



For Preview Only

Service Manual

**4000 MH / HD 4000 / B 500 Series
On-Highway Transmissions**

SM2457EN

Service Manual

Allison Transmission

4000 MH

HD 4060, 4060P, 4060R, 4060PR

HD 4560, 4560P, 4560R, 4560PR

HD 4070/4076

B 500, B 500P, B 500R, B 500PR

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INTRODUCTION

ELECTRONIC CONTROL UNIT AND DIAGNOSTIC DATA READER/TOOL DISPLAYS AND BUTTON NAMES

Shift Selector or Diagnostic Data Reader/Tool (DDR) button and display names are printed in bold capital letters — **UP** (↑), **DOWN** (↓), **MODE**, **MONITOR**, **SELECT**, etc.

Transmission range shifts are indicated by the letter or number on the shift selector, in bold text, followed by the name of the range in parentheses — **D** (Drive), **N** (Neutral), etc.

References to diagnostic messages displayed are printed within double quotation marks (“OL,” “OK,” etc.).

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NOTE:

This publication is revised periodically to include improvements, new models, special tools, and procedures. A revision is indicated by the date on the title page. Check with your Allison Transmission service outlet for the currently applicable publication. Additional copies of this publication may be purchased from authorized Allison Transmission service outlets. Look in your telephone directory under the heading of Transmissions — Truck, Tractor, etc.

IMPORTANT SAFETY NOTICE

IT IS YOUR RESPONSIBILITY to be completely familiar with the Warnings and Cautions described in this Service Manual. These Warnings and Cautions advise against the use of specific service methods that can result in personal injury, damage to the equipment, or cause the equipment to become unsafe. It is, however, important to understand that these Warnings and Cautions are not exhaustive. Allison Transmission could not possibly know, evaluate, and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Allison Transmission has not undertaken any such broad evaluation. Accordingly, **ANYONE WHO USES A SERVICE PROCEDURE OR TOOL WHICH IS NOT RECOMMENDED BY ALLISON TRANSMISSION MUST** first be thoroughly satisfied that neither personal safety nor equipment safety will be jeopardized by the service methods selected.

Proper service and repair are important to the safe, reliable operation of the equipment. The service procedures recommended by Allison Transmission and described in this Service Manual are effective methods for performing service operations. Some of these service operations require the use of tools specifically designed for the purpose. The special tools should be used when and as recommended.

WARNINGS, CAUTIONS, AND NOTES

Three types of headings are used in this manual to attract your attention:

WARNING!

is used when an operating procedure, practice, etc., which, if not correctly followed, could result in personal injury or loss of life.

CAUTION:

is used when an operating procedure, practice, etc., which, if not strictly observed, could result in damage to or destruction of equipment.

NOTE:

is used when an operating procedure, practice, etc., is essential to highlight.

LIST OF WARNINGS

This manual contains the following Warnings —

IT IS YOUR RESPONSIBILITY TO BE FAMILIAR WITH ALL OF THEM.

If you leave the vehicle and the engine is running, the vehicle can move suddenly and you or others could be injured. If you must leave the engine running, do not leave the vehicle until you:

- Put the transmission in N (Neutral)...and
- Apply the parking brake and emergency brakes and make sure they are properly engaged...and
- Chock the wheels and take any other steps necessary to keep the vehicle from moving.

Avoid contact with the hot fluid or the sump when draining transmission fluid. Direct contact with the hot fluid or the hot sump may result in bodily injury.

DO NOT conduct a converter stall test until the following actions are taken. The parking brake and/or emergency brakes must be set and properly engaged and the wheels must be chocked. Warn personnel to keep clear of the vehicle and its travel path. Failure to do so can cause serious injury.

Use appropriate safety equipment such as safety glasses, safety shoes, and gloves.

Do not burn discarded Teflon[®] seals; toxic gases are produced by burning Teflon[®].

Never dry bearings by spinning them with compressed air. A spinning bearing can disintegrate, allowing balls or rollers to become lethal flying projectiles. Also, spinning a bearing without lubrication can damage the bearing.

DO NOT disconnect the hydraulic fluid line between the accumulator and the retarder until air and hydraulic pressure have been bled from the retarder.

PREVENT PERSONAL INJURY: Use proper tools and lifting equipment when installing or removing a transmission from the repair stand. Transmission dry weights are as follows:

- | | |
|-------------------------------|------------------|
| • 4000 MH/HD/B 500 (Basic) | 377 kg (831 lb) |
| • With PTO Provision | 405 kg (893 lb) |
| • With Retarder | 411 kg (906 lb) |
| • With PTO and Retarder | 439 kg (968 lb) |
| • HD 4070 w/ PTO and Retarder | 555 kg (1224 lb) |

Get help when lifting the control module. Assistance from a hoist or another person may be required. The control module weighs approximately 25 kg (55 lb).

LIST OF WARNINGS

This manual contains the following Warnings —

IT IS YOUR RESPONSIBILITY TO BE FAMILIAR WITH ALL OF THEM.

Get help when lifting the C6 adapter housing module. Assistance from a hoist or another person may be required. The C6 adapter housing module weighs approximately 68kg (150 lb).

Carefully release spring force. Piston springs are highly compressed. Personal injury can occur if the spring force is not controlled.

Place the P3 planetary assembly on its side to avoid possible injury while disassembling the planetary.

Piston springs are highly compressed. Be extremely careful during removal and installation. Personal injury can occur if the spring force is not controlled.

Be sure that lifting equipment and the repair stand can properly support the weight of the transmission being serviced. The dry weights are:

- **HD 4060/4560/B 500PR Series 440 kg (968 lb)**
- **HD 4060/4560/B 500P Series 406 kg (893 lb)**
- **HD 4070PR 640 kg (1411 lb)**
- **HD 4070P 606 kg (1336 lb)**

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