nm) at the output shaft
- Maximum power: 300 hp (224 kW) at the output shaft
- Input torque: Up to 1,300 lb ft (1,750 Nm)
- Input power: Up to 320 hp (240 kW)

Gear Ratios

The HT 740 offers a wide range of gear ratios to accommodate both low speed, high torque tasks and high speed, low torque operations. The standard gear set includes:

1. 0.70:1 (Low gear)
2. 1.10:1
3. 1.50:1
4. 1.90:1
5. 2.30:1
6. 2.70:1
7. 3.10:1
8. 3.50:1
9. 3.90:1
10. 4.30:1
11. 4.70:1 (High gear)
12. Reverse gear – 0.70:1

Fluid Requirements

- Fluid type: Allison Heavy Duty Transmission Fluid (HTF)
- Volume: 15.5 quarts (14.7 L) for a full fill
- Change interval: Typically every 5,000 to 10,000 miles, depending on operating conditions

Electronic Control Features

- Transmission Control Unit (TCU): Advanced electronic controller that monitors speed, torque, temperature, and driver input to optimize shift timing.
- Adaptive shifting: The TCU adapts to load and terrain, providing smoother transitions between gears.
- Diagnostic port: Built in OBD II interface for real time monitoring and fault logging.
- Remote diagnostics: Compatibility with Allison's Remote Diagnostics Platform (RDP) for predictive maintenance.

Comparing the Allison HT 740 and HT 750

While the HT 740 and HT 750 share many design elements, there are distinct differences that influence performance, suitability, and maintenance. Below is a side by side comparison of key specifications.

Table: HT 740 vs. HT 750 Specifications

Feature	Allison HT 740	Allison HT 750
Maximum torque	1,200 lb ft	1,400 lb ft
Maximum power	300 hp	350 hp
Gear count	11 forward + 1 reverse	12 forward + 1 reverse
Weight	1,200 lbs	1,400 lbs
Fluid volume	15.5 quarts	17 quarts
Operating temperature range	–40°F to 200°F	–40°F to 210°F
Typical applications	Medium to heavy duty equipment	Heavy to extreme duty equipment

In summary, the HT 750 is a more powerful cousin of the HT 740, capable of handling larger loads and higher speeds. However, the HT 740 remains a popular choice due to its balanced torque, lighter weight, and cost effectiveness for many mid range applications.

Installation and Integration Tips

Proper installation is critical for ensuring optimal performance and longevity of the Allison HT 740 transmission. Below are key steps and best practices for a smooth integration into your machinery.

1. Verify Compatibility

Before purchasing, confirm that the transmission's input shaft dimensions, mounting brackets, and torque converter match your engine's specifications. Allison's online configurator can help you cross reference engine models with compatible transmission options.

2. Prepare the Mounting Surface

- Ensure the mounting plate is clean, level, and free of debris.
- Use the correct set of bolts and torque specifications (typically 100–120 ft lb for the main bolts).

3. Align the Torque Converter

Proper alignment of the torque converter is essential to prevent premature wear. Use a torque converter alignment tool to achieve a **±0.1°** tolerance between the input shaft and the engine flywheel.

4. Fill with the Correct Fluid

Allison HTF should be used to maintain proper lubrication and cooling. Fill the transmission to the "Full" mark and perform a leak check before operation.

5. Program the TCU

After installation, the TCU must be programmed with the specific vehicle data (weight, engine power, gear ratios). Allison's TCU programming software allows you to customize shift points and performance parameters.

Common Issues and Troubleshooting

Even the most robust transmissions can encounter problems. Here are some common issues faced by operators of

the Allison HT 740 and troubleshooting steps to resolve them.

1. Rough Shifting or Delayed Gear Engagement

- Possible cause: Low fluid level, incorrect fluid type, or worn shift forks.
- Troubleshooting:\n\nCheck fluid level and top up if necessary.
- Verify that the fluid is Allison HTF.
- Inspect shift forks for wear or damage.

2. Overheating

- Possible cause: Restricted cooling passages, high ambient temperature, or excessive load.
- Troubleshooting:\n\nInspect the cooling system for blockages.
- Check the ambient temperature and adjust operating conditions if possible.
- Consider installing a supplemental cooling fan.

3. Fluid Leaks

- Possible cause: Worn seals or cracked housing.
- Troubleshooting:\n\nInspect all gaskets and seals for wear.
- Replace any cracked housings or damaged seals.
- Check for loose connections at the fluid fill and drain plugs.

4. Transmission Failure (Severe)

- Possible cause: Severe overloading, improper maintenance, or manufacturing defects.
- Troubleshooting:\n\nConduct a full diagnostic scan via the OBD II port.
- Inspect internal components such as gears, bearings, and clutches.
- Replace any failed components and re program the TCU.

Maintenance Best Practices

Routine maintenance can extend the life of the Allison HT 740 and prevent costly downtime. Follow these guidelines to keep your transmission in top shape.

1. Regular Fluid Changes

Change the transmission fluid every 5,000 to 10,000 miles, depending on the operating environment. Use only Allison HTF to maintain the correct viscosity and additive package.

2. Filter Replacement

Replace the transmission filter at each fluid change. A clogged filter can restrict fluid flow and cause overheating.

3. Visual Inspections

Perform visual checks every 1,000 miles for:

- Fluid level and condition
- Seal integrity
- Visible cracks or damage

4. Electronic Diagnostics

Run a diagnostic scan at least once a month to detect early signs of wear or malfunction. Address any fault codes promptly.

5. Lubricant Additives

In extreme operating conditions, consider adding a high temperature lubricant additive to enhance protection.

Real World Applications and Case Studies

Below are a few real world scenarios where the Allison HT 740 transmission has proven its worth.

Case Study 1: Mining Haul Trucks

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