



PARTS MANUAL

FOR

CT12H SERIES

MARMON-HERRINGTON ALL-WHEEL DRIVE

13001 Magisterial Drive • Louisville, KY 40223

(502) 253-0277 • (800) 227-0727 • Fax (502) 253-0317

E-mail: info@marmon-herrington.com

Visit our web site to view Repair & Parts Manuals

www.marmon-herrington.com

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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) for the latest versions of our parts and service manuals, as well as new products and contact information.

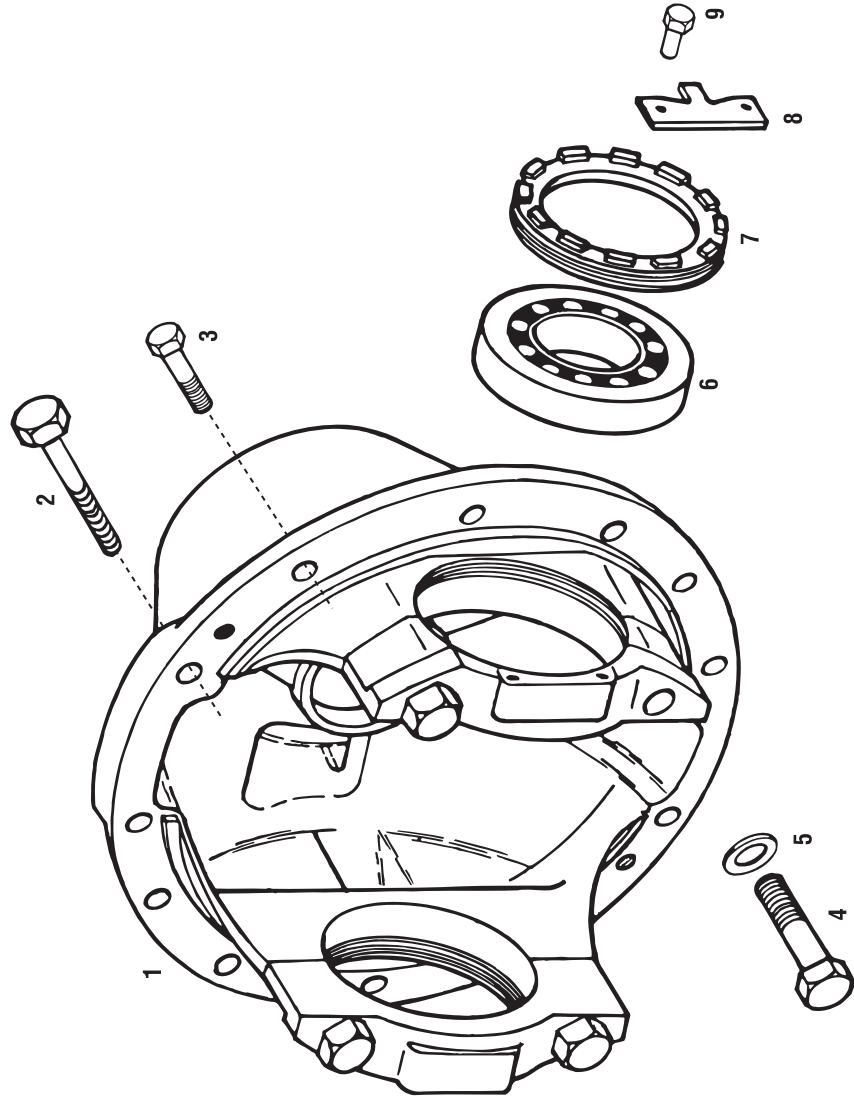
The information necessary for replacement parts and/or warranty claim procedures will be found on either plate design.

MARMON-HERRINGTON	
SALES ORDER	0000-00
RATIO	
S/N	
TYPE	
CUST P/N	

MARMON-HERRINGTON	
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.	

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

DIFFERENTIAL CARRIER HOUSING CT12H



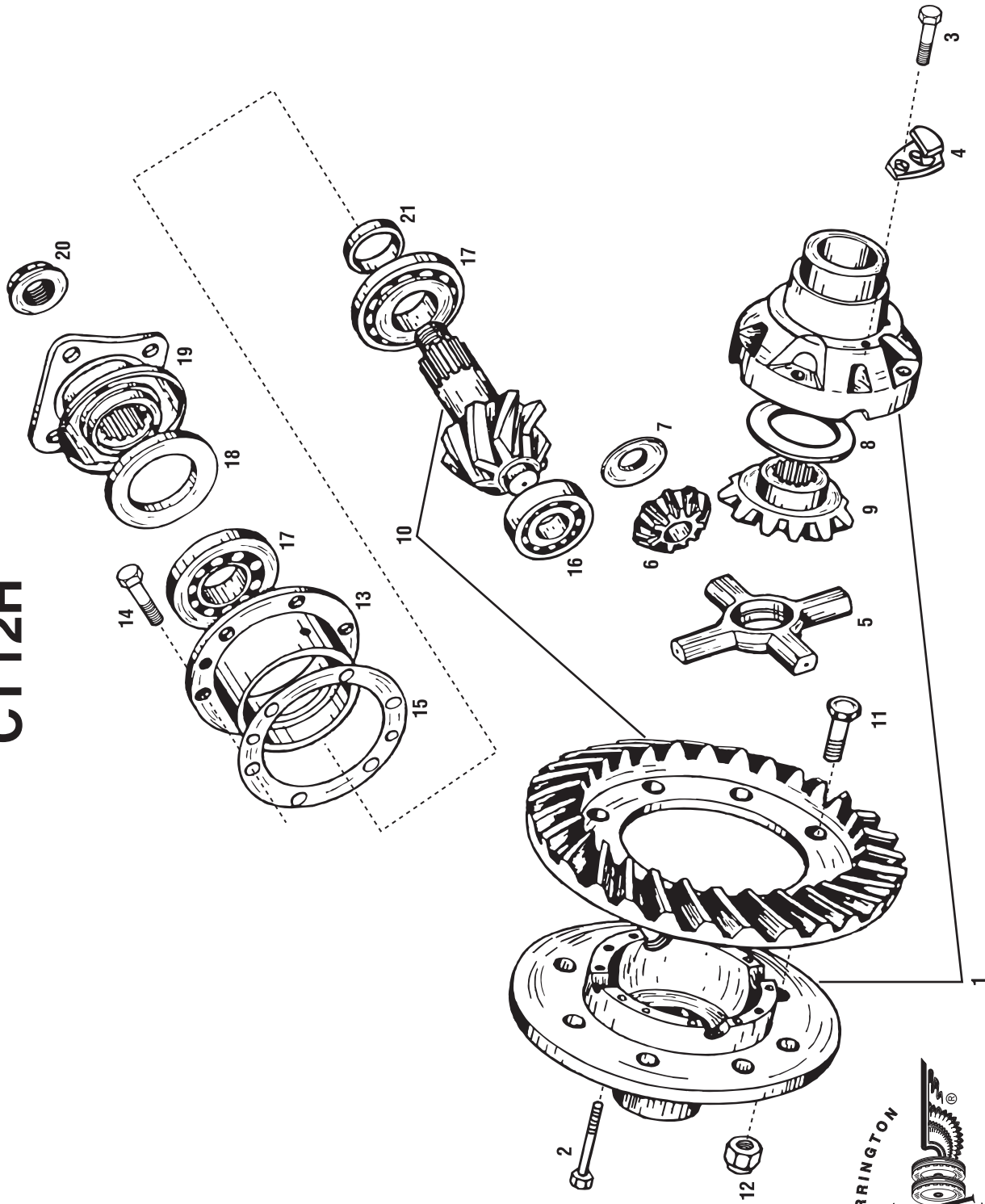
ITEM NO.	MH PART NO.	DESCRIPTION	QTY. REQ.	ITEM NO.	MH PART NO.	DESCRIPTION	QTY. REQ.
1	CT12-1040	Differential Carrier Housing Assy.	1				
2	CT12-1078	Flanged Bolt, Special	4				
3	CT12-1077	Flanged Bolt, Special	8				
4	MT10-1041	Hex Bolt, Special	4				
5	CT8-1054	Washer	4				
6	MT10-1043	Taper Roller Bearing	2				
7	MT10-1044	Bearing Adjuster	2				
8	MT22-1080	Adjuster Lock Plate	1				
9	11500773	Hex Bolt, M8x16-1.25	4				

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**DIFFERENTIAL CARRIER HOUSING
CT12H**



DIFFERENTIAL CT12H



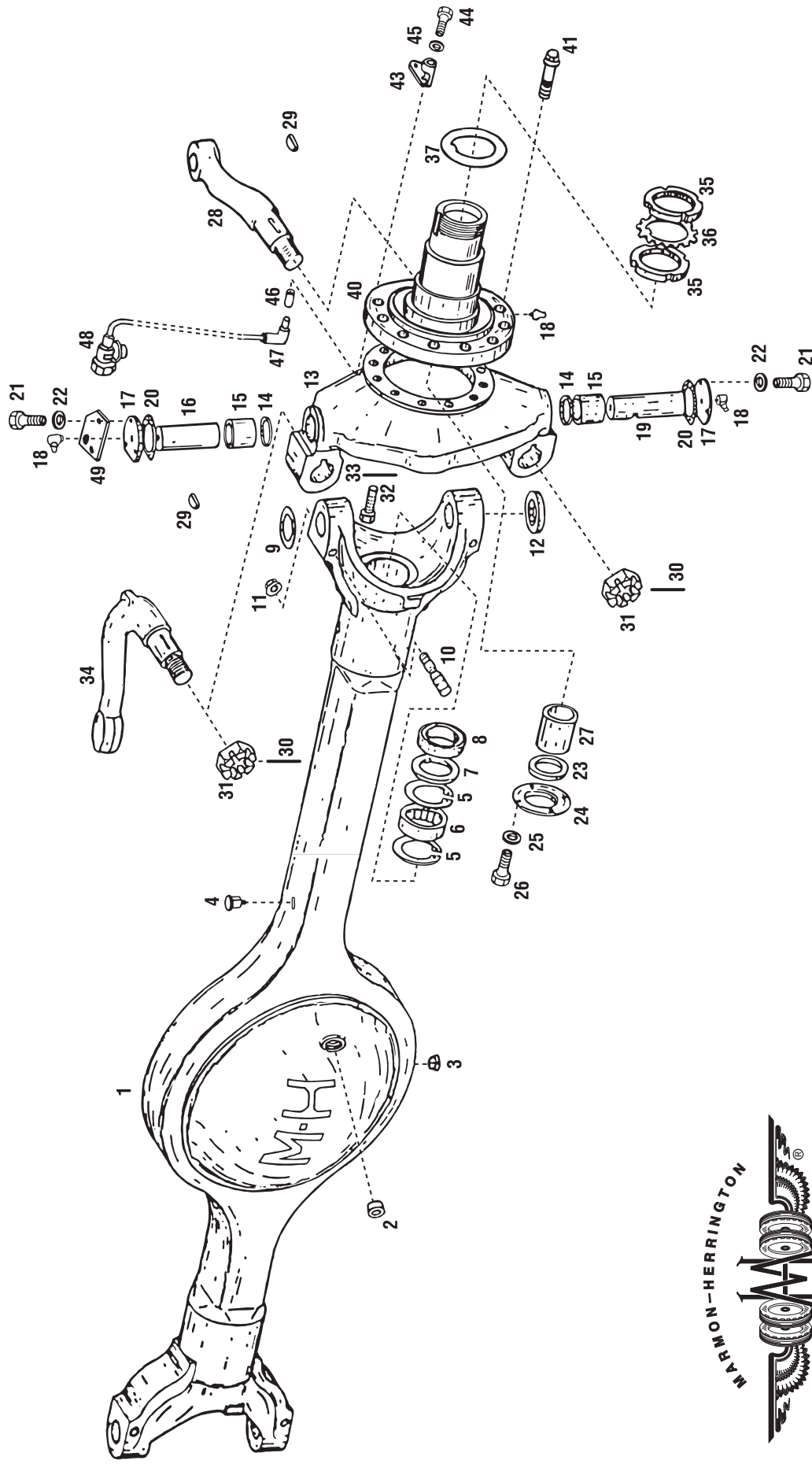
COMPLETE CARRIER ASSEMBLY				ITEM NO.	MH PART NO.	DESCRIPTION	QTY. REQ.
CARRIER P/N	PINION & RING GEAR RATIO	DIFFERENTIAL CASE					
CT12-1011	4.11	CT12-1021		11	MT10-1062	Hex Bolt, Special	8
CT12-1012	4.33	CT12-1021		12	MT10-1063	Self-Lock Nut	8
CT12-1001	4.62	CT12-1021		13	CT12-1064	Bearing Cage	1
CT12-1013	4.78	CT12-1021		14	MT10-1065	Flanged Bolt, Special	6
CT12-1002	4.88	CT12-1021		15	MT10-1066A	Shim, 1.00 MM	AR
CT12-1003	5.29	CT12-1021			MT10-1066B	Shim, 0.50 MM	AR
CT12-1015	5.38	CT12-1023			MT10-1066C	Shim, 0.30 MM	AR
CT12-1004	5.57	CT12-1023			MT10-1066D	Shim, 0.20 MM	AR
CT12-1005	5.86	CT12-1023			MT10-1066E	Shim, 0.15 MM	AR
CT12-1006	6.14	CT12-1023		16	CT8-1072	Roller Bearing	1
CT12-1009	6.50	CT12-1023		17	MT10-1068	Pinion Bearing, Inner and Outer	2
CT12-1007	6.83	CT12-1023		18	MT10-1069	Oil Seal, Pinion	1
CT12-1008	7.17	CT12-1023		19	CT12-1071	Companion Flange	1
				20	CT12-1072	Self-Lock Nut	1
				21	MT10-1074A	Pinion Bearing Spacer, 13.950 MM	AR*
					MT10-1074B	Pinion Bearing Spacer, 13.975 MM	AR*
					MT10-1074C	Pinion Bearing Spacer, 14.000 MM	AR*
					MT10-1074D	Pinion Bearing Spacer, 14.025 MM	AR*
					MT10-1074E	Pinion Bearing Spacer, 14.050 MM	AR*
					MT10-1074F	Pinion Bearing Spacer, 14.075 MM	AR*
					MT10-1074G	Pinion Bearing Spacer, 14.100 MM	AR*
					MT10-1074H	Pinion Bearing Spacer, 14.125 MM	AR*
					MT10-1074I	Pinion Bearing Spacer, 14.150 MM	AR*
					MT10-1074J	Pinion Bearing Spacer, 14.175 MM	AR*
					MT10-1074K	Pinion Bearing Spacer, 14.200 MM	AR*
					MT10-1074L	Pinion Bearing Spacer, 14.225 MM	AR*
					MT10-1074M	Pinion Bearing Spacer, 14.250 MM	AR*
					MT10-1074N	Pinion Bearing Spacer, 14.275 MM	AR*
					MT10-1074P	Pinion Bearing Spacer, 14.300 MM	AR*
					MT10-1074Q	Pinion Bearing Spacer, 14.325 MM	AR*
					MT10-1074R	Pinion Bearing Spacer, 14.350 MM	AR*
					MT10-1074S	Pinion Bearing Spacer, 14.375 MM	AR*
					MT10-1074T	Pinion Bearing Spacer, 14.400 MM	AR*
					MT10-1074U	Pinion Bearing Spacer, 14.425 MM	AR*
					MT10-1074V	Pinion Bearing Spacer, 14.450 MM	AR*
					MT10-1074W	Pinion Bearing Spacer, 14.475 MM	AR*
					MT10-1074X	Pinion Bearing Spacer, 14.500 MM	AR*
					MT10-1074Y	Pinion Bearing Spacer, 14.525 MM	AR*
					MT10-1074Z	Pinion Bearing Spacer, 14.550 MM	AR*
						AR = As Required	
						*Note: Choose 2 to produce proper bearing preload.	



DIFFERENTIAL CT12H

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AXLE HOUSING CT12H



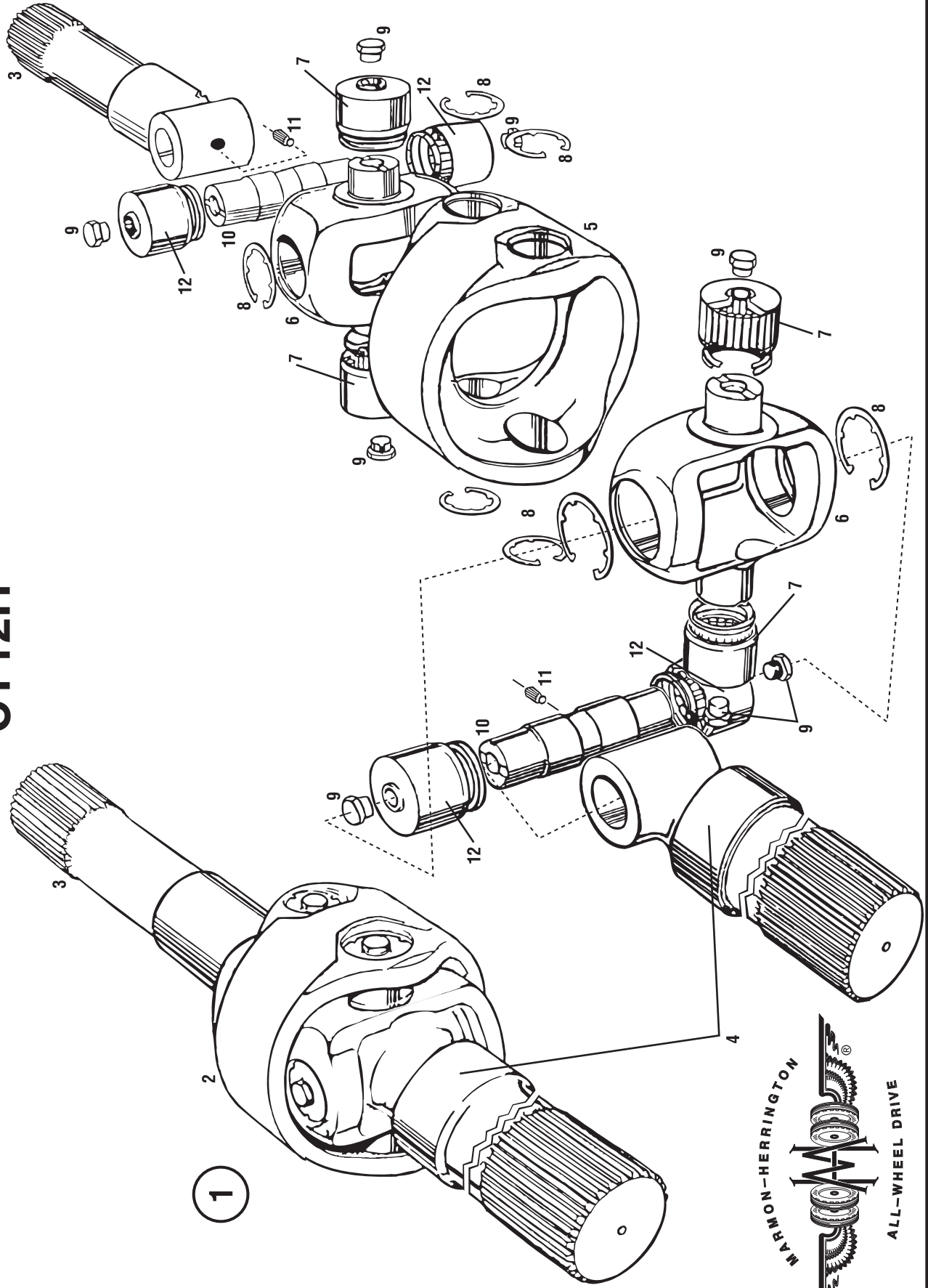
ITEM NO.	MH PART NO.	DESCRIPTION	QTY. REQ.	ITEM NO.	MH PART NO.	DESCRIPTION	QTY. REQ.
1	CT12-1075	Axle Housing	1	27	MT10-1095	Bushing	2
2	MT14-1070	Fill Plug	1	28	MT10-1096	Tie-Rod Arm, L.H.	1
3	MT14-1071	Magnetic Drain Plug, M24x1.5	1	MT10-1137	Tie-Rod Arm, R.H.	1	
4	MT14-1068	Vent	1	MT93-2308	Key	3	
5	MT10-1076	Snap Ring	4	103415	Cotter Pin	3	
6	MT10-1077	Cylindric Roller Bearing	2	MT10-1099	Castle Nut	3	
7	MT22-1116	Oil Seal	2	MT10-1100	Turn Stop Bolt	2	
8	MT10-1079	Oil Seal Support Assy.	2	MT10-1101	Jam Nut	2	
	MT10-1080	Felt Wiper	2	MT93-2307	Steering Arm	1	
9	MT10-1081A	Shim, 0.40 MM	AR	MT22-1132	Spindle Nut	4	
	MT10-1081B	Shim, 0.60 MM	AR	MT22-1133	Lock Plate	2	
	MT10-1081C	Shim, 1.00 MM	AR	MT10-1103	Lock Disk	2	
	MT10-1081D	Shim, 1.20 MM	AR	MT10-1108	Spindle, L.H.	1	
	MT10-1081E	Shim, 1.40 MM	AR	MT10-1109	Spindle, R.H.	1	
10	MT10-1132	Lock Pin	4	MT10-1105	Hex Flange Bolt	24	
11	MT10-1133	Flanged Nut	4	MT93-1109	Sensor Holder	2	
12	MT10-1082	Taper Roller Thrust Bearing	2	11500713	Hex Bolt	4	
13	MT10-1150	Steering Knuckle Assy., L.H.	1	11500191	Lock Washer	4	
	MT10-1084	Steering Knuckle Assy., R.H.	1	MT93-1283	Clamp Sleeve	2	
14	MT10-1087	Grease Seal	4	CT8-1091	Revolution Sensor	2	
15	MT10-1088	Bushing-Knuckle Pin	4	CT8-1092	Connecting Holder	1	
16	MT10-1089	Kingpin Upper	2	CT8-1093	Holder Plate	2	
17	MT10-1090	Cap	4				
18	MT14-1119	Grease Fitting 45°	6				
19	MT10-1091	Kingpin Lower	2				
20	MT10-1092	Gasket	4				
21	11500716	Hex Bolt	12				
22	11500191	Lock Washer	12				
23	MT14-1092	Oil Seal	2				
24	MT10-1094	Dust Plate	2				
25	11500190	Lock Washer	8				
26	11503946	Hex Bolt, M6x12	8				
						AR = As Required	

AXLE HOUSING CT12H

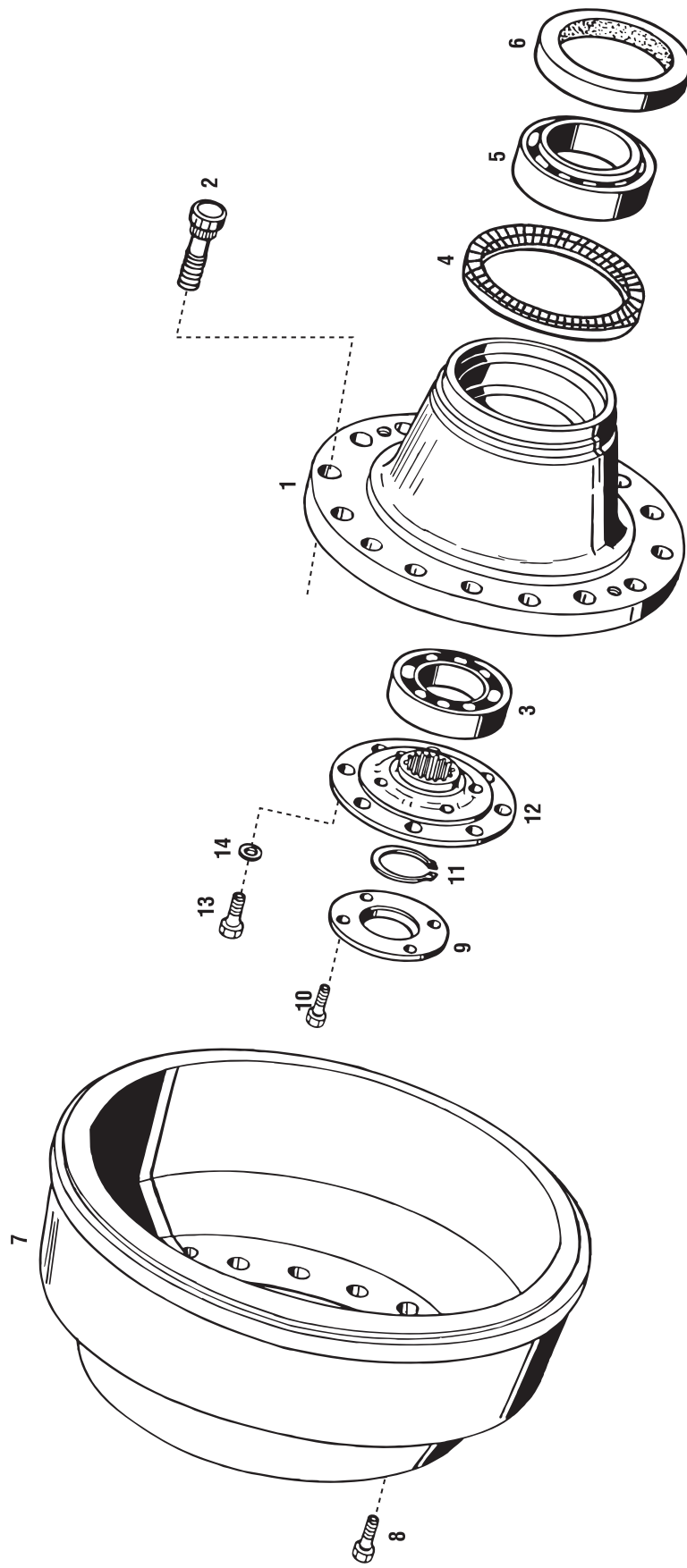
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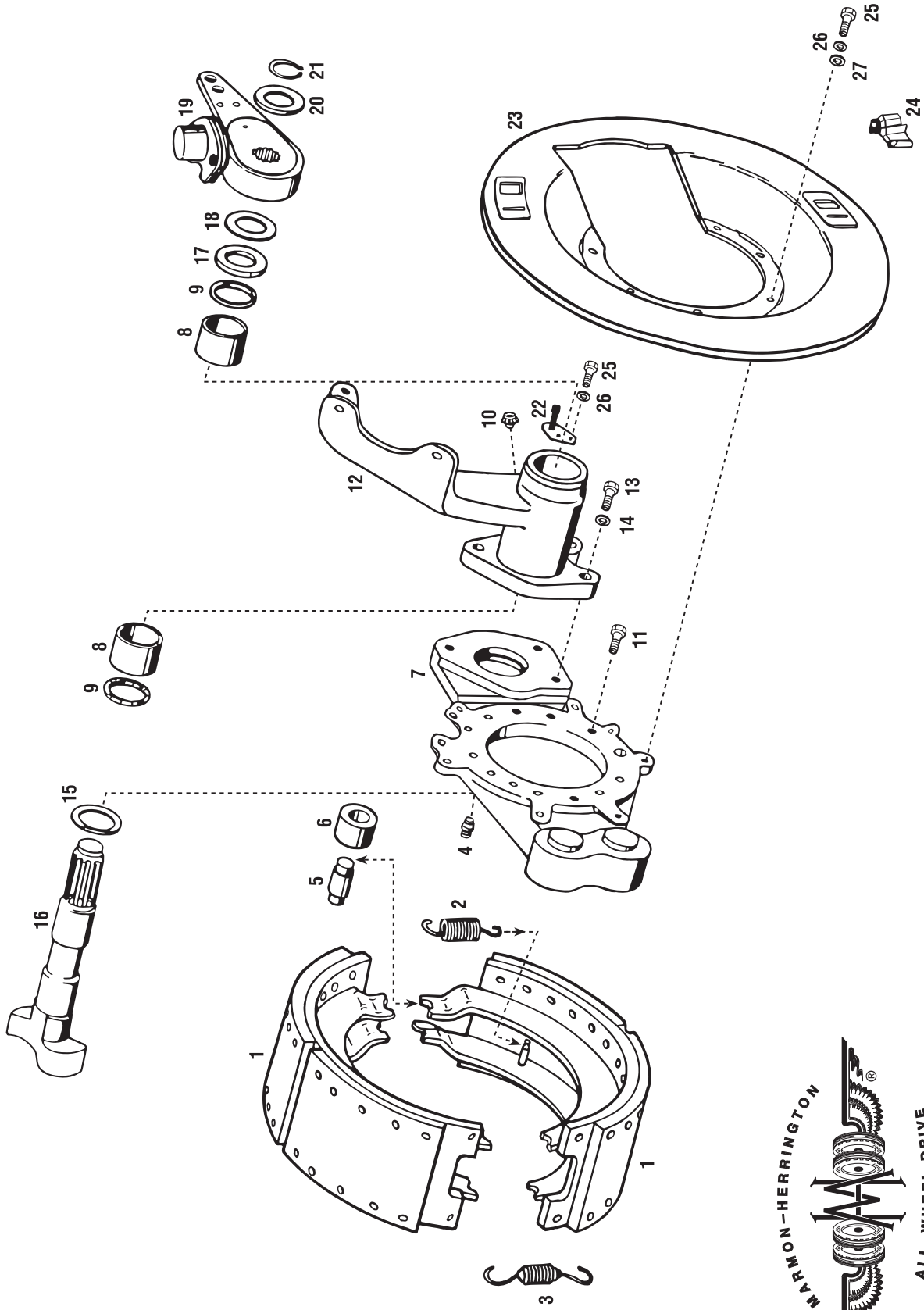
AXLE SHAFT ASSEMBLY CT12H



WHEEL HUB, BRAKE DRUM CT12H



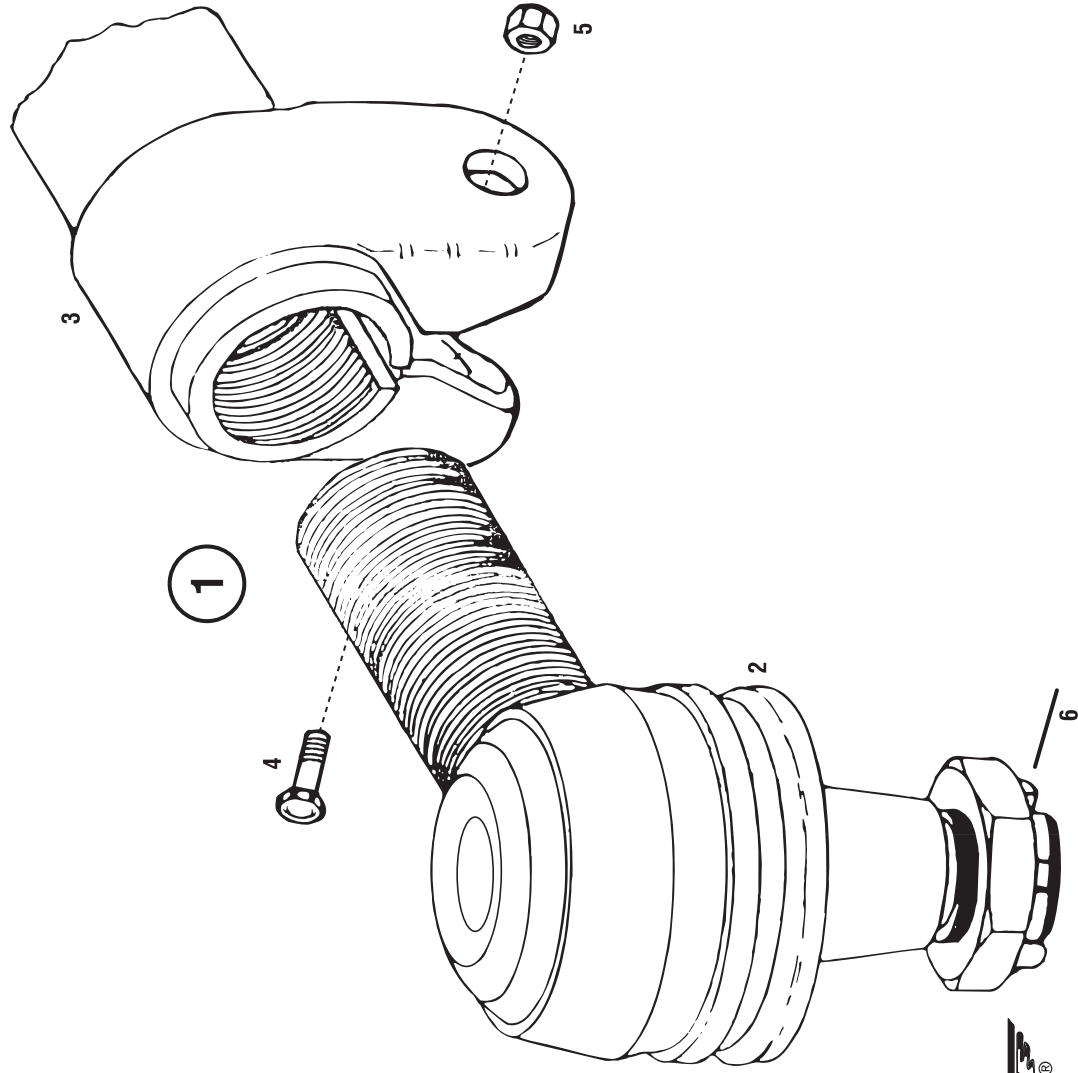
BRAKE CT12H



ITEM NO.	MH PART NO.	DESCRIPTION	QTY. REQ.	ITEM NO.	MH PART NO.	DESCRIPTION	QTY. REQ.
1	CT12-1164	Brake Shoe Assembly	4				
2	MT14-1157	Return Spring, Short	4				
3	MT14-1156	Return Spring, Swivel-Ends	4				
4	MT11-1004	Spring Support Pin	4				
5	MT11-1005	Roller Pin	4				
6	MT11-1006	Brake Shoe Roller	4				
7	MT11-1007	Brake Support, LH	1				
8	MT11-1008	Brake Support, RH	1				
9	MT22-1179	Bushing	4				
10	MT14-1132	Oil Seal	4				
11	MT10-1105	Grease Fitting	2				
12	MT11-1010	Hex Bolt	24				
13	MT11-1011	Air Chamber Bracket, LH Assy.	1				
14	MT11-1012	Air Chamber Bracket, RH Assy.	1				
15	MT22-1183	Hex Bolt	6				
16	11500194	Lock Washer	6				
17	MT14-1142	Spacer	2				
18	MT11-1012	Camshaft, LH	1				
19	MT11-1013	Camshaft, RH	1				
20	MT11-1014	Spacer	2				
21	MT11-1015	Shim, 0.5 MM	AR				
22	MT11-1123	Auto Slack Adj., LH (MT11N/H/CT12N/H)	1				
23	MT11-1124	Auto Slack Adj., RH (MT11N/H/CT12N/H)	1				
24	MT11-1017	Washer	2				
25	MT11-1018	Snap Ring	2				
26	MT22-1239	Auto Slack Stop, LH	1				
27	MT22-1240	Auto Slack Stop, RH	1				
28	MT11-1019	Dust Shield	2				
29	MT11-1020	Rubber Plug	4				
30	11500773	Hex Bolt M8x16	14				
31	11500191	Lock Washer M8	14				
32	11500289	Washer M8	10				
						AR = As Required	



TIE-ROD CT12H





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