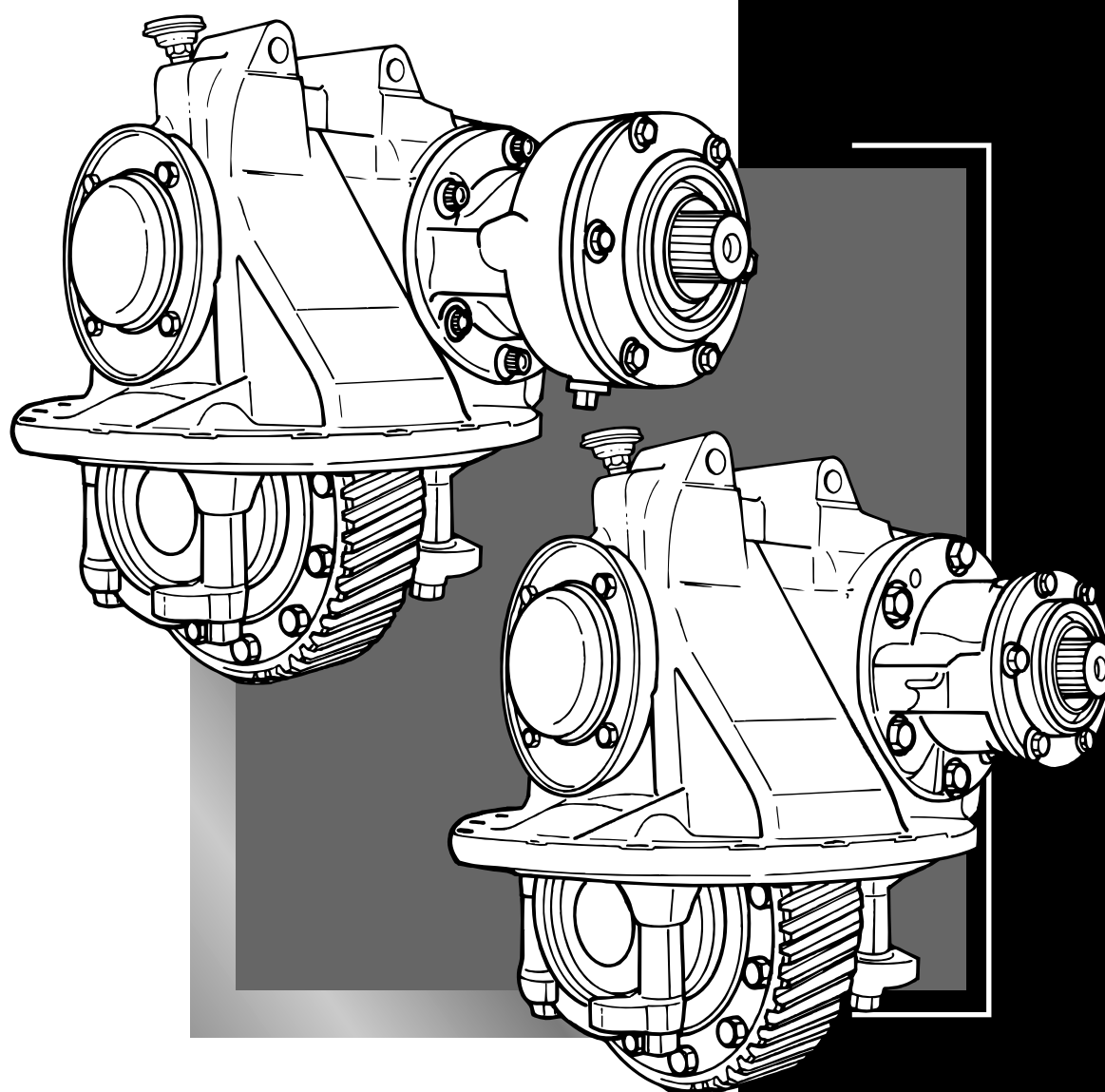
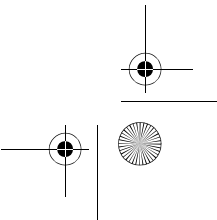
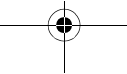
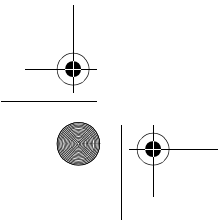
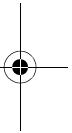
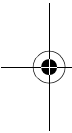
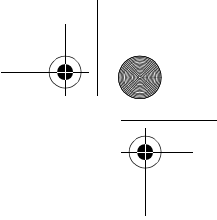
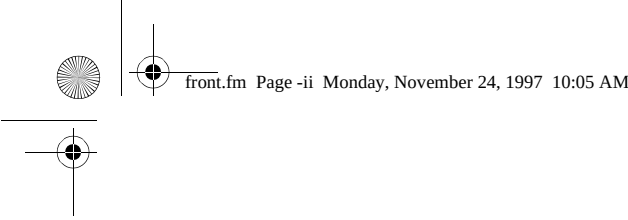




**MACK DUAL
REDUCTION
TANDEM
CARRIER
92/93 AND 112/113 SERIES**



DECEMBER 1997
(REVISED)
13-105





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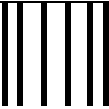
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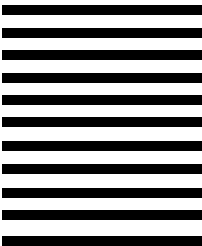


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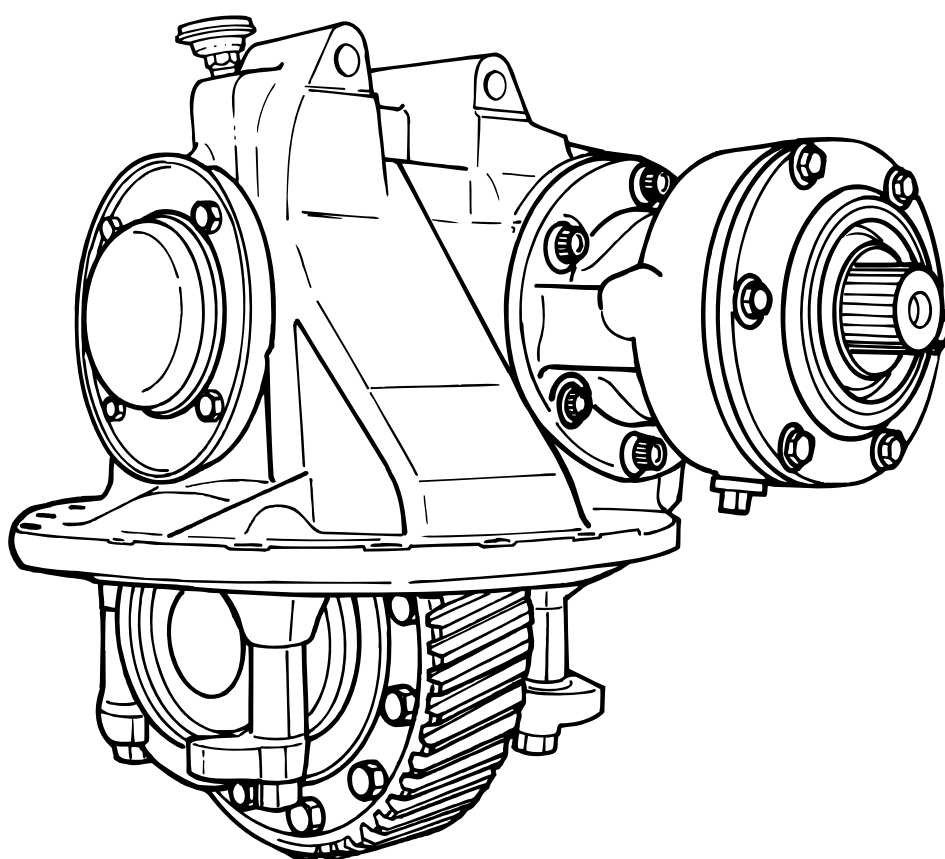
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MACK DUAL REDUCTION **TANDEM CARRIER** 92/93 AND 112/113 SERIES



DECEMBER 1997
(REVISED)

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13-105



ATTENTION

The information in this manual is not all inclusive and cannot take into account all unique situations. Note that some illustrations are typical and may not reflect the exact arrangement of every component installed on a specific chassis.

The information, specifications, and illustrations in this publication are based on information that was current at the time of publication.

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SAFETY INFORMATION

SAFETY INFORMATION



SAFETY INFORMATION

Advisory Labels

Cautionary *signal words* (Danger-Warning-Caution) may appear in various locations throughout this manual. Information accented by one of these signal words must be observed to minimize the risk of personal injury to service personnel, or the possibility of improper service methods which may damage the vehicle or render it unsafe. Additional Notes and Service Hints are utilized to emphasize areas of procedural importance and provide suggestions for ease of repair. The following definitions indicate the use of these advisory labels as they appear throughout the manual:

CAUTION

Directs attention to unsafe practices which could result in damage to equipment and possible subsequent personal injury or death if proper precautions are not taken.

WARNING

Directs attention to unsafe practices which could result in personal injury or death if proper precautions are not taken.

DANGER

Directs attention to unsafe practices and/or existing hazards which will result in personal injury or death if proper precautions are not taken.

NOTE

An operating procedure, practice, condition, etc., which is essential to emphasize.

SERVICE HINT

A helpful suggestion which will make it quicker and/or easier to perform a certain procedure, while possibly reducing overhaul cost.

000001a



SAFETY INFORMATION

Service Procedures and Tool Usage

Anyone using a service procedure or tool not recommended in this manual must first satisfy himself thoroughly that neither his safety nor vehicle safety will be jeopardized by the service method he selects. Individuals deviating in any manner from the instructions provided assume all risks of consequential personal injury or damage to equipment involved.

Also note that particular service procedures may require the use of a special tool(s) designed for a specific purpose. These special tools must be used in the manner described, whenever specified in the instructions.

W A R N I N G

1. Before starting a vehicle, always be seated in the driver's seat, place the transmission in neutral, be sure that parking brakes are set, and disengage the clutch.
2. Before working on a vehicle, place the transmission in neutral, set the parking brakes, and block the wheels.
3. Before towing the vehicle, place the transmission in neutral and lift the rear wheels off the ground, or disconnect the driveline to avoid damage to the transmission during towing.

**REMEMBER,
SAFETY . . . IS NO ACCIDENT!**



NOTES



EXPLANATION OF NUMERICAL CODE

EXPLANATION OF NUMERICAL CODE



EXPLANATION OF NUMERICAL CODE

EXPLANATION OF 3-DIGIT NUMERICAL CODE

The organization of Mack® service manuals has been upgraded to standardize manual content according to a reference system based on component identification. The new reference system will help to link the information contained in this publication with related information included in other Mack service-warranty publications, such as associated service bulletins, warranty manuals, and the TS477 Labor Time Standards Manual.

The system is based on a numerical code, the first **digit** of which identifies the general component grouping as listed here:

- GROUP 000 — INSPECTIONS & MISCELLANEOUS
- GROUP 100 — CHASSIS
- GROUP 200 — ENGINE

- GROUP 300 — CLUTCH, TRANSMISSION, TRANSFER CASE AND PTO
- GROUP 400 — STEERING, AXLES, WHEELS AND TIRES, DRIVELINE
- GROUP 500 — BRAKES, AUXILIARY SYSTEMS
- GROUP 600 — CAB, TRUCK BODY
- GROUP 700 — ELECTRICAL

The second two digits of the 3-digit code are used to identify the **system, assembly** or **subassembly**, as appropriate, within each of the groupings. The codes applicable to this publication are shown at the TOP OF EACH PAGE and at SECTION HEADINGS as necessary, and may also appear in the TABLE OF CONTENTS, to guide you to specific component information.

Additionally, a two-character alpha code (i.e. [CF] CARRIER ASSEMBLY) may be shown with an operation. This alpha code, in combination with the three-digit Group number, identifies the specific assembly, subassembly or part, and directly relates to the first five positions of operation code listed in the Service Labor Time Standards Manual, TS477.

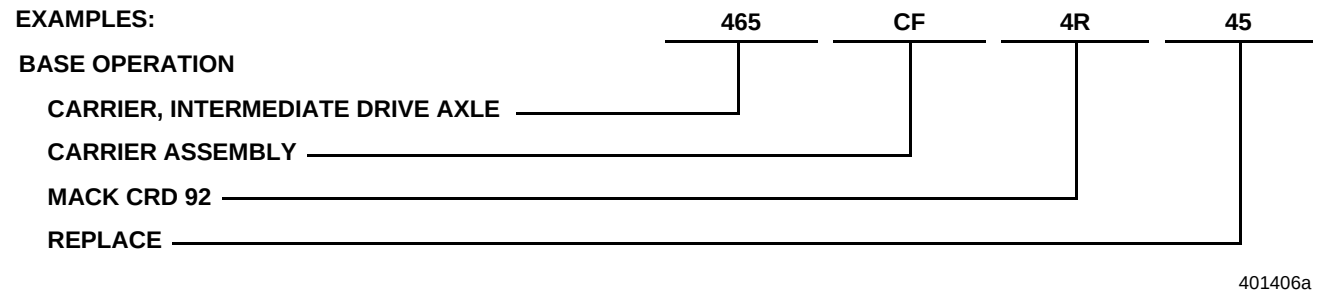




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NOTES



400 INTRODUCTION

INTRODUCTION



400 INTRODUCTION

MACK DUAL-REDUCTION TANDEM CARRIER

MACK top-mounted, dual-reduction tandem carriers of the 92/93 or 112/113 series transfer the power from the transmission to the rear wheels. The carriers are identical except for the input drive and the through-shaft arrangement of the front carrier, which differs from the input pinion mounting of the rear unit.

Front Rear Carrier

Most MACK four-wheel-drive tandems are provided with a MACK inter-axle power divider, which can be defined as a third differential. The exclusive MACK inter-axle power divider splits driving torque evenly or unevenly, as required between the tandem axles. This power divider is fully automatic, contains no gears and preserves traction in the toughest conditions. MACK power dividers automatically provide a 3-to-1 torque biasing capability to the axle with the best traction.

During certain off-highway (low traction) situations, there is an advantage to coupling the tandem carriers together in a straight-through positive drive arrangement. An optional power divider with lockout feature is available for this purpose. The driver can control the power divider lockout from the cab of the vehicle. The lockout consists of an air-actuated piston assembly which controls a shift fork and gear-type sliding clutch. The clutch is splined to the cage assembly and is moved to engage with the outer cam of the power divider. This couples the cage and outer cam together and effectively locks out the function of the power divider for emergency traction situations.

Tire matching is still required on units with or without an inter-axle power divider as mismatched tires equates to mismatched ratios. Tire matching is required with a power divider or premature unit failure will occur.

Other carriers are available without the inter-axle power divider, in which case the carriers are coupled together in a straight-through drive arrangement. This combination is quite rare and will not be covered in this manual.

Rear Rear Carrier

In the rear rear carrier, the main drive pinion has a solid shank and is carried in an overhung arrangement by a pair of tapered roller bearings mounted in a separable housing.

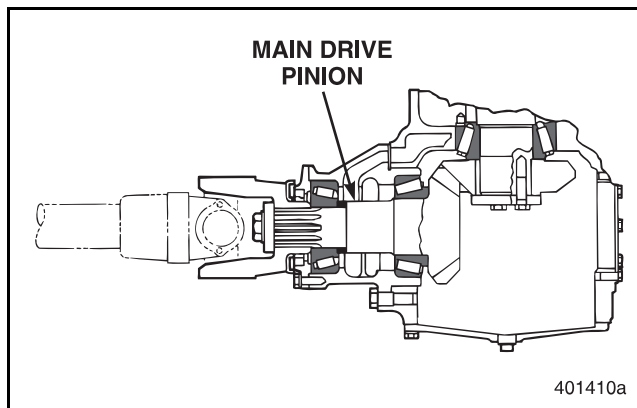


Figure 1 — Rear Rear Carrier Arrangement

Another important feature of both the front rear and rear carriers is the inter-wheel or differential power divider with a command wedge-type differential, instead of the conventional gear-type differential. Similar to the inter-axle power divider the inter-wheel power divider is also fully automatic, contains no gears and provides a 3-to-1 torque biasing capability to the wheel with the best traction.

Features

Current production dual-reduction carriers are provided with:

- Durapoid spiral bevel gears for first reduction
- Coarse-pitch, wide-faced helical gearset for second reduction
- Four-pinon, closed-type gear differential (unless otherwise specified)

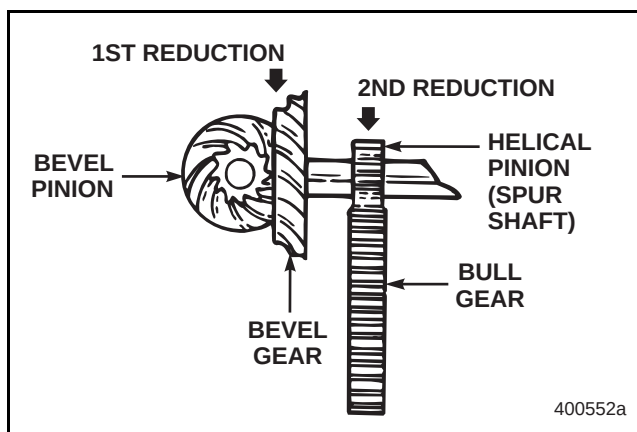


Figure 2 — Dual-Reduction Carrier



400 CARRIER VISUAL IDENTIFICATION

CARRIER VISUAL IDENTIFICATION



400 CARRIER VISUAL IDENTIFICATION

CARRIER IDENTIFICATION

Before disassembly, determine which type of carrier is being serviced. Carriers use the designations shown in Figure 3 to define specific descriptive information.

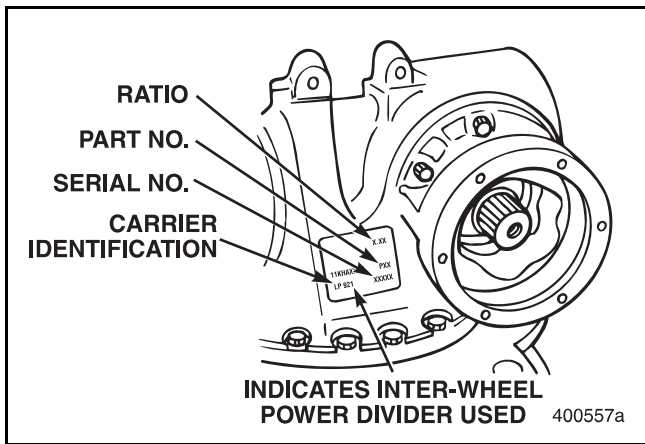


Figure 3 — Carrier Stamping Location and Information

Information stamped into the unit indicates features included by the manufacturer.

Power Divider Identification

Pay special attention to units with the initial “P” and the numeral “1”. The letter “P” in the prefix indicates that the carrier is equipped with an inter-axle power divider. The numeral “1” after the model number indicates that the carrier is equipped with an inter-wheel power-divider type differential. Absence of the numeral “1” indicates that a four-pinion type differential is used.

Each type of differential is covered in its own disassembly and reassembly section. Refer only to the section covering the particular type of carrier being serviced.

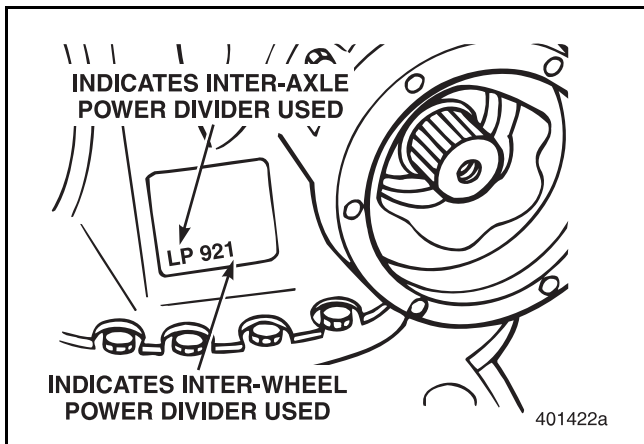


Figure 4 — Power Divider Stamping Locations



400 DESCRIPTION AND OPERATION

DESCRIPTION AND OPERATION



400 DESCRIPTION AND OPERATION

POWER DIVIDER OPERATION

The power divider is a torque-proportioning differential that prevents loss of traction by directing up to 75 percent of the total available torque to the axle with the best traction. By the nature of its design, a conventional differential will either apply torque to the axle or the wheel with the least resistance or equally distribute torque if resistance is equal at all wheels. When good traction conditions exist, a resistance occurs at each wheel, transmitting torque equally to all wheels. However, when an axle or wheel loses traction (resistance) the other wheel with good traction only receives a torque equal to the torque capacity of the spinning wheel. Commonly this is not enough to move the vehicle and the majority of the available torque is lost at the spinning wheel. When this same situation occurs with the MACK power divider, power is automatically diverted to the non-spinning wheel(s) for maximum traction.

Inter-Axle Power Divider

The MACK inter-axle power divider provides torque biasing between axles of the tandem rear carrier. If one axle (one or both wheels of the axle) has limited traction, the torque applied to each wheel of the axle is immediately multiplied by three and transferred to the axle with more traction. Even when no traction is available at the spinning wheel, the operator can apply the brakes slightly, creating enough resistance at that wheel to allow power to the axle with traction.

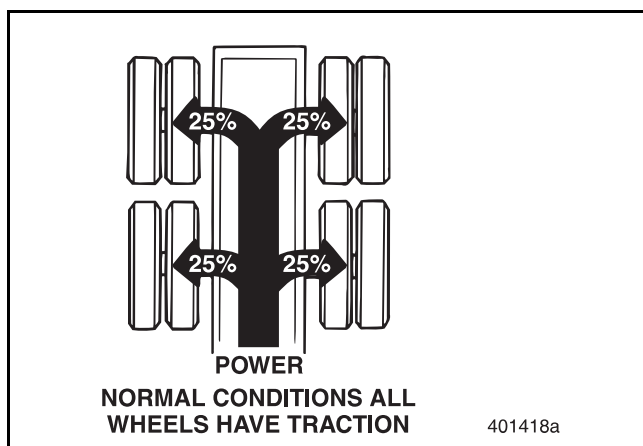


Figure 5 — Normal Traction Conditions

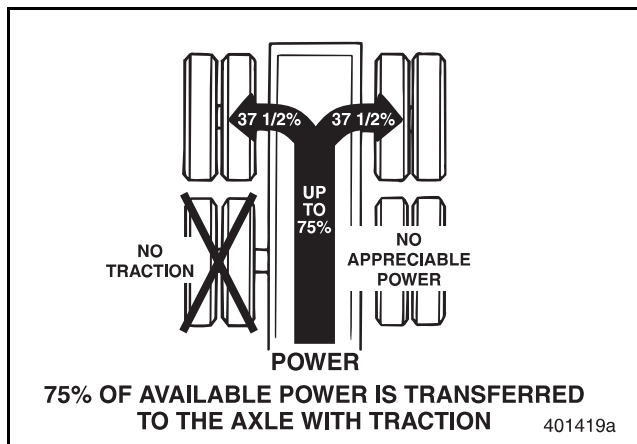


Figure 6 — Axle Loss of Traction

Inter-Wheel Power Divider

The MACK inter-wheel power divider functions in much the same manner as the inter-axle power divider with torque biasing occurring from wheel to wheel. The inter-wheel power divider may be used in conjunction with the inter-axle power divider to provide increased maneuverability in poor traction situations.

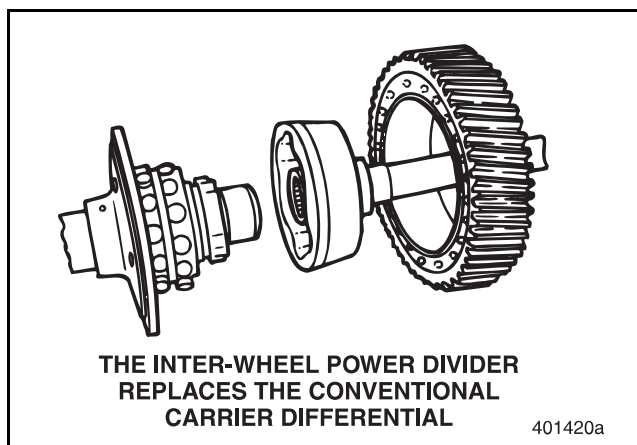


Figure 7 — Inter-Wheel Power Divider

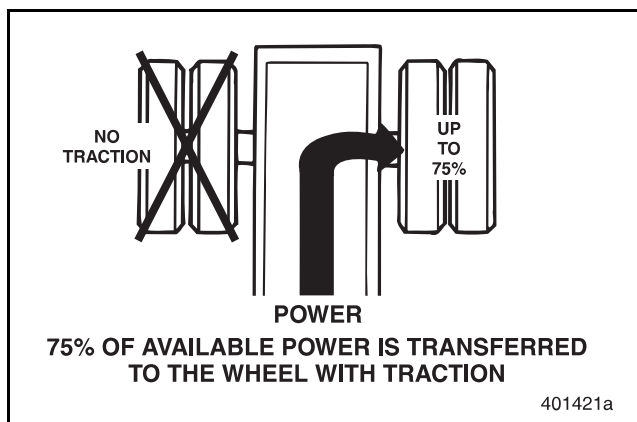


Figure 8 — One Wheel Loss of Traction



400 DESCRIPTION AND OPERATION

Power Divider Lockout

A power divider lockout is available for exceptionally severe operating conditions, where road surfaces are so slippery that traction is difficult to achieve even with the MACK power divider. The advantage of the power divider lockout is that tandem carriers can be coupled together in a straight-through positive drive arrangement, thus enabling the operator to achieve maximum traction under these severe conditions. For this type of operation, a lockout

device, controlled from the cab by the driver, may be incorporated with the power divider.

The lockout device inhibits the operation of the power divider. It consists of an air-actuated, gear-type sliding clutch which, when engaged, couples the cage to the outer cam to effectively lock out the function of the power divider differential as shown in Figures 9 and 10.

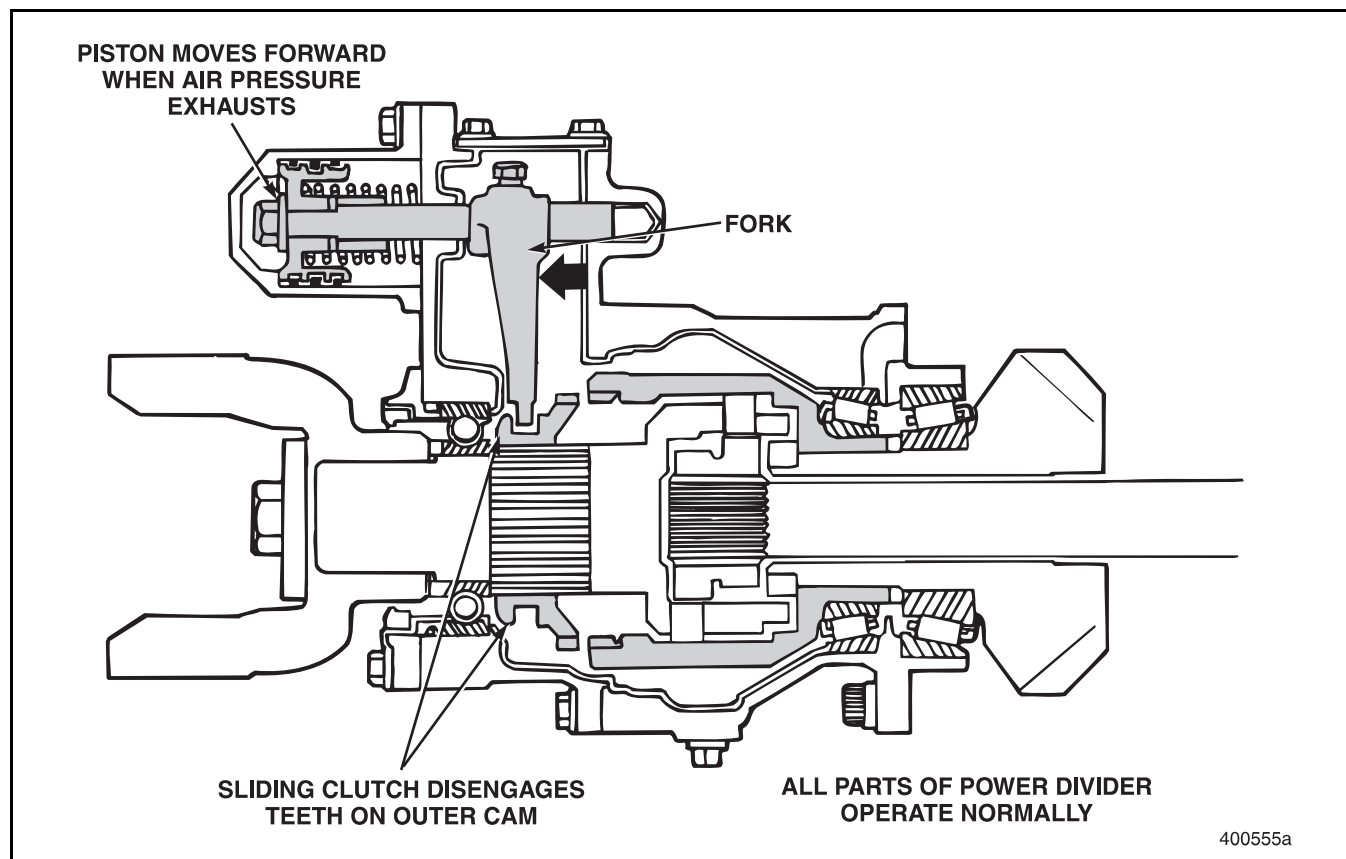


Figure 9 — Inter-Axle Power Divider Lockout Disengaged



400 DESCRIPTION AND OPERATION

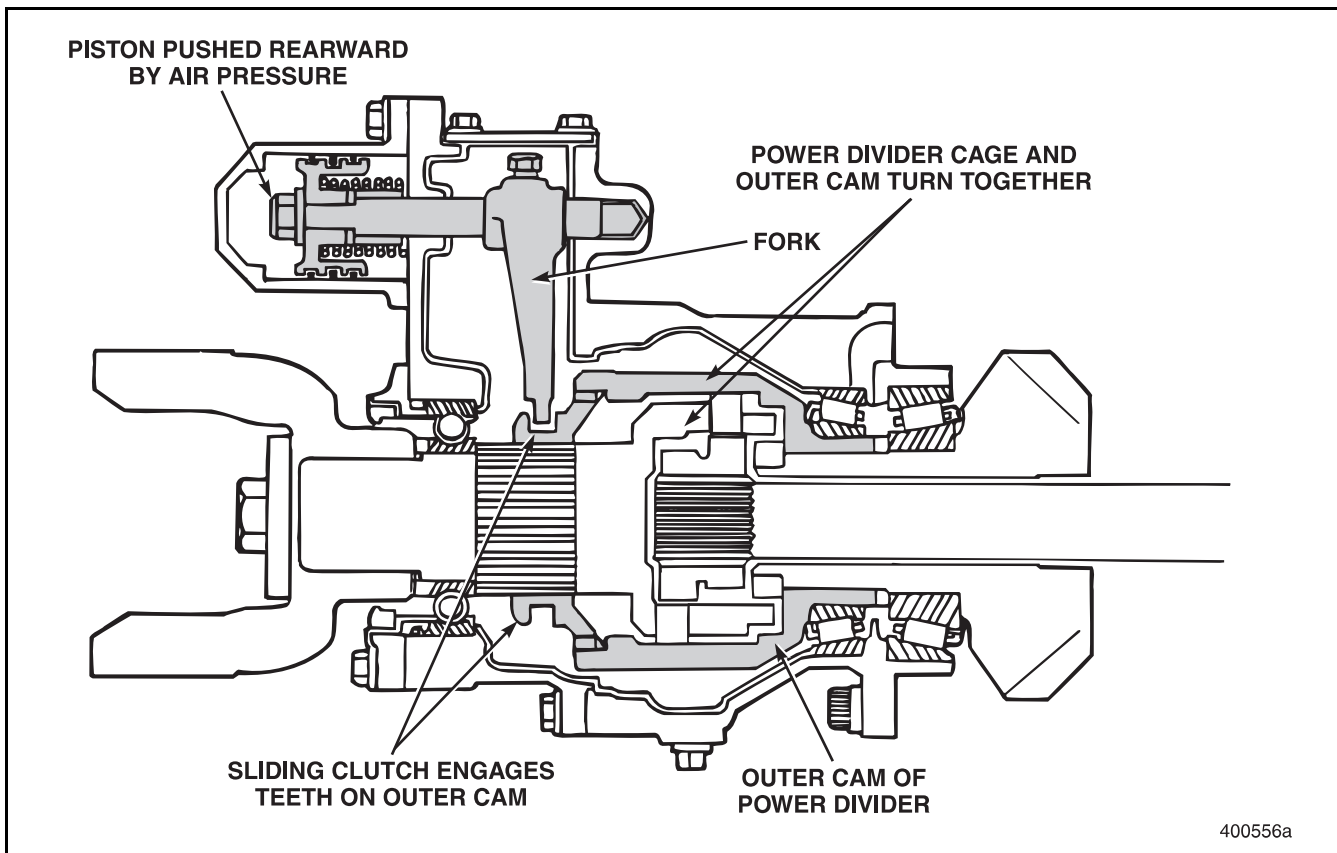


Figure 10 — Inter-Axle Power Divider Lockout Engaged

The power divider and lockout are mounted in separate housings. The power divider housing also contains the hollow bevel pinion, carried in an overhung arrangement by a pair of tapered roller bearings and the through shaft in quill arrangement.

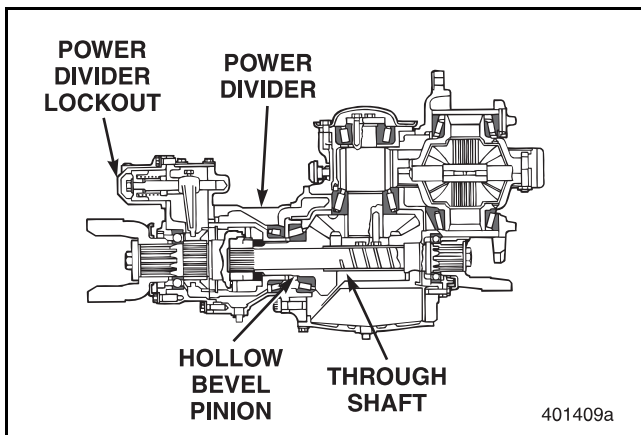


Figure 11 — Front Rear Carrier Arrangement



400 DESCRIPTION AND OPERATION

CARRIER COMPONENTS AND OPERATION

Except for the differences just noted, both carriers are the same. The helical pinion shaft and Durapoid bevel gear are mounted at right angles to the bevel pinion shaft. Both components are straddle-mounted by a pair of tapered roller bearings mounted at the gear end in the carrier housing bulkhead and at the outer end in a separable bearing retainer. Proper bevel gear mesh is achieved by varying the thickness of shim packs between the pinion gear housings and the carrier housing. The mating bevel gear must be adjusted to the proper backlash.

Differential Components and Operation

The differential assembly consists of four bevel pinions in steel-on-steel bearing engagement with the spider and two axle-driving side gears with steel-backed, ball-indented thrust washers behind pinions and side gears. Lubricant trapped in the ball indentations forms small reservoirs which provide adequate lubrication at these points when differential action is taking place. These parts are enclosed in the differential casing consisting of two mated halves. In addition to the bolting flange of the RH casing half, a ring of splines around the circumference engages mating splines on the inside diameter of the bull gear bolting flange. When assembled, driving torque from the bull gear is transferred to the differential casing through the splines. This relieves the bull gear mounting capscrews of all shearing stresses.

The entire assembly is straddle mounted in a pair of tapered roller bearings, one at each outer end of the casing halves. The bearings are mounted in the carrier pedestals. Bearing preloading is accomplished by a slotted adjusting nut threaded to the inboard side of the RH bearing cup which is otherwise free to move laterally. The LH bearing cup flange holds itself stationary against the LH bearing pedestal leg.

Lubrication

When the vehicle is in motion, all moving parts in both tandem carriers are constantly bathed in oil by the various pumping actions of the moving parts.

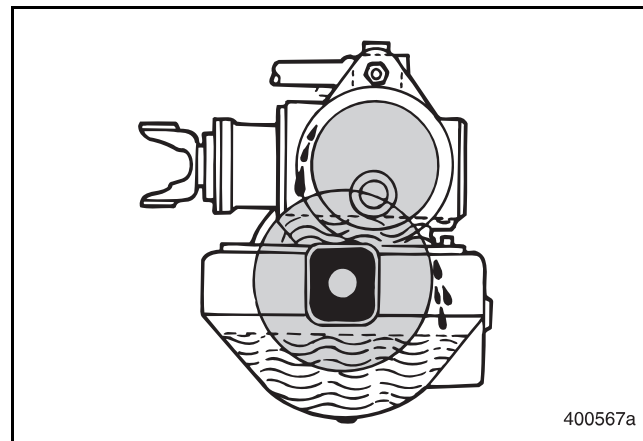


Figure 12 — Splash Lubrication

A pump on the rear half of the inter-axle through shaft sends oil under pressure to the inter-axle power divider. The entire length of the pump is enclosed in a close-fitting tube, anchored to the rear bearing retainer and oil trough assembly for the through shaft.

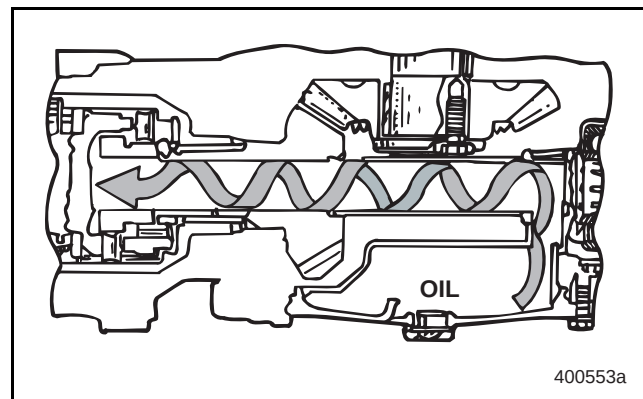


Figure 13 — Inter-Axle Power Divider Pump Operation



400 DESCRIPTION AND OPERATION

A collector trough, integral with the bevel-gear compartment cover, supplies the pump intake port on top of the rear bearing retainer with lubricant collected from bevel gear throw-off. In forward vehicle motion, the helix hand of the pump forces oil forward along the through shaft between the tube and hollow-bevel pinion shaft to the internal parts of the power divider. The oil returns to the banjo reservoir by the pumping action of the parts and through drilled passages in the housings.

Another collector trough, integral with the carrier housing, directs throw-off oil from the Durapoid gearset directly to the drive-pinion tapered roller bearings through drilled and cast-in oil passages. This oil returns to the reservoir by gravity. All other gears and bearings are lubricated by their own pumping action created when running in oil.

NOTE

This information applies to all 92/93 and 112/113 series top-mounted, dual-reduction, tandem carriers. This includes the front rear-axle tandem carriers having either the long or short type inter-axle power divider differentials with or without the air-shifted lockout device. However, all carriers of the 92/93 series are identical, except for the optional input through-drive arrangement of the lead carrier. Skip all information that does not apply to the particular unit being serviced, such as a CRD-93 or CRD-113 which have neither a lockout nor an inter-axle power divider. Both the 92/93 and 112/113 series of carriers are identical, except for the slightly larger axle-spline diameter of the differential side gears in the CRD-112/113 carrier series.

OVERHAUL RECOMMENDATIONS

Unless your shop is equipped with holding stands, a heavy-duty hydraulic press, various gear and bearing pullers, and the means to make your own holding devices where required, it is highly recommended that the carriers be taken to the nearest MACK dealer for overhauling. The following recommendations are for shops that can handle this type of overhaul.

- Do not disturb parts with heavy press fits unless replacement is necessary.

- Use proper press setups and/or pullers during disassembly to avoid damaging usable parts during removal.
- Tighten all yoke or flange nuts as recommended. Refer to Bearing Adjustment and Torque Chart starting on page 122. If a heavy-duty air impact wrench with one-inch drive is available, high torques should be no problem. However, conventional methods of tightening or relieving these heavy torques require a way to hold the pinions to prevent them from rotating. Unless proper precautions are taken, this can be a very dangerous operation.
- Make a special tool if the gear-jamming method is to be used. The tool is a short rod (slug), about two inches long, and made of a 1/2-inch-diameter mild steel. Attach a handle at one end of the slug tool by welding a rod that is two feet long and 1/4 or 3/8 inch in diameter. One person can safely hold this gear-jamming tool in the gear mesh while someone else pulls the wrench. Because of the long handle, this tool cannot be left accidentally in the bevel gear compartment where it could cause damage.

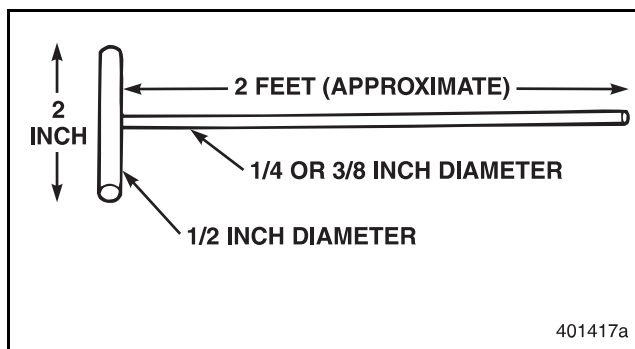


Figure 14 — Gear Jamming Tool

- At reassembly, make sure the bench, tools and working areas are clean.



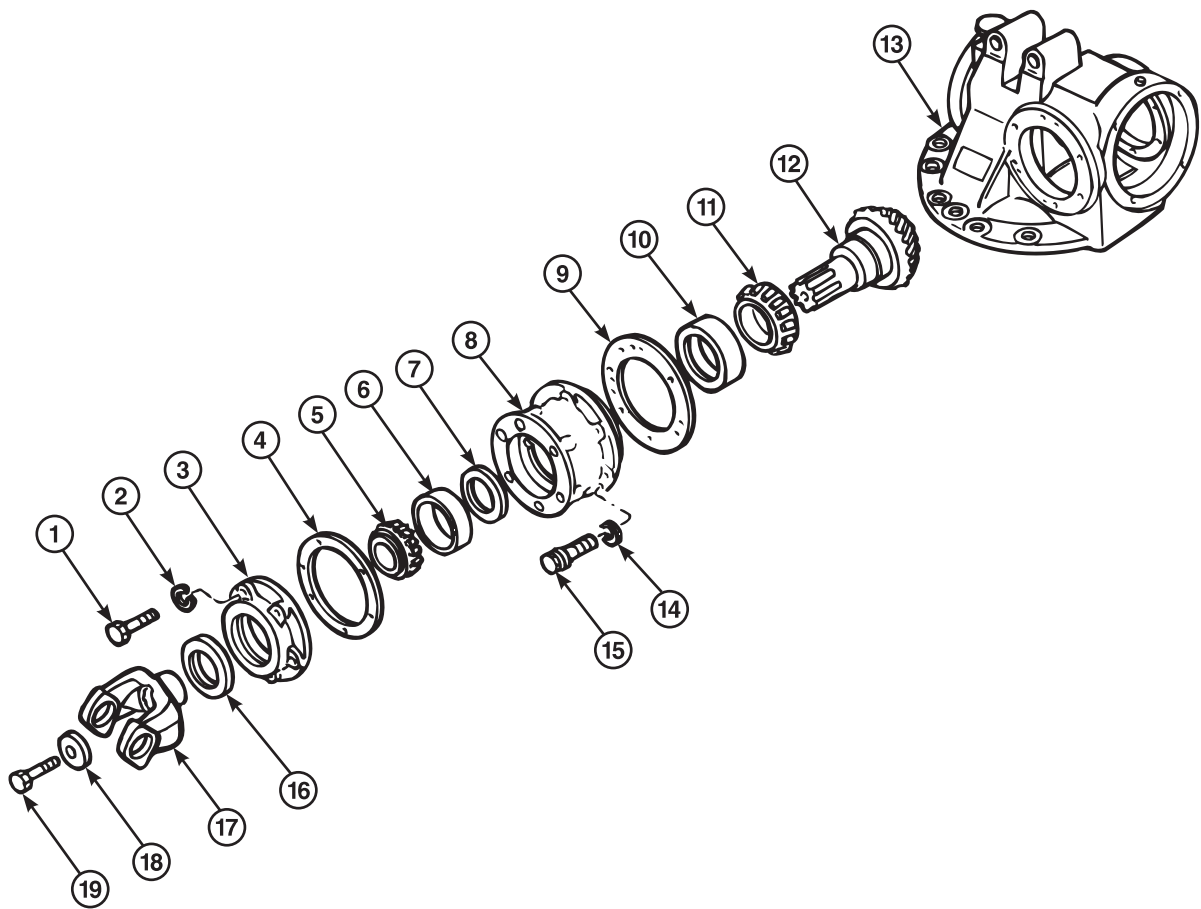
400 EXPLODED VIEWS

EXPLODED VIEWS



400 EXPLODED VIEWS

CRD 93/113 BEVEL PINION SHAFT ASSEMBLY



- 1. CAPSCREW
- 2. LOCK WASHER
- 3. COVER
- 4. GASKET
- 5. FRONT BEARING CONE
- 6. FRONT BEARING CUP
- 7. SPACER

- 8. PINION HOUSING
- 9. SHIM
- 10. REAR BEARING CUP
- 11. REAR BEARING CONE
- 12. BEVEL PINION SHAFT
- 13. CARRIER HOUSING
- 14. LOCK WASHER

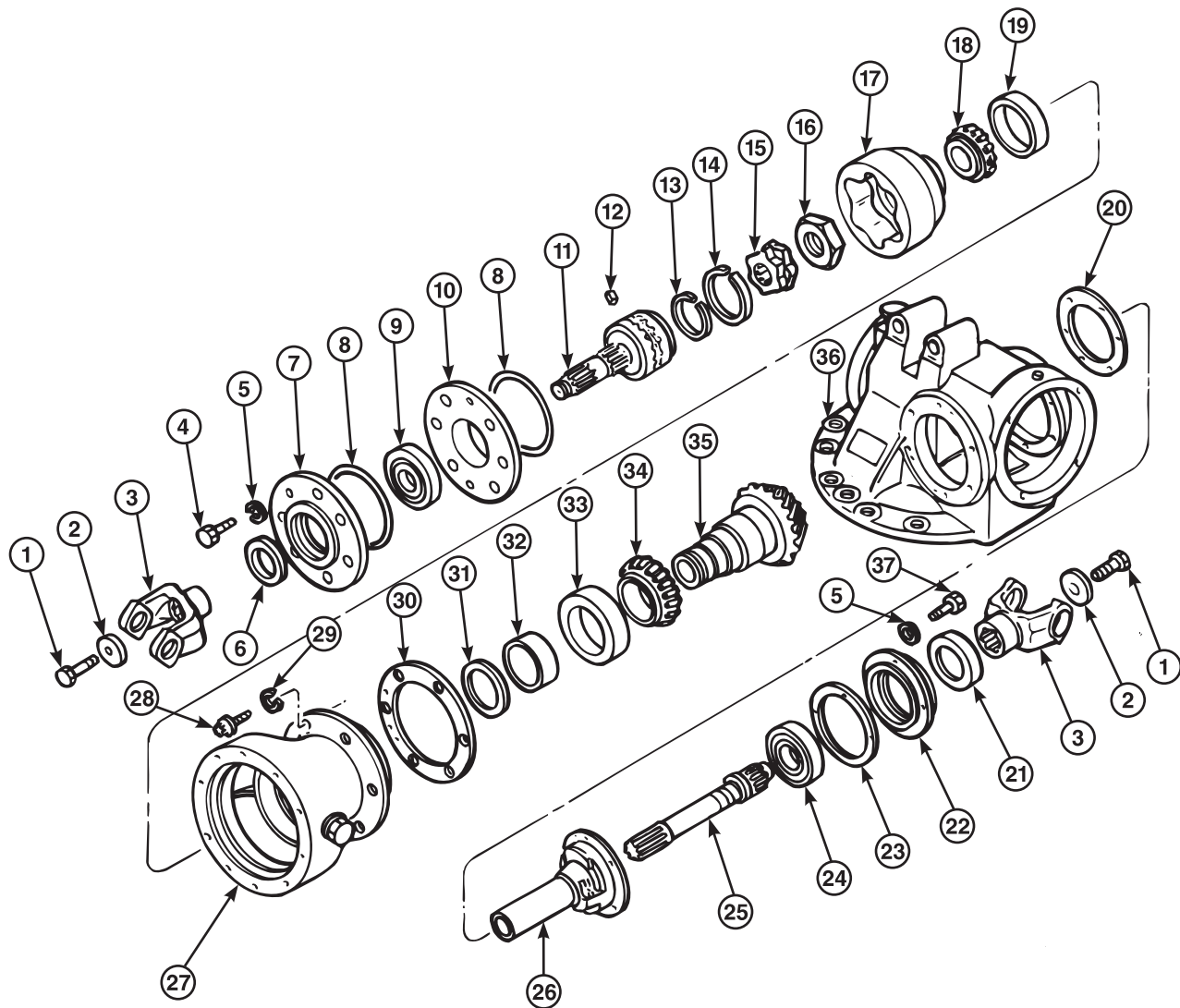
- 15. CAPSCREW
- 16. SEAL
- 17. YOKE
- 18. CLAMP PLATE
- 19. CAPSCREW

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400 EXPLODED VIEWS

CRD 92/112 BEVEL PINION AND INTER-AXLE POWER DIVIDER ASSEMBLY (WITHOUT AIR ACTUATED CONTROL)



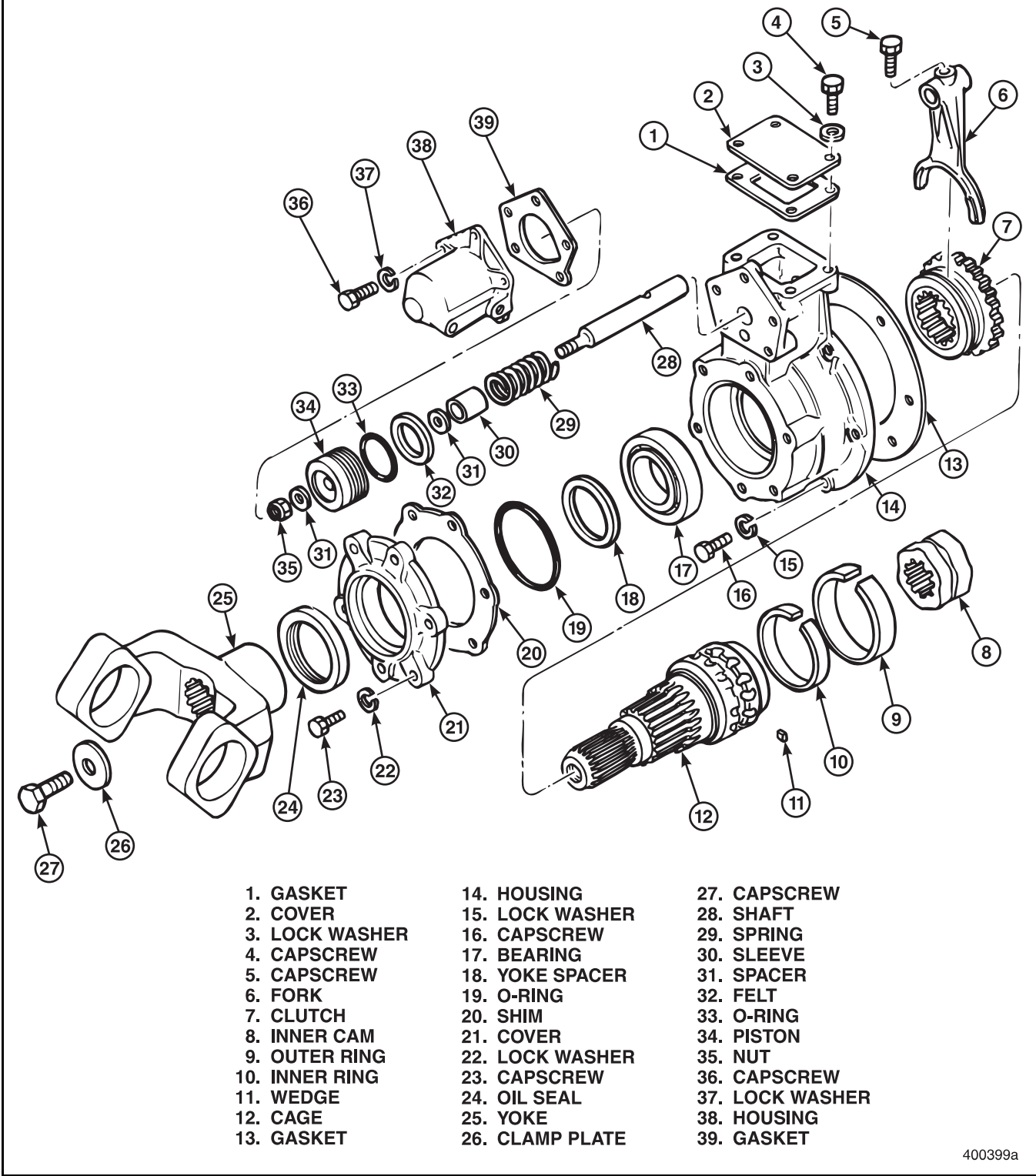
- | | | |
|----------------|---------------------------|---------------------|
| 1. CAPSCREW | 14. OUTER RING | 27. HOUSING |
| 2. CLAMP PLATE | 15. INNER CAM | 28. CAPSCREW |
| 3. YOKE | 16. NUT | 29. LOCK WASHER |
| 4. CAPSCREW | 17. OUTER CAM | 30. SHIM |
| 5. LOCK WASHER | 18. CONE | 31. SPACER |
| 6. OIL SEAL | 19. CUP | 32. SPACER |
| 7. COVER | 20. GASKET | 33. CUP |
| 8. O-RING | 21. SEAL | 34. CONE |
| 9. BEARING | 22. COVER | 35. BEVEL PINION |
| 10. RETAINER | 23. GASKET | 36. CARRIER HOUSING |
| 11. CAGE | 24. BEARING | 37. CAPSCREW |
| 12. WEDGE | 25. THROUGH SHAFT | |
| 13. INNER RING | 26. THROUGH SHAFT HOUSING | |

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400 EXPLODED VIEWS

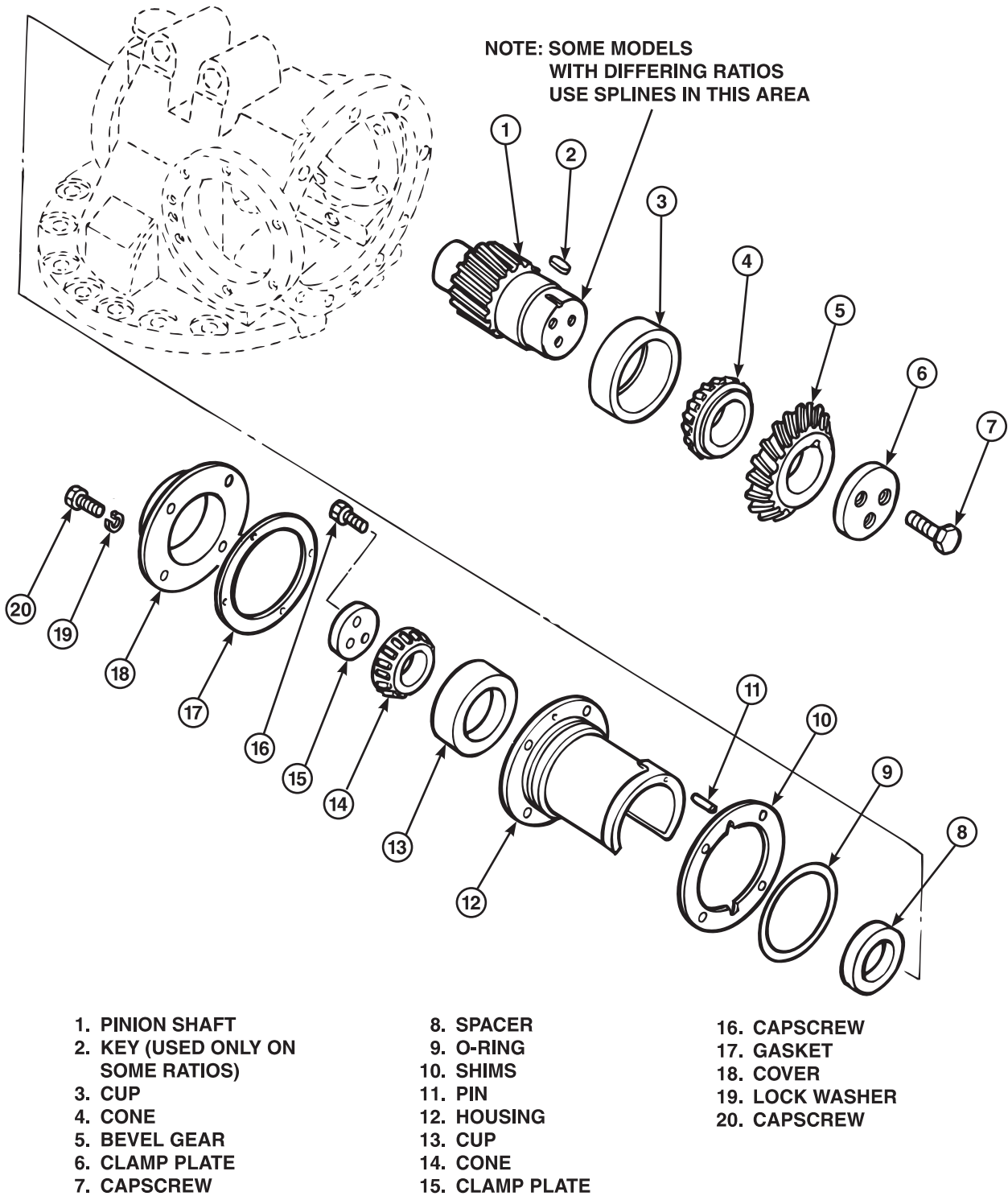
CRD 92/112 AIR-ACTUATED POWER
DIVIDER LOCKOUT





400 EXPLODED VIEWS

CRD 92/93 — 112/113 HELICAL (SPUR) PINION SHAFT

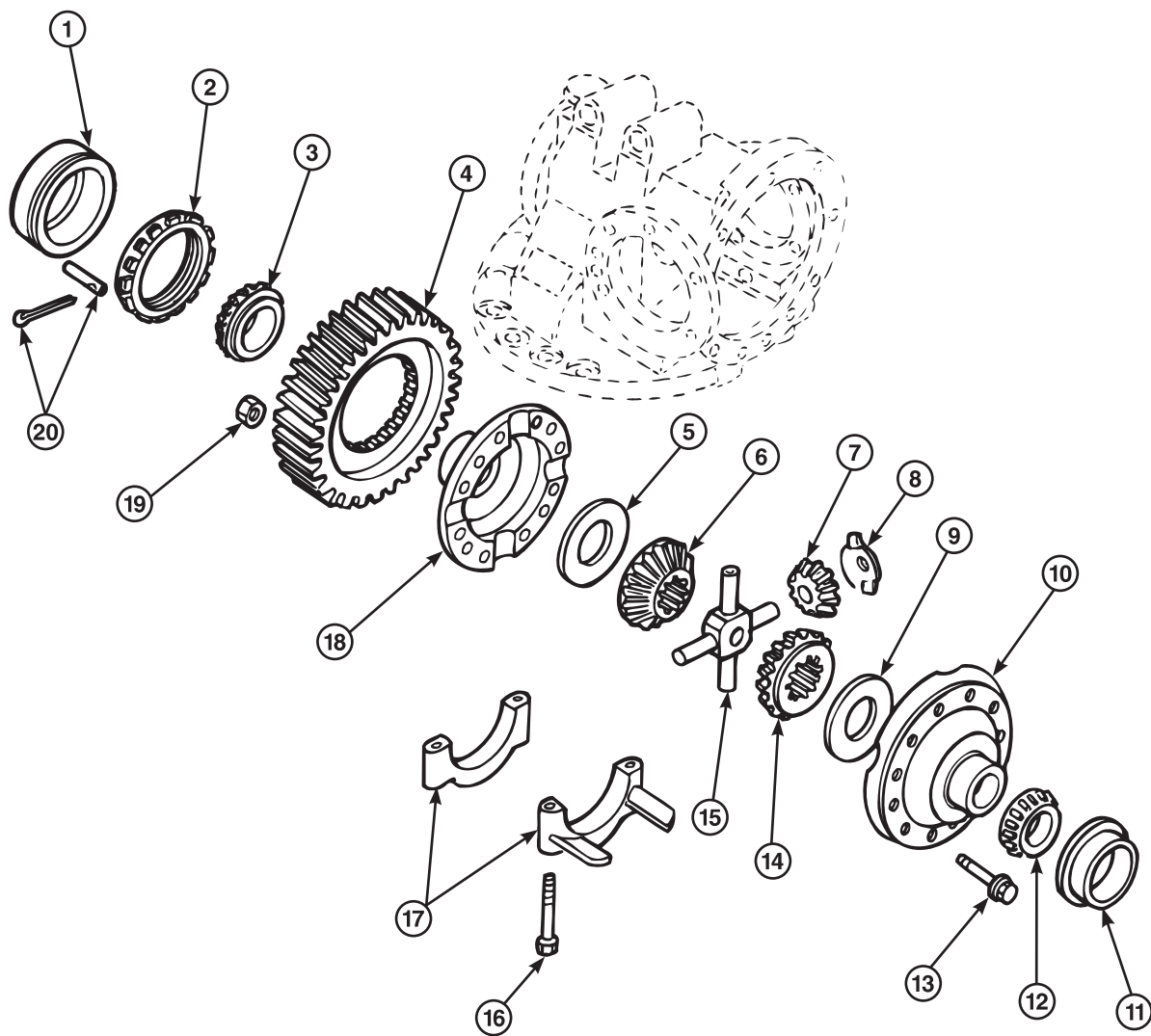


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400 EXPLODED VIEWS

CRD 92/93 — 112/113 FOUR PINION TYPE DIFFERENTIAL ASSEMBLY



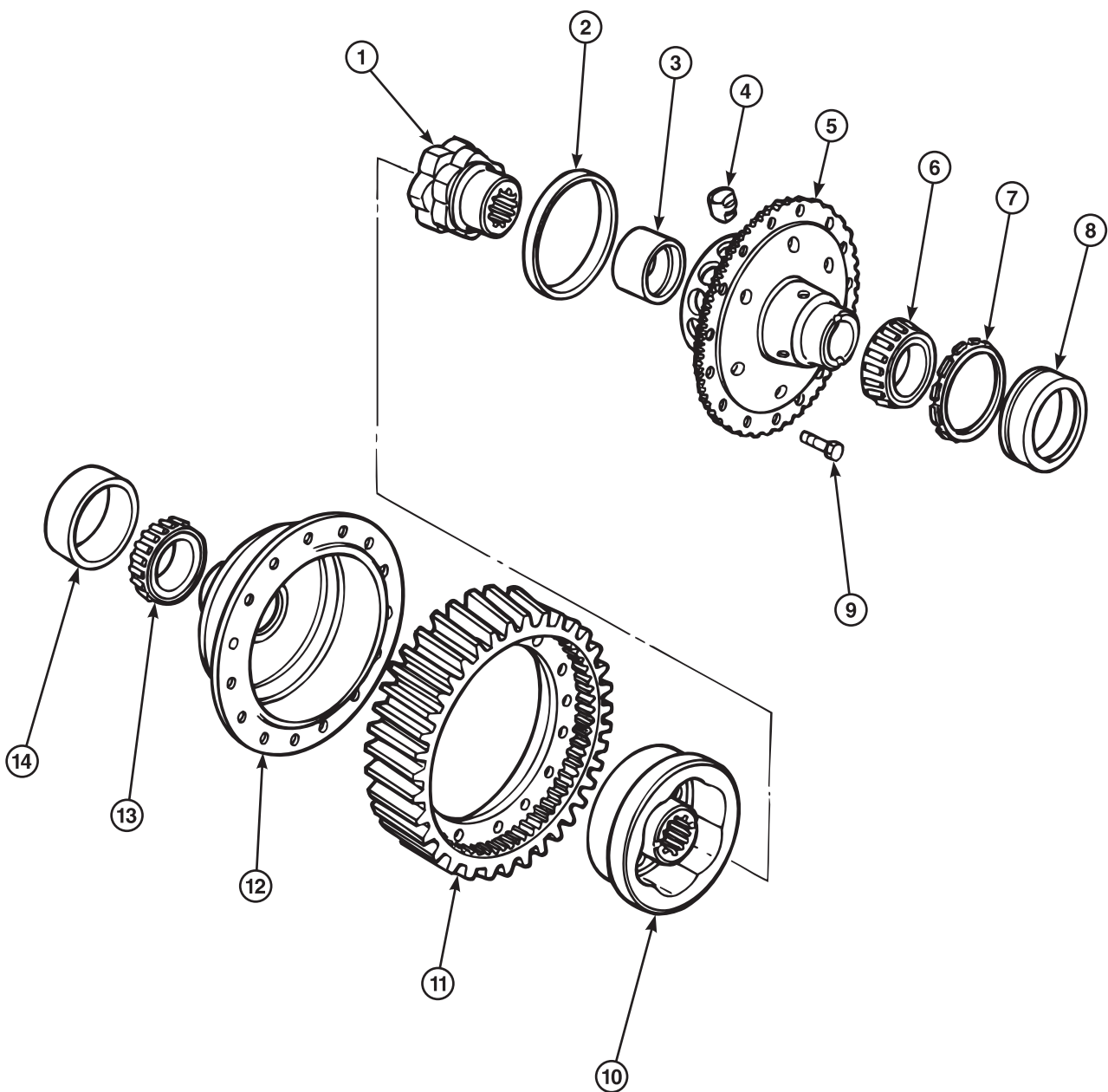
- | | | |
|----------------------------|----------------------------|--|
| 1. BEARING CUP | 8. PINION THRUST WASHER | 15. SPIDER |
| 2. ADJUSTING NUT | 9. SIDE GEAR THRUST WASHER | 16. BEARING CAP CAPSCREW |
| 3. BEARING CONE | 10. DIFFERENTIAL HALF | 17. BEARING CAPS |
| 4. BULL GEAR | 11. BEARING CUP | 18. DIFFERENTIAL HALF |
| 5. SIDE GEAR THRUST WASHER | 12. BEARING CONE | 19. NUT |
| 6. SIDE GEAR | 13. CAPSCREW | 20. COTTER PIN AND ADJUSTING
NUT LOCK PIN |
| 7. PINION (SPIDER GEAR) | 14. SIDE GEAR | |

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400 EXPLODED VIEWS

CRD 92/93—112/113 INTER-WHEEL POWER DIVIDER ASSEMBLY



1. INNER CAM
2. RETAINING RING
3. BUSHING
4. WEDGE
5. DRIVING CAGE

6. CONE
7. ADJUSTING NUT
8. CUP
9. CAPSCREW
10. OUTER CAM

11. BULL GEAR
12. SIDE CASING
13. CONE
14. CUP

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400 TROUBLESHOOTING

TROUBLESHOOTING



400 TROUBLESHOOTING

CARRIER TROUBLESHOOTING

The troubleshooting chart summarizes some common carrier complaints, probable causes and possible remedies.

Symptom	Probable Cause	Remedy
Noise	1. Low lubrication level. 2. Improper lubrication. 3. Contamination of lubricant. 4. Driveline phasing. 5. Driveline angle. 6. Worn, damaged or failed yoke. 7. Universal joint failure. 8. Loose pinion drive nut. 9. Worn or failed bearings. 10. Improper tooth contact, gearmesh. 11. Mixed gear ratios.	1. Fill to proper level using recommended lubricant. 2. Drain and refill with recommended lubricant to proper level. 3. Check servicing intervals. Check for water leaks. Drain and refill to proper level with recommended lubricant. 4. Correct phasing. 5. Correct angle. 6. Replace yoke. 7. Replace failed parts. 8. Tighten nut to torque. Stake if required. 9. Replace bearings. 10. Adjust by adding or removing shims to establish proper tooth contact. 11. Check ratios, both carriers must have same ratio.
Oil Leakage	1. Clogged breather. 2. Failed seals or gaskets. 3. Cracked housing.	1. Replace breather. 2. Replace failed seals or gaskets. 3. Replace housing.
Bearing Failure	1. Improper lubrication. 2. Worn, damaged or failed yoke. 3. Wrong preload on bearings. 4. Pump failure. 5. Misaligned gears.	1. Check specification for proper lubrication, replace failed bearing. 2. Repair using speedi-sleeve on shaft or replace failed parts. 3. Replace failed parts and adjust preload to specifications. 4. Repair or replace failed parts. 5. Replace failed parts, make certain gears are properly aligned and check tooth contact pattern.
Vibration	1. Driveline phasing. 2. Driveline angle. 3. Worn, damaged or failed yoke. 4. Universal joint failure. 5. Loose clamp plate capscrew. 6. Worn or failed bearings. 7. Mixed gear ratios.	1. Correct phasing. 2. Correct angle. 3. Replace yoke. 4. Replace universal joint. 5. Tighten capscrew to recommended torque. 6. Replace bearings. 7. Check ratios, both carriers must have same ratio.

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400 TROUBLESHOOTING

Symptom	Probable Cause	Remedy
Gear Failure	1. Low lubrication. 2. Improper lubrication. 3. Contamination of lubricant. 4. Driver abuse. 5. Worn or failed bearings. 6. Loose clamp plate capscrews. 7. Improper ratio for application. 8. Improper tooth contact, gearmesh.	1. Fill to proper level using recommended lubricant. 2. Check Maintenance and Lubrication Manual (TS494) for proper lubrication. 3. Check servicing intervals, check for water leaks. Replace failed parts and fill to proper level using recommended lubricant. 4. Instruct driver in proper procedure. 5. Replace failed parts. Make certain gears are properly aligned. Check tooth contact pattern. 6. Replace failed parts. Torque capscrews to proper torque. 7. Recalculate drive train ratios. Replace as required. 8. Replace failed parts. Make certain tooth contact pattern is correct.
Power Divider Failure	1. Driver abuse. 2. Tire size. 3. Loose clamp plate capscrews. 4. Loose drive pinion nut. 5. Collector trough missing. 6. Pump failure. 7. Worn peanuts and cams. 8. Mixed gear ratios. 9. Air leak or restricted line. 10. Seal failure. 11. Faulty control valve. 12. Failed spring. 13. Seized components. 14. Failed shifter fork.	1. Instruct driver in proper operating procedures. 2. Check for proper matching of tires. 3. Replace damaged parts. Tighten capscrews to proper torque. 4. Repair failed parts. Torque to proper specification. 5. Repair, make certain front rear axle carrier cover has collector trough. 6. Repair or replace as required. 7. Replace. 8. Check ratios; both carriers must have same ratio. 9. Repair or replace as required. 10. Replace failed seal. 11. Replace. 12. Replace. 13. Replace. 14. Replace.
Excessive Tire Scuffing or Wear	1. Mixed gear ratios.	1. Check ratios, both carriers must have same ratio.

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400 TROUBLESHOOTING

TROUBLESHOOTING AND DIAGNOSING MISMATCHED CARRIER RATIOS FOR TANDEM CARRIERS

Check the tandem carrier for mismatched carrier ratios if any of the following conditions occur:

- Tire scuffing or wear
- Noise in the power divider or shortened power divider life
- Noise in the transmission in various gears

Mismatched carrier ratios can transmit noise through the drive line and transmission.

Carrier Identification Stamping

If mismatched carrier ratios are suspected, check the carrier identification stampings for matched ratios.

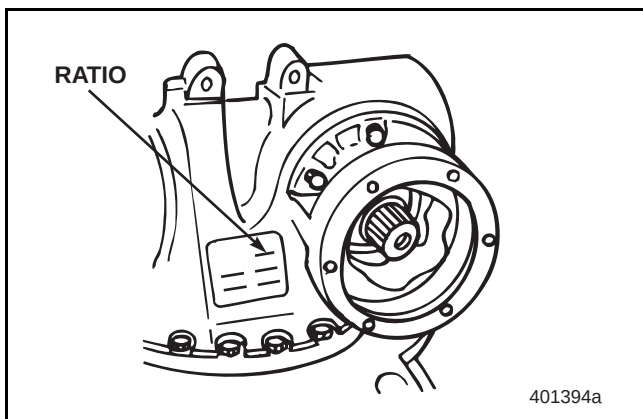


Figure 15 — Carrier Ratio Stamping Location

If the stampings are compatible and mismatched ratios are still suspected, mark the tandem axle tires with a piece of chalk so that one complete wheel rotation can be monitored when the chassis is moved across the floor. Also, mark the propeller shaft and intermediate shaft yoke in reference to the pinion, carrier or power divider housing.

CAUTION

Make sure the eight tandem rear tires are properly matched. Refer to MACK Service Manual 15-101 Wheels, Rims and Tires.

1. With an operator in the cab and the transmission in neutral, release the spring brakes. Make sure there is sufficient room to push the chassis forward one complete wheel rotation.
2. Push the chassis forward and count the number of shaft rotations during one complete wheel rotation. For example, with a 5.02 carrier ratio, the driveshaft will rotate 5 times to one tire rotation.

If a variation exists between tire revolution and/or drive-line rotation between front rear and rear rear carriers, a physical inspection of each gear set must be made.

Gear Set Inspection

Drain the upper gear case. Remove the bevel gear compartment side access cover. Count the teeth of the bevel gear set (1) in each carrier. Refer to Figure 16.

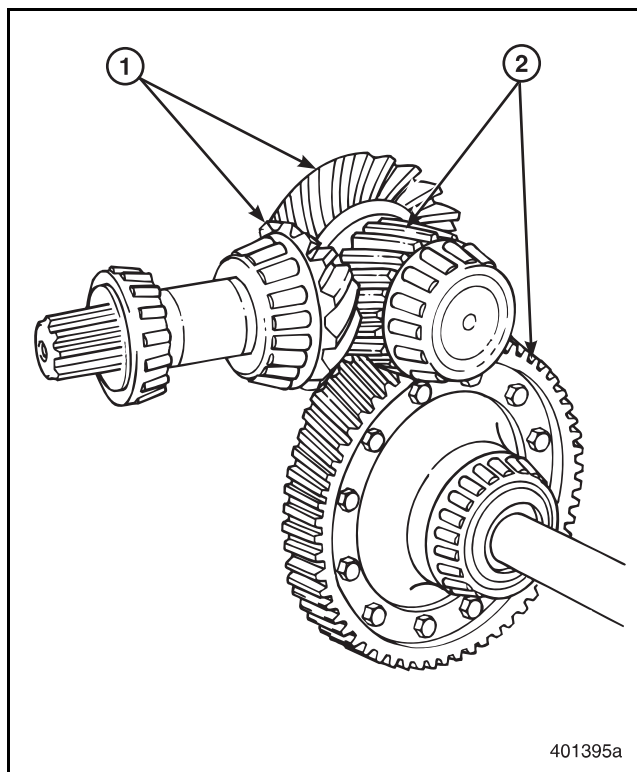


Figure 16 — Dual Reduction Carrier Gear Train



400 TROUBLESHOOTING

If the bevel gear sets are compatible, drain the tandem axle housing and remove the carrier assemblies. Count the teeth of each helical pinion shaft and bull gear (2). Refer to Figure 16.

Example: Bevel gear — 19 teeth
Bevel pinion — 13 teeth
19/13 = 1.46

Helical bull gear — 55 teeth
Helical pinion gear — 16 teeth
55/16 = 3.44

1.46 x 3.44 = 5.02 Ratio

Correct all mismatched gear sets.



NOTES

