



**PARTS MANUAL**  
**FOR**  
**CT16N/H/HX SERIES**

**MARMON-HERRINGTON ALL-WHEEL DRIVE**

13001 Magisterial Drive • Louisville, KY 40223  
(502) 253-0277 • (800) 227-0727 • Fax (502) 253-0317  
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# TABLE OF CONTENTS

## FORWARD

WARRANTY POLICY AND PROCEDURE ..... 3-5

## CT16N/H/HX SERIES

DIFFERENTIAL CARRIER HOUSING CT16N/H/HX ..... 6-7

DIFFERENTIAL CT16N/H/HX ..... 8-9

AXLE HOUSING CT16N/H/HX ..... 10-11

PLANETARY CT16N/H/HX ..... 12-13

WHEEL HUB, BRAKE DRUM CT16N/H/HX ..... 14-15

BRAKE CT16N/H/HX ..... 16-17

TIE-ROD CT16N/H/HX ..... 18-19



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# FORWARD

## GENERAL

This manual has been prepared for operators and service personnel working with the Marmon-Herrington series of transfer cases and front drive axles. For further technical assistance, please contact Marmon-Herrington Customer Service.

Please observe and follow all procedural and maintenance guidelines to ensure reliable operation and optimum service life. The Marmon-Herrington basic service schedule will integrate seamlessly with most preventative maintenance programs.

Marmon-Herrington shall not be liable for component failures or damages caused by operational abuse or neglect. Please review the Warranty Statement for a detailed explanation of coverage and claim reporting procedures.

We thank you for your investment in Marmon-Herrington equipment, and look forward to serving your needs in the tradition of engineering excellence.

## MISCELLANEOUS ISSUES

### Tires and Gear Ratios

When vehicles are still in the specification stage prior to construction, a great deal of thought and calculation goes into determining what tires and gear ratios will be best suited to the engine and transmission combination being used. This is especially true of AWD (all-wheel-drive) type vehicles because front and rear drive axles are interconnected through the transfer case, and therefore vulnerable to the adverse effects of differential tire speed. The most prominent of these adverse conditions is called “wind-up” which is caused by “ratio mis-match.”

Effectively, this means that by virtue of different tire sizes or gear ratios from front to rear, one set of tires is trying to turn faster than the other. This generates excessive amounts of torque (wind-up) which is transmitted through the drive train. These extreme torsional loads can cause damage to differential gears, transfer cases, even engines and transmissions.

With the preceding in mind, the owner or operator should feel compelled to seek expert advice when considering alternative gear ratios or tires.

### Operations

#### 1) USE OF AWD MODE

Your Marmon-Herrington transfer case or axle may find itself paired with a front drive axle in an AWD application as previously described. If so, there are a few points of operational practice that will ensure a long, trouble free service life. In the tire and ratio discussion we demonstrated one source of drive train wind-up, and some of the undesirable effects. The same consequences may be experienced through yet a different mode of abuse.

As close as engineers try to match gear ratios and tires for a given application, the reality is that there will always be some degree of mis-match between front and rear axles. When a vehicle is operated on a hard, dry surface with the front axle engaged (AWD, 4x4, 6x6, etc.), the tires are not able to slip and relieving the torsional forces being generated.

As such, Marmon-Herrington equipped vehicles are designed for “as needed” AWD operation only, in “off-road” conditions. They are not intended to be driven in AWD mode on hard, dry surfaces.

#### 2) SHIFTING OF AXLE OR TRANSFER CASE

Marmon-Herrington Axles and Transfer Cases use no clutching devices, and therefore should only be shifted when the vehicle is at a full stop. This applies to front axle engagement, high and low ranges, and locking differentials. The only exceptions are those vehicles equipped with Marmon-Herrington’s **SAFE-T-SHIFT** system, which are calibrated to shift up to 4 mph.

### SAFE-T-SHIFT

Marmon-Herrington Transfer Cases do not employ any clutching device, and therefore are not of a class that may be shifted “on the fly”, or when the vehicle is in motion. This applies to shifting between HIGH and LOW ranges as well as engaging the front axle. Shifting on the fly results in two different types of internal and external damage. The first is degradation of the engagement teeth due to relative rotation of drive gears and shift collars. This type of damage can prevent the case from shifting normally, as the teeth become burred and cannot mesh.

The second condition imparts excessive shock loading throughout the entire drive train. This occurs when a shift is attempted at the precise moment of tooth alignment (gears meshing), and the shift is actually completed at excessive speed. This results in high torque loading that is transmitted through the transfer case, drive shafts, and axles. The extent of the damage possible increases proportionately with the vehicle speed.

Over the years we have tried to protect end users from this mode of failure with operational placards, audible warnings, and light signals. Despite these efforts, we have yet to fully discourage this destructive practice.

In December 2003 Marmon-Herrington developed an electronic management system called **SAFE-T-SHIFT** to help prevent shift on the fly events. It consists of a microprocessor that receives speed information from a remote sensor in the transfer case. The system is calibrated to activate the shift solenoids at the first detection of motion, and then cancel control functions at 4 mph.

The actual completion of a shift still relies on tooth alignment of the gear sets, and the vehicle may need to roll a few feet before the transfer case can shift. Because the system becomes active at first motion and maintains air pressure thereafter, it is possible to accelerate rapidly to a speed greater than 4 mph before tooth alignment occurs, completing the shift. In this case, the shift may occur at a speed great enough to cause shock damage. For this reason, it is essential that the operator let the vehicle “walk” or idle forward until the shift is complete before accelerating normally.

### Shift Procedure

1. With the vehicle at a complete stop, select the desired range or front axle position.
2. Place the main transmission in gear.
3. Allow the vehicle to idle forward (or backwards) at walking speed until shift is completed.
4. Accelerate normally.

In the case of a manual transmission, ease the clutch out in low gear, allowing the vehicle to “walk” until shift is completed.

Some possible exclusions to the Safe-T-Shift program are those vehicles fitted with a transfer case mounted PTO, Freightliner factory conversions, and any with Rockwell transfer cases.

## **MARMON-HERRINGTON WARRANTY**

This is to certify that we, Marmon-Herrington Company, Louisville, Kentucky, warrant each new chassis remanufactured, or assembly or part furnished for the remanufacture of a truck chassis against defects in material and workmanship under normal use and service. Marmon-Herrington's obligation under this warranty is limited to replacement of, at our factory, any part or parts thereof which shall, within one (1) year after delivery of such vehicle to the final user after installation of the all-wheel drive conversion kit, be returned to us with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective.

Marmon-Herrington will warrant covered components against defects in material and workmanship under normal use and service for the specified period. This warranty includes all internal components with the following exceptions: Exceptions include, but are not limited to wear items such as brake linings and drums, oil seals and bearings, which will be covered for a period of 12 months or 12,000 miles, whichever ever occurs first.

Failure to follow designated maintenance procedures and schedules, maintain required lubrication levels, or any form of operational abuse or misuse will void all warranty coverage expressed or implied.

Failure reporting and claims submission procedures are to be followed as outlined in the standard warranty guidelines

Service parts are manufactured to the same standards as production installed parts. However, since the installation thereof, as well as the age and condition of the receiving vehicle are beyond the control of Marmon-Herrington, Service Parts are warranted for a period of ninety (90) days or five thousand (5,000) miles whichever first occurs. All other regular warranty conditions apply.

On vehicles operating OVERSEAS, the determination of defects will be made at Marmon-Herrington Company, Louisville, Kentucky, from complete information supplied in writing by overseas distributors or recognized acting distributors. Complete information is defined to mean: vehicle serial number, user's name, date of delivery, mileage at time of breakage, date of breakage, type of service, nature of break or fault, distributor's recommendation (for our guidance only), and any other pertinent information. After determination of our obligation, any parts to be replaced will be shipped to distributor or acting distributor in accordance with his instructions.

This warranty is in lieu of all other warranties expressed or implied and of all other obligations or liabilities incurred by Marmon-Herrington. Marmon-Herrington neither assumes nor authorizes any other person to assume any other liability in connection with this sale, including but not limited to indirect or consequential damages.

This warranty shall not apply to any vehicle which shall have been repaired or altered in any way so as in our judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence, or accident, nor which shall have been operated at a speed exceeding the factory rated speed or loaded beyond the factory rated load capacity or operated in violation of Marmon-Herrington's instructions.

Marmon-Herrington makes no warranty whatever on components of the original manufacturer's chassis not related

to the modification work. Also, no warranty is made on tires, rims, ignitions, or other parts usually warranted separately by their respective manufacturers.

The manufacturers reserve the right to make changes in design, and changes or improvements upon their product, without notice, and without incurring any obligation to install such changes or improvements upon their products theretofore manufactured.

This warranty shall become effective only when the Warranty Certificate has been returned to Marmon-Herrington and validated by the same.

In the case of vehicles operating in extreme conditions such as corrosive material mines, deep- water zones or areas of hostile aggression, the following warranty limitations apply:

Marmon-Herrington shall not be responsible for damage caused by chemical corrosion, internal water damage due to total immersion, or explosive impact. These conditions constitute severe duty and are not covered by Marmon-Herrington standard warranty.

## **WARRANTY REPAIR AND CLAIM PROCEDURE**

### **Initial Failure Reporting**

1. Operator must call Marmon-Herrington Customer Service prior to performing any repairs and receive a Repair Authorization Number to be eligible for reimbursement. The work authorization number does not guarantee payment but is an acknowledgement that the vehicle is within the warranty period in terms of date and mileage, and that a claim has been activated. **It will be the responsibility of the operator to ensure that their repair facility is aware of, and complies with, the guidelines of this policy.**
2. To expedite the authorization process, you will need the Sales Order Number or "S" number found on the front of this certificate. You will also need the Vehicle Identification Number or the last six digits of the "VIN", the date the vehicle was placed in service, and the current mileage. Please note the following:
  - This Warranty Registration should have been submitted at the time of delivery. If our records do not include a warranty registration, you must complete one before any authorization for repair can be issued. We will make them available by mail or fax upon request.
3. Marmon-Herrington will pre-approve .5 hours diagnosis/inspection time prior to your call for repair authorization. If the the diagnosis/inspection complaint does not reveal a warrantable failure, or result in a warrantable repair, the customer will be responsible for all charges including diagnosis/inspection time.
4. The Operators Manual contains information covering proper equipment use and maintenance schedules. Operators must adhere to these guidelines to be eligible for reimbursement, and service records must be provided upon request.

### **Pre-Repair Requirements**

1. Authorization for repairs will require a written estimate/repair order of costs after determination that a warrantable condition is found to exist.

- Estimates must contain the following information:
  - A list of all parts necessary for specific job and if applicable, all parts that will be invoiced back to Marmon-Herrington.
  - The cost of disassembly, inspection and diagnosis of any portion of the vehicle to determine extent of repairs needed.
  - Current labor costs, reflecting both hourly rate and number of hours to effect repairs must be listed.
  - Miscellaneous charges such as "shop supplies" must be defined. Actual dollar amounts must be listed, as percentages will not be accepted.
  - Sublet repairs must also be defined and included in the estimate at their actual dollar amount.
  - NOTE: If it becomes necessary to exceed the original estimate in terms of parts or labor, the repair facility must call Marmon-Herrington Customer Service for additional authorization.
- Only the use of Marmon-Herrington supplied parts will constitute reimbursement unless prior approval has been obtained.

### Parts Ordering

While Marmon-Herrington operates a full service Parts Department, replacement parts needed to effect Warranty repairs must be acquired through Customer Service to be eligible for reimbursement.

### Post Repair Requirements

The final invoice or work order must include the following:

- Customer's name, address, and phone number.
- The Vehicle Identification number.
- The Sales Order Number or "S" number, which the customer can provide or can be located on the ID tag, fixed to the transfer case or axle.
- The Axle or Transfer Case Model and Serial Number, also located on the ID tag.
- Mileage In / Mileage Out.
- The Cause and Correction of the repair including detailed description of repairs and parts replaced.
- The date the repair order was open and the date the repairs were completed.
- The Work Authorization Number obtained from Customer Service.

### Notes to Repair Facilities

- Miscellaneous charges such as "shop supplies" must be listed as separate line items and shown on the final invoice as stated in "Pre-Repair Requirements." Invoices for sublet repairs must be made available upon request.
- All repairs must comply with any or all state and DOT requirements.
- Downtime of vehicle and incurred costs associated due to the delay of parts shipments or any other condition beyond our control is not reimbursable and should not be listed on the invoice.
- All failed parts that are required to be returned to Marmon-Herrington must be received before payment will be made. The Return Authorization will be sent with the replacement parts when shipped from Marmon-Herrington.
- All Claims must be submitted within 60 days of completion of repairs to be eligible for reimbursement.

For Work Authorization call: (800) 227-0727, Ext. 282  
 To Submit Claims by Fax: (502) 253-0317

Submit Claims by Mail to:  
 Marmon-Herrington Company, Customer Service Department,  
 13001 Magisterial Drive, Louisville, KY 40223.

### REPLACEMENT PARTS

When ordering replacement parts for **MARMON-HERRINGTON ALL-WHEEL DRIVE** installations, the following information should be given:

- FACTORY ORDER NUMBER** (found on I.D. Plate or small plate affixed to axle housing). This will be a six (6) digit number. (See illustrations this page.)
- Component for which parts are required, i.e. front drive axle or transfer case/drop box.
- Model of axle and/or transfer case/drop box, i.e. MT10, MVG 750, MDB500.
- Give quantity and part number required. **NOTE:** Drivelines, shift linkage, etc., can be found on the computer printout of Bill of Material, which is included in the Service Manual.
- Give complete billing and shipping address.

### CALL IN PROCEDURE

Before proceeding with repairs or ordering parts that you feel may be covered under warranty, you must first contact Marmon-Herrington Customer Service Department to obtain a Repair Authorization Number.

(800) 227-0727, Ext. 282      8am-5pm EST  
 (502) 693-1129                      5pm-8pm EST

Please be prepared to supply the following information:

**Factory Order Number or "S-Number"** This is located on an ID plate fixed to either the driver's door panel or the component (axle or transfer case) itself. This plate will also show the component's model and serial number. Example: S-7777-05

**Component Model and Serial Number**  
**Vehicle Year, Make and Model**  
**Vehicle Identification Number**  
**Mileage**  
**In Service Date**

Please refer to our website ([www.marmon-herrington.com](http://www.marmon-herrington.com)) for the latest versions of our parts and service manuals, as well as new products and contact information.

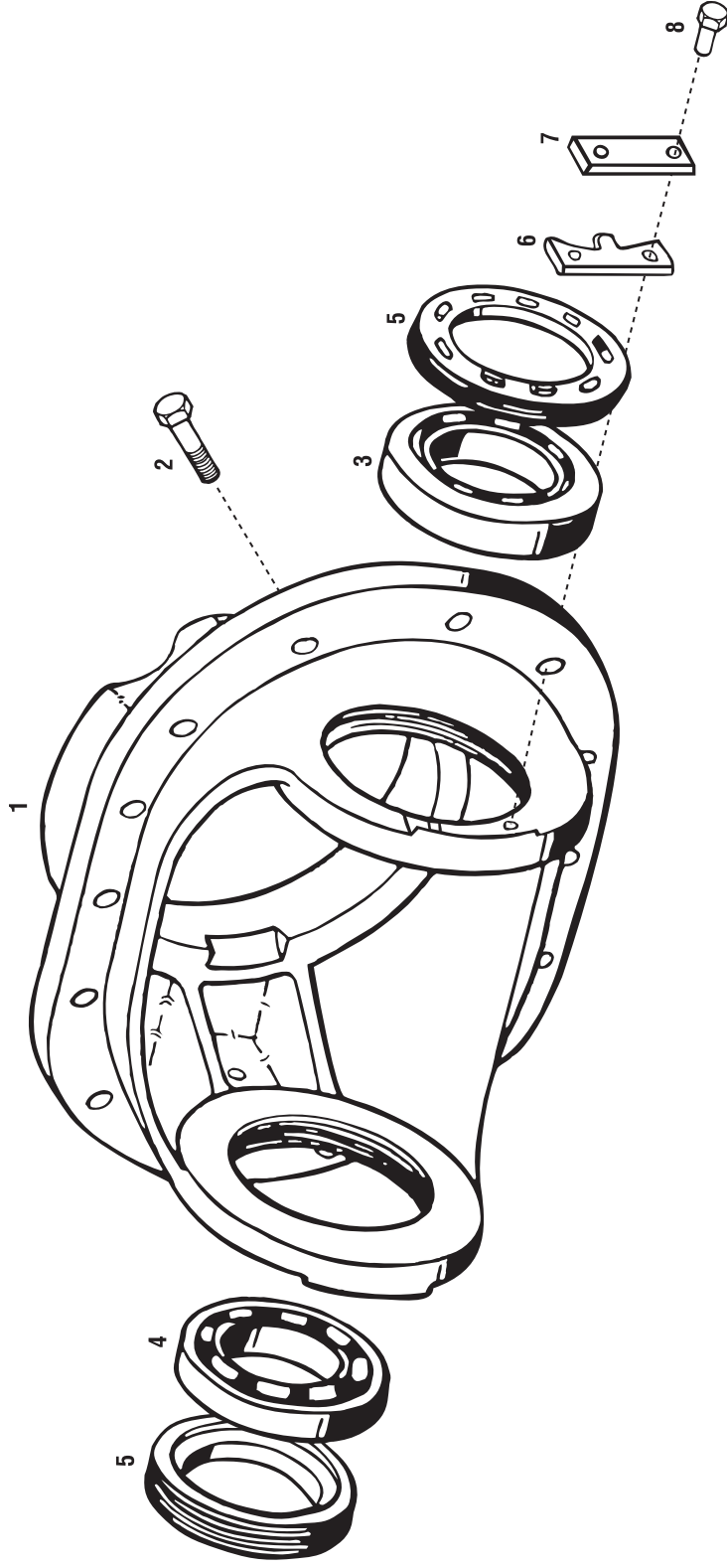
**The information necessary for replacement parts and/or warranty claim procedures will be found on either plate design.**

|                          |         |
|--------------------------|---------|
| <b>MARMON-HERRINGTON</b> |         |
| SALES ORDER              | 0000-00 |
| RATIO                    |         |
| S/N                      |         |
| TYPE                     |         |
| CUST P/N                 |         |

|  |         |
|--|---------|
| <b>MARMON-HERRINGTON</b>   |         |
| SALES ORDER  | 0000-00 |
| S/N  |         |
| TYPE   |         |
| CUST P/N   |         |
| COVERED BY ONE OR MORE OF THE FOLLOWING PATENTS: U.S. PATENTS 4,878,691; 4,934,733; 5,016,912; 5,275,430; 5,839,750; AND 6,398,251; AND CA PATENT 1,316,185. OTHER U.S. AND FOREIGN PATENTS PENDING. |         |

|                             |         |
|-----------------------------|---------|
| <b>MARMON-HERRINGTON</b>    |         |
| <b>ALL-WHEEL DRIVE</b>      |         |
| LOUISVILLE, KENTUCKY U.S.A. |         |
| FACTORY ORDER NO.           | 0000-00 |
| INSTALLED BY                |         |
| <b>FRONT DRIVING AXLE</b>   |         |
| MODEL                       |         |
| CAPACITY                    |         |
| SERIAL NO.                  |         |
| RATIO                       |         |
| <b>TRANSFER CASE</b>        |         |
| MODEL                       |         |
| SERIAL NO.                  |         |

# DIFFERENTIAL CARRIER HOUSING CT16N/H/HX



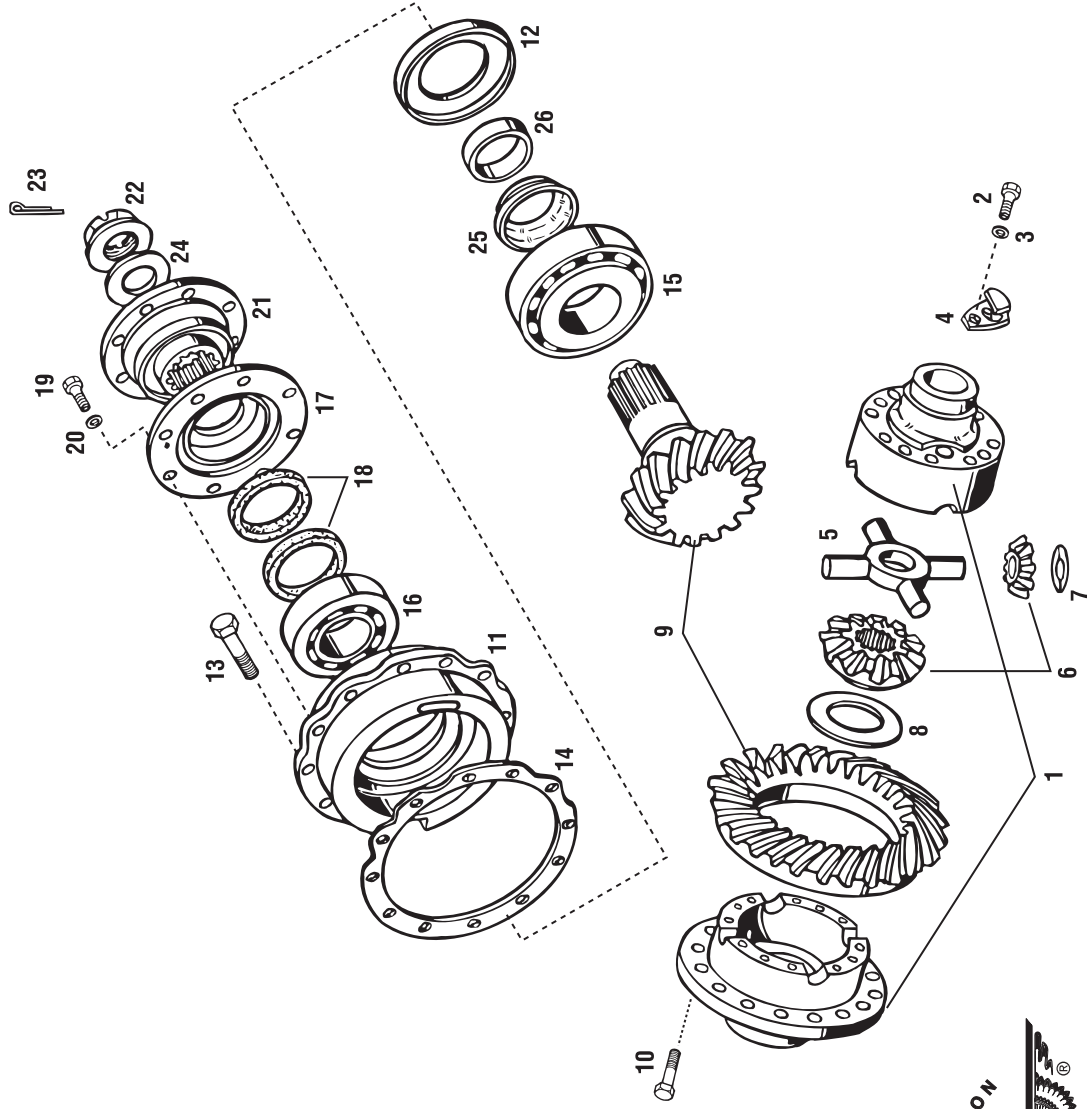
| ITEM NO. | MH PART NO. | DESCRIPTION                        | QTY. REQ. | ITEM NO. | MH PART NO. | DESCRIPTION | QTY. REQ. |
|----------|-------------|------------------------------------|-----------|----------|-------------|-------------|-----------|
| 1        | MT22-1076   | Differential Carrier Housing Assy. | 1         |          |             |             |           |
| 2        | MT22-1077   | Flanged Bolt, Special              | 14        |          |             |             |           |
| 3        | MT22-1078   | Differential Side Bearing Assy.    | 1         |          |             |             |           |
| 4        | MT22-1212   | Differential Side Bearing Assy.    | 1         |          |             |             |           |
| 5        | MT22-1079   | Bearing Adjuster                   | 2         |          |             |             |           |
| 6        | MT22-1080   | Lock Plate                         | 2         |          |             |             |           |
|          | MT22-1080A  | Lock Plate                         | 2         |          |             |             |           |
| 7        | MT22-1081   | Lock Plate                         | 2         |          |             |             |           |
| 8        | 11500773    | Hex Bolt, M8x16-1.25               | 4         |          |             |             |           |
|          |             |                                    |           |          |             |             |           |
|          |             |                                    |           |          |             |             |           |
|          |             |                                    |           |          |             |             |           |
|          |             |                                    |           |          |             |             |           |
|          |             |                                    |           |          |             |             |           |
|          |             |                                    |           |          |             |             |           |
|          |             |                                    |           |          |             |             |           |
|          |             |                                    |           |          |             |             |           |
|          |             |                                    |           |          |             |             |           |
|          |             |                                    |           |          |             |             |           |
|          |             |                                    |           |          |             |             |           |



**DIFFERENTIAL CARRIER HOUSING  
CT16N/H/HX**

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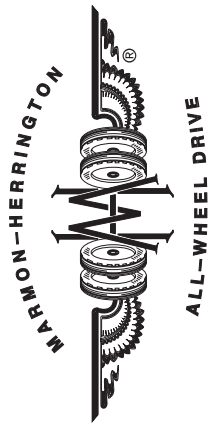
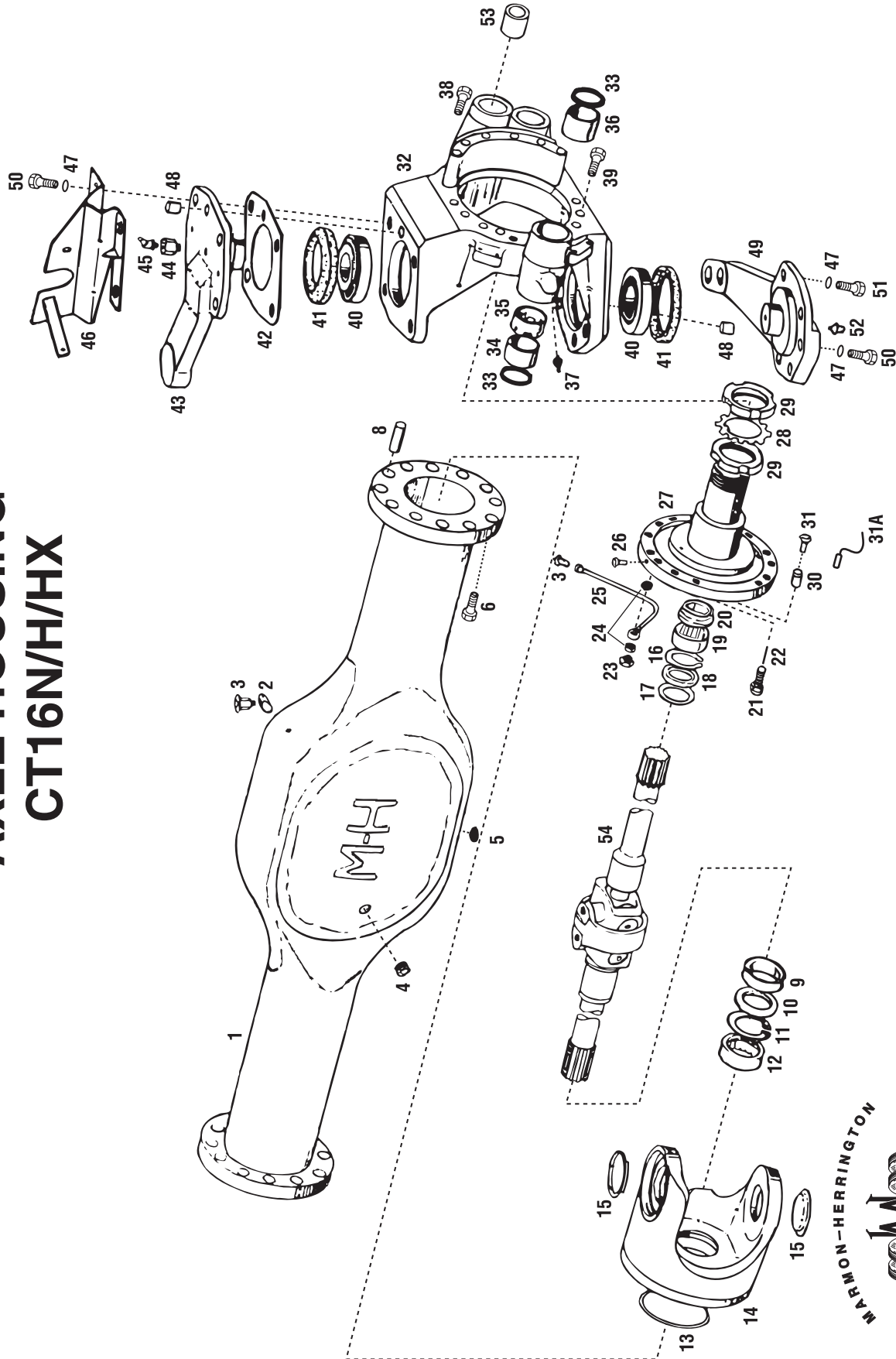


| COMPLETE CARRIER ASSEMBLY |                          |             |                                      |  |                   | DIFFERENTIAL CASE | QTY. REQ. |
|---------------------------|--------------------------|-------------|--------------------------------------|--|-------------------|-------------------|-----------|
| CARRIER P/N               | PINION & RING GEAR RATIO | FINAL RATIO | DESCRIPTION                          |  | DIFFERENTIAL CASE | QTY. REQ.         |           |
| MT23-1001                 | 1.227                    | 4.25        | Diff. Case Halves, Assy. (4.25-4.56) |  | MT22-1051         | 1                 |           |
| MT23-1002                 | 1.318                    | 4.56        | Diff. Case Halves, Assy. (4.92-6.68) |  | MT22-1051         | 1                 |           |
| MT23-1003                 | 1.422                    | 4.92        | Diff. Case Halves, Assy. (7.14-8.52) |  | MT22-1052         | 1                 |           |
| MT23-1004                 | 1.526                    | 5.29        | Hex Bolt, Special                    |  | MT22-1052         | 12                |           |
| MT23-1016                 | 1.553                    | 5.38        | Washer, Special                      |  | MT22-1052         | 2                 |           |
| MT23-1005                 | 1.632                    | 5.65        | Oil Baffle Plate                     |  | MT22-1052         | 2                 |           |
| MT23-1020                 | 1.684                    | 5.83        | Differential Cross                   |  | MT22-1052         | 1                 |           |
| MT23-1017                 | 1.765                    | 6.11        | Nest Kit                             |  | MT22-1052         | 1                 |           |
| MT23-1006                 | 1.812                    | 6.27        | Washer, Differential Pinion Gear     |  | MT22-1052         | 1                 |           |
| MT23-1007                 | 1.929                    | 6.68        | Washer, Differential Side Gear       |  | MT22-1052         | 1                 |           |
| MT23-1008                 | 2.077                    | 7.14        | Ring Gear and Pinion (1.227) 4.25    |  | MT22-1052         | 1                 |           |
| MT23-1009                 | 2.231                    | 7.72        | Ring Gear and Pinion (1.318) 4.56    |  | MT22-1052         | 1                 |           |
| MT23-1018                 | 2.415                    | 8.36        | Ring Gear and Pinion (1.422) 4.92    |  | MT22-1052         | 1                 |           |
| MT23-1019                 | 2.462                    | 8.52        | Ring Gear and Pinion (1.526) 5.29    |  | MT22-1052         | 1                 |           |
|                           |                          |             | Ring Gear and Pinion (1.553) 5.38    |  | MT22-1052         | 1                 |           |
|                           |                          |             | Ring Gear and Pinion (1.632) 5.65    |  | MT22-1052         | 1                 |           |
|                           |                          |             | Ring Gear and Pinion (1.684) 5.83    |  | MT22-1052         | 1                 |           |
|                           |                          |             | Ring Gear and Pinion (1.765) 6.11    |  | MT22-1052         | 1                 |           |
|                           |                          |             | Ring Gear and Pinion (1.812) 6.27    |  | MT22-1052         | 1                 |           |
|                           |                          |             | Ring Gear and Pinion (1.929) 6.68    |  | MT22-1052         | 1                 |           |
|                           |                          |             | Ring Gear and Pinion (2.077) 7.14    |  | MT22-1052         | 1                 |           |
|                           |                          |             | Ring Gear and Pinion (2.231) 7.72    |  | MT22-1052         | 1                 |           |
|                           |                          |             | Ring Gear and Pinion (2.415) 8.36    |  | MT22-1052         | 1                 |           |
|                           |                          |             | Ring Gear and Pinion (2.462) 8.52    |  | MT22-1052         | 1                 |           |

| ITEM NO. | MH PART NO. | DESCRIPTION  | QTY. REQ. |
|----------|-------------|--|-----------|
| 10       | MT22-1250   | Hex Bolt, Special                                  | 16        |
| 11       | MT22-1068   | Bearing Cage Assy.                                 | 1         |
| 12       | MT14-1078   | Oil Baffle Plate                                   | 1         |
| 13       | MT22-1077   | Flanged Bolt, Special                              | 12        |
| 14       | MT22-1067A  | Shim, 1.0 MM                                       | AR        |
|          | MT22-1067B  | Shim, .50 MM                                       | AR        |
|          | MT22-1067C  | Shim, .30 MM                                       | AR        |
|          | MT22-1067D  | Shim, .25 MM                                       | AR        |
|          | MT22-1067E  | Shim, .20 MM                                       | AR        |
| 15       | MT14-1075   | Pinion Bearing, Inner                              | 1         |
| 16       | MT14-1079   | Pinion Bearing, Outer                              | 1         |
| 17       | MT22-1070   | Cover  | 1         |
| 18       | MT22-1069   | Oil Seal Kit, Pinion                               | 1         |
| 19       | 11500713    | Hex Bolt, M8x22                                    | 8         |
| 20       | 11500191    | Flat Lock Washer, M8                               | 8         |
| 21       | MT17-1050   | Companion Flange, 1610 Series                      | 1         |
|          | MT22-1073   | Companion Flange, 1710 Series                      | 1         |
| 22       | MT14-1082   | Pinion Castle Nut                                  | 1         |
| 23       | 103422      | Cotter Pin   | 1         |
| 24       | MT22-1074   | Washer, Special                                    | 1         |
| 25       | MT14-1076   | Distance Sleeve                                    | 1         |
| 26*      | MT14-1077A  | Bearing Distance Ring, 6.90 MM                     | AR        |
|          | MT14-1077B  | Bearing Distance Ring, 7.00 MM                     | AR        |
|          | MT14-1077C  | Bearing Distance Ring, 7.02 MM                     | AR        |
|          | MT14-1077D  | Bearing Distance Ring, 7.04 MM                     | AR        |
|          | MT14-1077E  | Bearing Distance Ring, 7.06 MM                     | AR        |
|          | MT14-1077F  | Bearing Distance Ring, 7.08 MM                     | AR        |
|          | MT14-1077G  | Bearing Distance Ring, 7.10 MM                     | AR        |
|          | MT14-1077H  | Bearing Distance Ring, 7.20 MM                     | AR        |
|          | MT14-1077I  | Bearing Distance Ring, 7.32 MM                     | AR        |
|          | MT14-1077J  | Bearing Distance Ring, 7.44 MM                     | AR        |
|          | MT14-1077K  | Bearing Distance Ring, 7.56 MM                     | AR        |
|          | MT14-1077L  | Bearing Distance Ring, 7.68 MM                     | AR        |
|          | MT14-1077M  | Bearing Distance Ring, 7.80 MM                     | AR        |
|          | MT14-1077N  | Bearing Distance Ring, 7.92 MM                     | AR        |
|          |             | AR = As Required                                   |           |
|          |             | *Note: Choose 2 to produce proper bearing preload. |           |



# AXLE HOUSING CT16N/H/HX

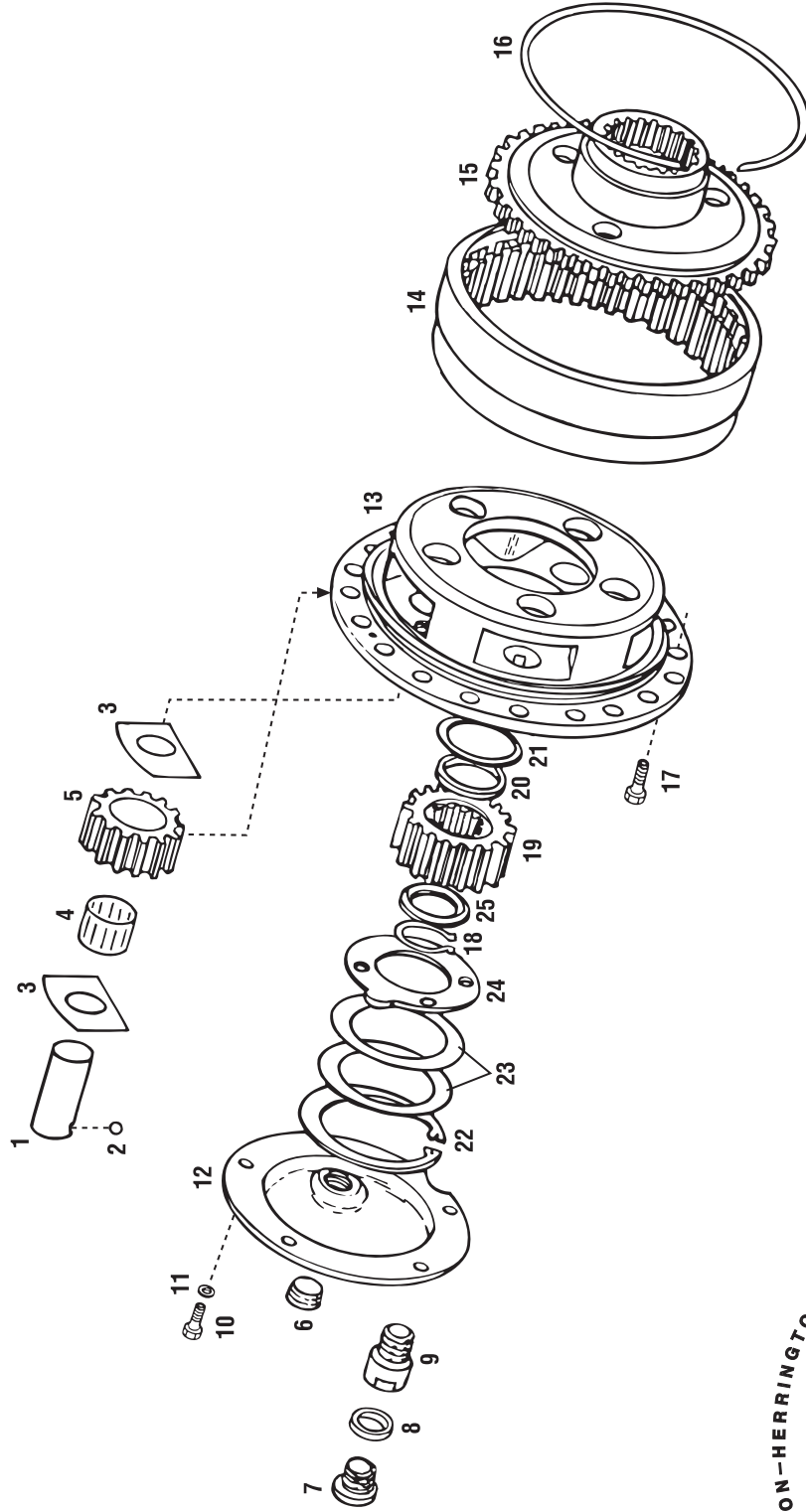


| ITEM NO. | MH PART NO. | DESCRIPTION                          | QTY. REQ. | ITEM NO. | MH PART NO. | DESCRIPTION                              | QTY. REQ. |
|----------|-------------|--------------------------------------|-----------|----------|-------------|--|-----------|
| 1        | CT16-1049   | Axle Housing                         | 1         | 31A      | MT93-1282   | ABS Sensor (Wabco)                       | 2         |
| 2        | MT22-1214   | Threaded Extension                   | 1         |          | MT93-2035   | ABS Sensor (Bendix)                      | 2         |
| 3        | MT14-1068   | Vent                                 | 3         |          | MT93-1283   | ABS Sensor Spring Clip                   | 2         |
| 4        | MT14-1070   | Fill Plug, Carrier                   | 1         | 32       | MT17-1110   | Knuckle Hsg. Assy, L.H.                  | 1         |
| 5        | MT14-1071   | Drain Plug, Carrier                  | 1         |          | MT17-1111   | Knuckle Hsg. Assy, R.H. (Not Shown)      | 1         |
| 6        | MT14-1072   | Hex Bolt, M20x1.5x60                 | 20        | 33       | MT14-1109   | Sealing Ring                             | 4         |
| 8        | MT14-1222   | Dowel Pin                            | 4         | 34       | MT14-1110   | Brake Spanner Bushing                    | 2         |
| 9        | MT10-1079   | Oil Seal Support Assy.               | 2         | 35       | MT14-1111   | Distance Ring                            | 2         |
|          | MT10-1080   | Felt Wiper                           | 2         | 36       | MT14-1112   | Brake Spanner Bushing                    | 2         |
| 10       | MT22-1116   | Oil Seal, Axle Shaft, Inner          | 2         | 37       | 191758      | Grease Fitting                           | 4         |
| 11       | MT22-1115   | Snap Ring                            | 2         | 38       | MT17-1105   | Hex Bolt, M14x1.5x102                    | 12        |
| 12       | MT22-1114   | Bearing, Axle Shaft, Inner           | 2         | 39       | MT17-1106   | Hex Bolt, M14x1.5x55                     | 16        |
| 13       | MT14-1088   | Sealing Ring, Housing to Yoke, 119x5 | 2         | 40       | MT14-1114   | Trunnion Bearing Assy, 050/110x29.25     | 4         |
| 14       | MT17-1024   | Yoke Housing, L.H.                   | 1         | 41       | MT14-1115   | Gasket                                   | 4         |
| 15       | MT17-1025   | Yoke Housing, R.H. (Not Shown)       | 1         | 42       | MT14-1117A  | Shim, Trunnion, 2.05 MM                  | AR        |
|          | MT14-1089   | Lock Cap                             | 4         |          | MT14-1117B  | Shim, Trunnion, 2.00 MM                  | AR        |
| 16       | MT14-1090   | Snap Ring                            | 2         |          | MT14-1117C  | Shim, Trunnion, 0.50 MM                  | AR        |
| 17       | MT10-1080   | Felt Wiper                           | 2         |          | MT14-1117D  | Shim, Trunnion, 0.30 MM                  | AR        |
| 18       | MT14-1092   | Oil Seal, Axle Shaft, Outer          | 2         |          | MT14-1117E  | Shim, Trunnion, 0.20 MM                  | AR        |
| 19       | MT14-1093   | Needle Roller Bearing, 50x65x22      | 2         | 43       | MT17-1009   | Steering Arm, L.H.                       | 1         |
| 20       | MT14-1094   | Distance Sleeve                      | 2         |          | MT17-1008   | Cover for Right Steering Support Housing | 1         |
| 21       | MT14-1095   | Turn Stop Bolt                       | 2         | 44       | MT14-1118   | Extension, Fitting                       | 2         |
| 22       | MT14-1096   | Jam Nut                              | 2         | 45       | 271285      | Grease Fitting                           | 2         |
| 23       | MT14-1098   | Hollow Screw                         | 2         | 46       | MT14-1120   | Brake Chamber Brk., L.H.                 | 1         |
| 24       | MT14-1099   | Bushing                              | 4         |          | MT14-1121   | Brake Chamber Brk., R.H. (Not Shown)     | 1         |
| 25       | MT14-1100   | Vent Tube                            | 2         | 47       | 85T-23      | Lockwire                                 | AR        |
| 26       | MT14-1101   | Screw                                | 2         | 48       | MT-14-1124  | Dowel Pin, 20m6x20-10.9                  | 4         |
| 27       | MT17-1018   | Spindle, L.H.                        | 1         | 49       | MT17-1022   | Tie-Rod Arm, L.H.                        | 1         |
|          | MT17-1019   | Spindle, R.H. (Not Shown)            | 1         |          | MT17-1023   | Tie-Rod Arm, R.H.                        | 1         |
| 28       | MT17-1133   | Locking Plate                        | 2         | 50       | MT14-1125   | Hex Bolt, M22x1.5x50                     | 16        |
| 29       | MT17-1132   | Spindle Nut, M70x2                   | 4         | 51       | MT14-1126   | Hex Bolt, M22x1.5x32                     | 4         |
| 30       | MT17-1112   | Bushing                              | 2         | 52       | 191758      | Grease Fitting                           | 2         |
| 31       | MT17-1113   | Anti-dust Plug                       | 2         | 53       | MT22-1241   | Bushing                                  | 4         |
|          |             |                                      |           | 54       | CT16-1151   | Axle Shaft Assy, L.H., Long              | 1         |
|          |             |                                      |           |          | CT16-1152   | Axle Shaft Assy, R.H., Short             | 1         |
|          |             |                                      |           |          |             | AR = As Required                         |           |

## AXLE HOUSING CT16N/H/HX



# PLANETARY CT16N/H/HX

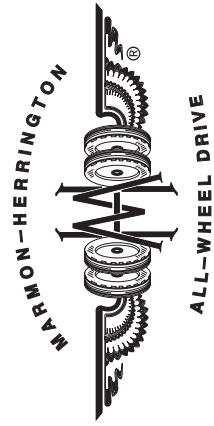
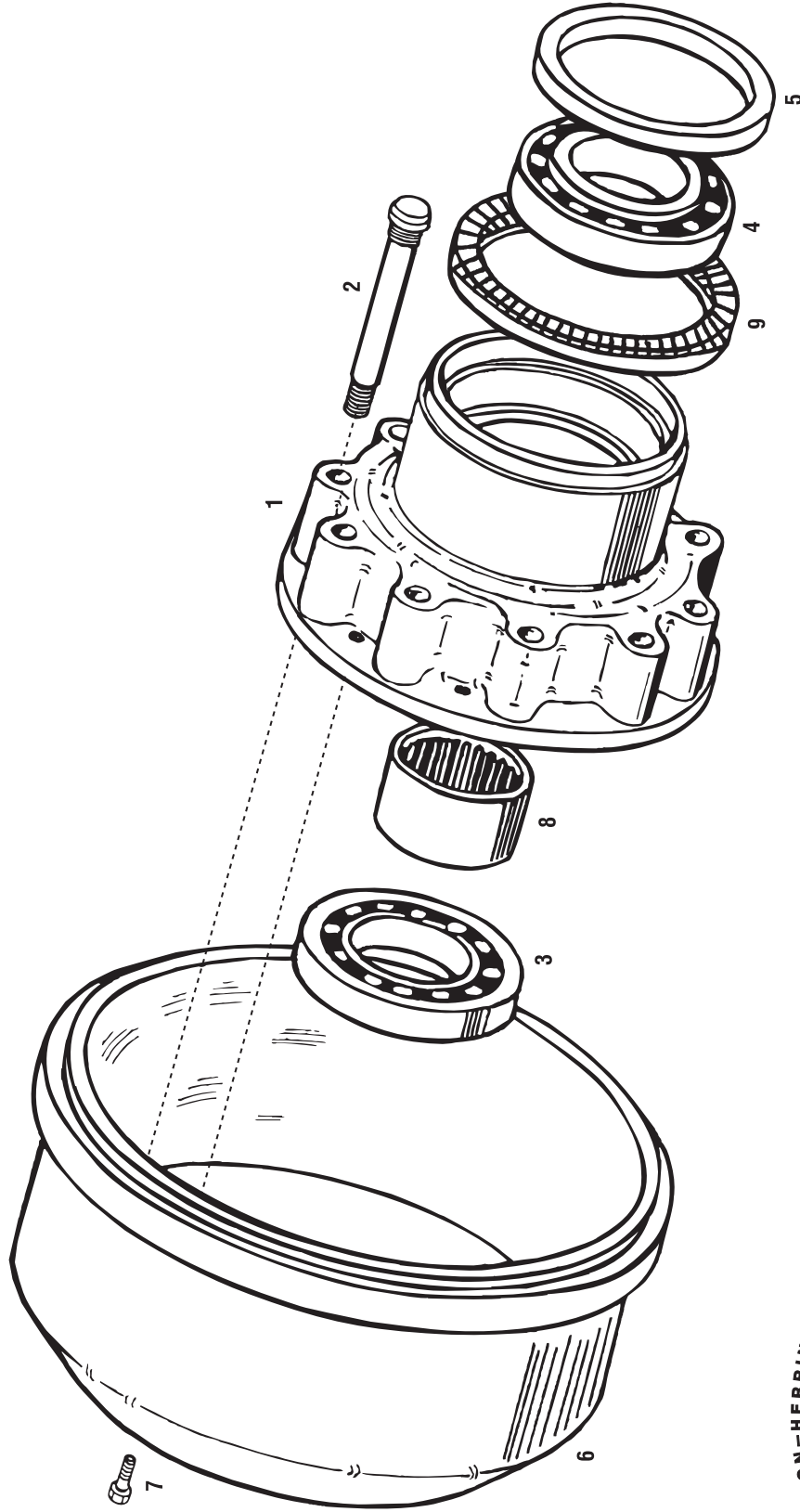


| ITEM NO. | MH PART NO. | DESCRIPTION                                   | QTY. REQ. | ITEM NO. | MH PART NO. | DESCRIPTION | QTY. REQ. |
|----------|-------------|---|-----------|----------|-------------|-------------|-----------|
| 1        | MT14-1217   | Planet Gear Pin                               | 10        |          |             |             |           |
| 2        | MT14-1218   | Steel Ball                                    | 10        |          |             |             |           |
| 3        | MT14-1219   | Distance Plate                                | 20        |          |             |             |           |
| 4        | MT14-1220   | Roller Bearing Assembly                       | 20        |          |             |             |           |
| 5        | MT14-1028   | Planet Gear                                   | 10        |          |             |             |           |
| 6        | MT14-1070   | Fill Plug, Planetary Hub                      | 2         |          |             |             |           |
| 7        | MT17-1213   | Drain Plug, Planetary Hub                     | 2         |          |             |             |           |
| 8        | MT14-1212   | Sealing Ring                                  | 2         |          |             |             |           |
| 9        | MT14-1211   | Threaded Stud                                 | 2         |          |             |             |           |
| 10       | 11500773    | Hex Bolt, M8x16-10.9                          | 10        |          |             |             |           |
| 11       | 11500191    | Lockwasher, M8                                | 10        |          |             |             |           |
| 12       | MT14-1029   | End Cover                                     | 2         |          |             |             |           |
| 13       | MT17-1128   | Planetary Gear Carrier (MT17N/H / CT16N/H/HX) | 2         |          |             |             |           |
| 14       | MT14-1025   | Planetary Ring Gear                           | 2         |          |             |             |           |
| 15       | MT14-1026   | Ring Gear Support Hub                         | 2         |          |             |             |           |
| 16       | MT14-1207   | Retaining Ring                                | 2         |          |             |             |           |
| 17       | 11500722    | Hex Bolt, M10x25-1.5                          | 8         |          |             |             |           |
| 18       | MT22-1154   | Snap Ring                                     | 2         |          |             |             |           |
| 19       | MT14-1024   | Sun Gear                                      | 2         |          |             |             |           |
| 20       | MT17-1156   | Distance Ring                                 | 2         |          |             |             |           |
| 21       | MT17-1157   | Friction Disc                                 | 2         |          |             |             |           |
| 22       | MT22-1157   | Snap Ring                                     | 2         |          |             |             |           |
| 23       | MT22-1158A  | Shim, .25 MM                                  | AR        |          |             |             |           |
|          | MT22-1158B  | Shim, .50 MM                                  |           |          |             |             |           |
|          | MT22-1158C  | Shim, 2.00 MM                                 |           |          |             |             |           |
| 24       | MT22-1159   | Friction Disc                                 | 2         |          |             |             |           |
| 25       | MT22-1153   | Spacer  | 2         |          |             |             |           |
|          |             | AR = As Required                              |           |          |             |             |           |

**PLANETARY  
 CT16N/H/HX**



# WHEEL HUB, BRAKE DRUM CT16N/H/HX

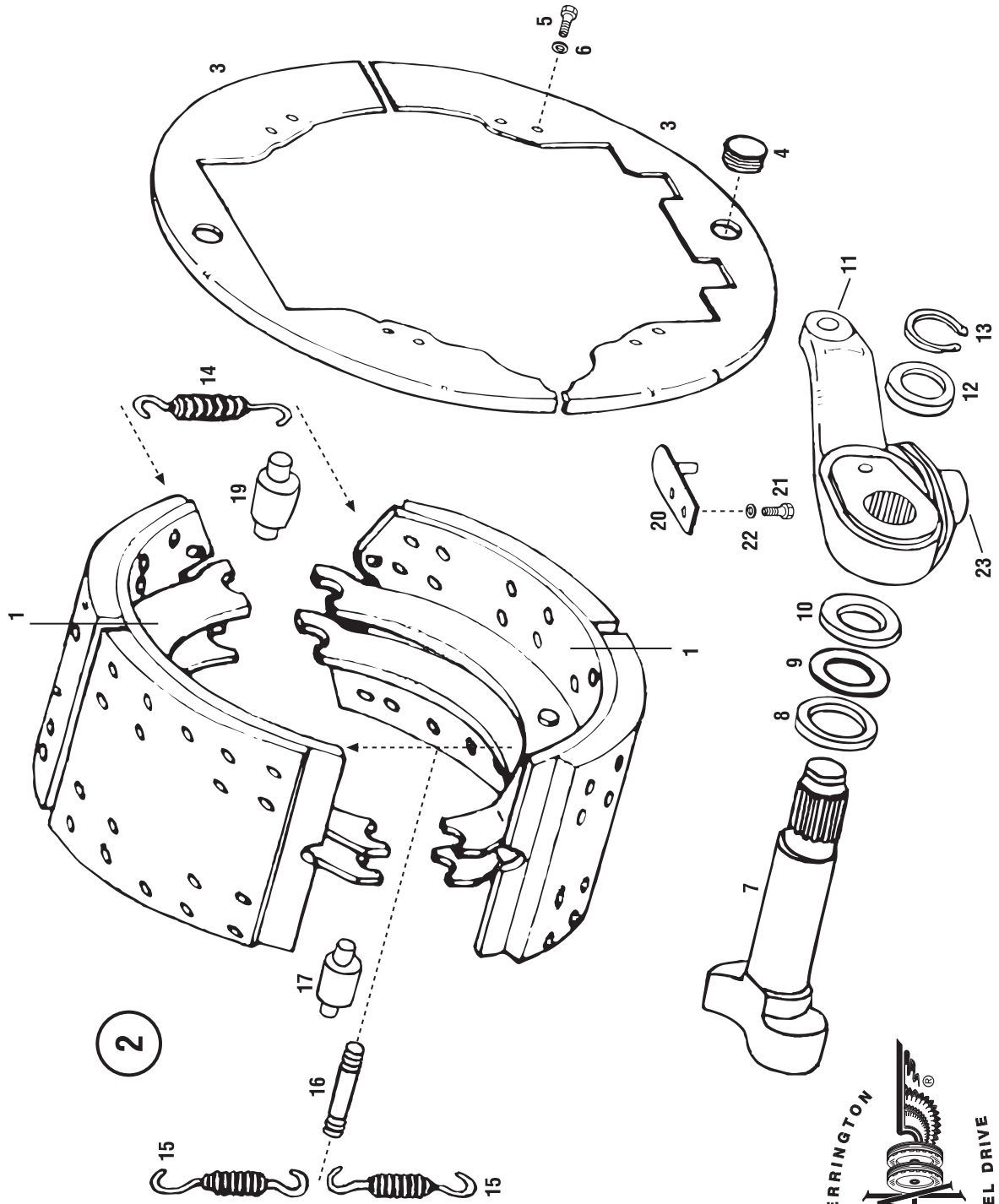


| ITEM NO. | MH PART NO. | DESCRIPTION  | QTY. REQ. | ITEM NO. | MH PART NO. | DESCRIPTION | QTY. REQ. |
|----------|-------------|--|-----------|----------|-------------|-------------|-----------|
| 1        | MT17-1229   | Wheel Hub Assembly, Left (MT17N / CT16N)             | 1         |          |             |             |           |
|          | MT17-1230   | Wheel Hub Assembly, Right (MT17N / CT16N)            | 1         |          |             |             |           |
|          | MT17-1231   | Wheel Hub Assembly (MT17H / CT16H)                   | 1         |          |             |             |           |
| 2        | MT17-1026   | Wheel Bolt, Left                                     | 10        |          |             |             |           |
|          | MT17-1027   | Wheel Bolt, Right                                    | 10        |          |             |             |           |
|          | T15372      | Nut, L.H.  | 10        |          |             |             |           |
|          | T15371      | Nut, R.H.  | 10        |          |             |             |           |
|          | MT93-1251   | Wheel Stud (ISO) Hub Mount<br>(MT17H / CT16H)        | 20        |          |             |             |           |
|          | MT93-1197   | Flange Nut (ISO)                                     | 20        |          |             |             |           |
|          | MT93-1631   | Wheel Stud (ISO) Aluminum Wheel<br>(MT17HX / CT16HX) | 20        |          |             |             |           |
|          | MT93-1838   | Flange Nut (ISO) Aluminum Wheel<br>(MT17HX / CT16HX) | 20        |          |             |             |           |
| 3        | MT14-1206   | Taper Roller Bearing                                 | 2         |          |             |             |           |
| 4        | MT14-1202   | Taper Roller Bearing                                 | 2         |          |             |             |           |
| 5        | MT14-1201   | Oil Seal   | 2         |          |             |             |           |
| 6        | MT17-1016W  | Brake Drum   | 2         |          |             |             |           |
| 7        | 11500725    | Hex Bolt, M10x35-10.9                                | 8         |          |             |             |           |
| 8        | MT14-1204   | Distance Sleeve                                      | 2         |          |             |             |           |
| 9        | MT75-9625   | Exciter Ring (ABS)                                   | 2         |          |             |             |           |
|          |             | AR = As Required                                     |           |          |             |             |           |
|          |             |  |           |          |             |             |           |
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## WHEEL HUB, BRAKE DRUM CT16N/HX



# BRAKE CT16N/HX

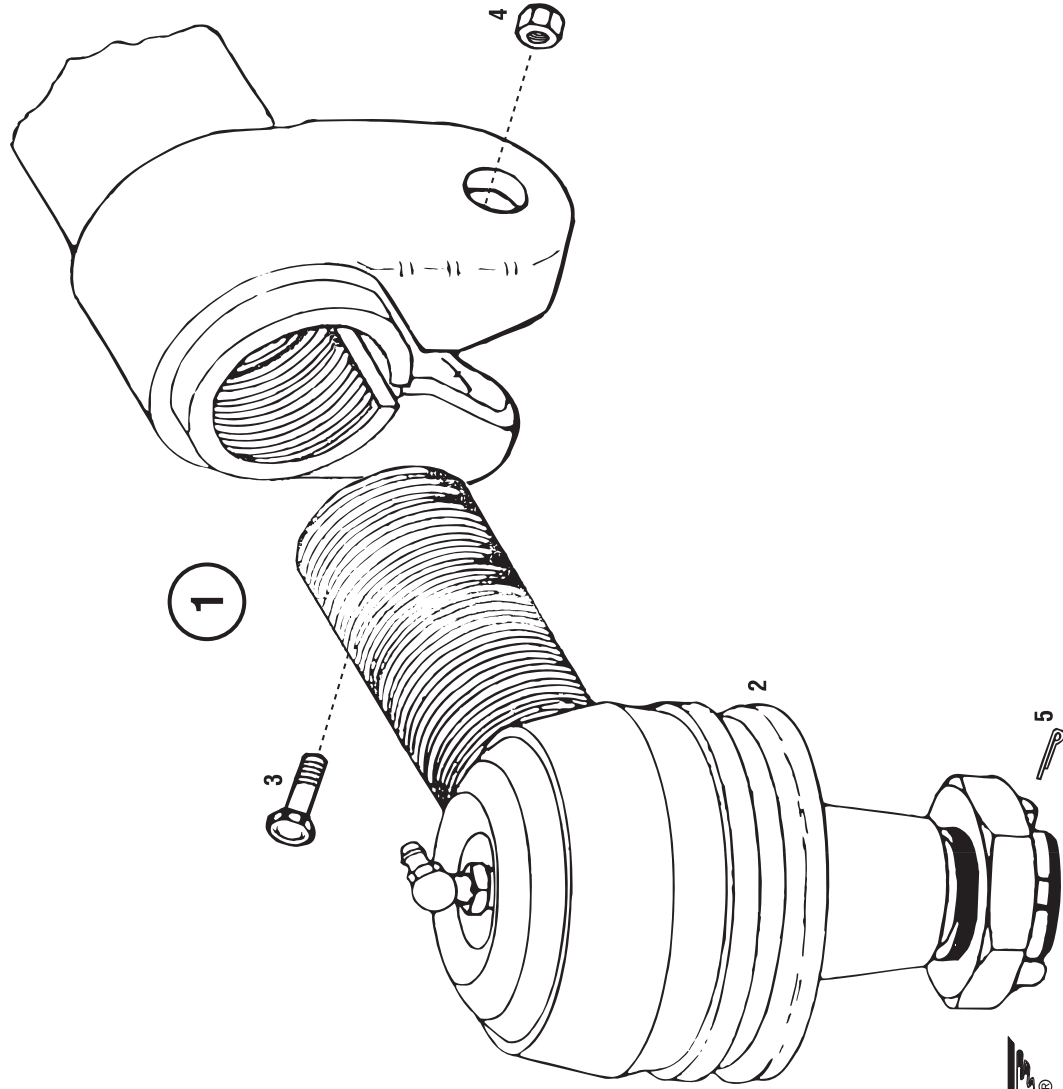




| ITEM NO. | MH PART NO. | DESCRIPTION   | QTY. REQ. | ITEM NO. | MH PART NO. | DESCRIPTION | QTY. REQ. |
|----------|-------------|---|-----------|----------|-------------|-------------|-----------|
| 1        | MT17-1255   | Brake Shoe Kit (Includes Item #2)                                 | 2         |          |             |             |           |
| 2        | MT17-1251   | Brake Spring and Roller Kit<br>(Includes Item #'s 14, 15, 17, 19) | 2         |          |             |             |           |
| 3        | MT17-1148   | Dust Shield, L.H. Set   | 1         |          |             |             |           |
|          | MT17-1149   | Dust Shield, R.H. Set   | 1         |          |             |             |           |
| 4        | MT14-1150   | Rubber Plug   | 4         |          |             |             |           |
| 5        | 11500777    | Hex Bolt, M10x15-5.6  | 16        |          |             |             |           |
| 6        | 11500192    | Flat Lock Washer  | 16        |          |             |             |           |
| 7        | MT17-1146   | Brake Spanner, Left   | 1         |          |             |             |           |
|          | MT17-1147   | Brake Spanner, Right (Not Shown)                                  | 1         |          |             |             |           |
| 8        | MT14-1145   | Spacer  | 2         |          |             |             |           |
| 9        | MT14-1143   | Washer  | 2         |          |             |             |           |
| 10       | MT22-1199   | Shim, 0.5 mm  | AR        |          |             |             |           |
| 11       | MT22-1237   | Slack Adj., Left  | 1         |          |             |             |           |
|          | MT22-1238   | Slack Adj., Right (Not Shown)                                     | 1         |          |             |             |           |
| 12       | MT17-1142   | Washer  | 4         |          |             |             |           |
| 13       | MT17-1141   | Snap Ring   | 2         |          |             |             |           |
| 14       | MT22-1177   | Brake Shoe Spring, Long   | 4         |          |             |             |           |
| 15       | MT14-1157   | Brake Shoe Return Spring, Short                                   | 2         |          |             |             |           |
| 16       | MT14-1158   | Spring Support Pin  | 4         |          |             |             |           |
| 17       | MT22-1178   | Brake Shoe Roller   | 4         |          |             |             |           |
| 19       | MT22-1243   | Brake Shoe Pin  | 4         |          |             |             |           |
| 20       | MT17-1143   | Stop, Left  | 1         |          |             |             |           |
|          | MT17-1144   | Stop, Right   | 1         |          |             |             |           |
| 21       | 11500773    | Hex Bolt, M8x16-1.25  | 4         |          |             |             |           |
| 22       | 11500191    | Flat Lock Washer  | 4         |          |             |             |           |
| 23       | MT22-1246   | Adjusting Cap, L.H.   | 1         |          |             |             |           |
|          | MT22-1247   | Adjusting Cap, R.H.   | 1         |          |             |             |           |
|          |             | AR = As Required  |           |          |             |             |           |



# TIE-ROD CT16N/H/HX



| ITEM NO. | MH PART NO. | DESCRIPTION                | QTY. REQ. | ITEM NO. | MH PART NO. | DESCRIPTION | QTY. REQ. |
|----------|-------------|----------------------------|-----------|----------|-------------|-------------|-----------|
| 1        | MT10-1127A  | Tie-Rod Assembly           | 1         |          |             |             |           |
| 2        | MT10-1128   | Ball Joint Head, Left      | 1         |          |             |             |           |
|          | MT10-1129   | Ball Joint Head, Right     | 1         |          |             |             |           |
| 3        | 11500735    | Hex Bolt, M12x1.75x65-10.9 | 2         |          |             |             |           |
| 4        | 11500756    | Self-locking Nut, M12x1.75 | 2         |          |             |             |           |
| 5        | 103411      | Cotter Pin, 3/16x2         | 2         |          |             |             |           |
|          |             |                            |           |          |             |             |           |
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|          |             |                            |           |          |             |             |           |



**TIE-ROD  
CT16N/H/HX**

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