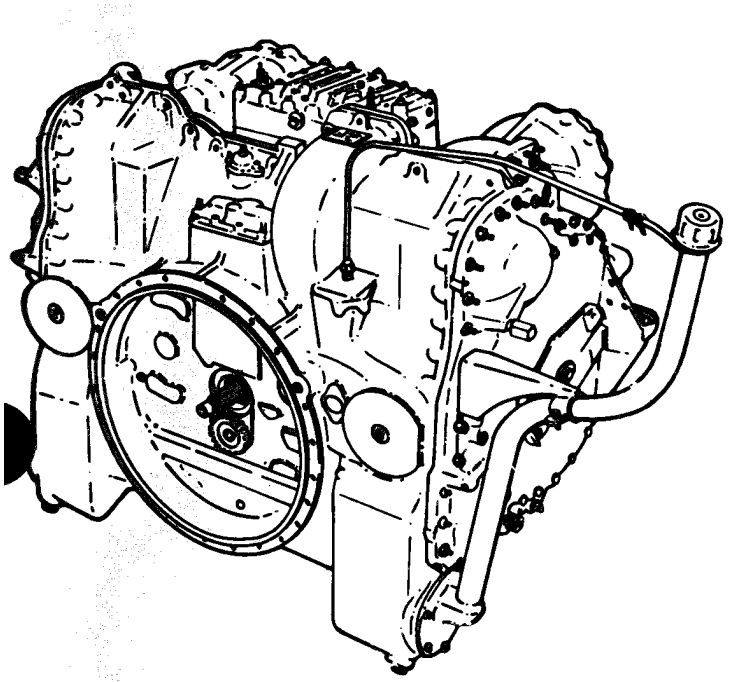
TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS)



CROSS DRIVE TRANSMISSION W/CONTAINER

MODEL CD 850-6A
DETROIT DIESEL ALLISON DIVISION, GMC

NSN 2520-00-086-7792

CURRENT AS OF

HEADQUARTERS, DEPARTMENT OF THE ARMY

TA251569

SEPTEMBER 1983

WARNING

AIR UNDER PRESSURE

is used in the maintenance of the transmission.

Operating personnel and those in the immediate area should observe safety precautions.

SERIOUS INJURY

may result when compressed air comes in contact with the skin or causes flying metal chips.

WARNING

EXPLOSIVE VAPORS

are given off by most cleaning solvents.

They also burn easily. Always use in a well ventilated area.

DEATH OR SERIOUS INJURY

can occur if explosive vapors are ignited.

WARNING

PAINT AND VARNISH REMOVERS AN I.) ALKALINE SOLUTIONS used in the maintenance of the transmission must not be inhaled or come into contact with eyes or skin. Use extreme care when using removers or alkaline solutions. Follow all recommended safety precautions.

BLINDNESS OR SERIOUS INJURY

may result if these substances are inhaled or come into contact with eyes or skin.

CHANGE

No. 2

HEADQUARTERS
DEPARTMENTOF THE ARMY
WASHINGTON, D. C., *13 December 1985*

DS and GS Maintenance Manual

CROSS-DRIVE TRANSMISSION - MODEL CD 850-6A
PART NUMBER 5703101
NSN 2520-00-086-7792

CROSS-DRIVE TRANSMISSION - MODEL CD 850-6A-1
PART NUMBER 5703172
NSN 2520-01-159-6214
Current as of 4 January 1984

TM 9-2520-223-34 & P is changed as follows:

1. This Change 2 corrects page sequence printing errors found in Change 1.

2. Remove and insert pages as indicated below.

Remove pages	Insert pages
i thru iv	i thru iv
1-1 thru 1-4	1-1 thru 1-5/1-6
1-5 and 1-8	1-5 thru 1-8
1-23 thru 1-26	1-23 thru 1-24.1 /1-24.2 1-25 and 1-26
2-7 thru 2-12	2-7 thru 2-12
2-23 thru 2-76	2-23 thru 2-83/2-84
3-3 and 3-4	3-3 and 3-4
3-21 thru 3-24	3-21 thru 3-24
3-31 and 3-32	3-31 and 3-32
B-1 thru B-85/B-86	B-1 thru B-85/B-86

3. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a vertical bar in the margin.

4. Retain these sheets in front of manual for reference purposes.

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

MILDRED E. HEDBERG
Brigadier General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-37, Direct and General Support Maintenance requirements for Tank, Bridge Launcher, M60A1 (AVLB); Tank, Combat, Full Tracked, 105-MM, M48A5; Tank, Combat, Full Tracked, 105-MM, M60; Tank, Combat,Full Tracked, 105-MM, M60A1; Hull, and M60A1 AOS; Tank, Bridge Launcher M48A5 (AVLB); Tank Combat, Full Tracked, 105-MM, M60A1, RISE and M60A1 RISE PASSIVE; Tank, Combat, Full Tracked, 105-MM, M60A3 and TTS.

TM 9-2520-223-34 & P
C1

HEADQUARTERS
DEPARTMENTOF THE ARMY
Washington, DC, *24 January 1984*

DS and GS Maintenance Manual

CROSS-DRIVE TRANSMISSION - MODEL CD 850-6A
PART NUMBER 5703101
NSN 2520-00-086-7792

CROSS-DRIVE TRANSMISSION - MODEL CD 850-6A-1
PART NUMBER 5703172
NSN 2520-01-159-6214

TM 9-2520-223-34 & P is changed as follows:

1. Title is charged as shown above.

2. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Table of Contents	i thru iv	i thru iv
Chapter 1	1-1 and 1-2	1-1 and 1-2
	1-5 thru 1-8	1-5 thru 1-6.1
		1-7 and 1-8
	1-23 thru 1-26	1-23 thru 1-24.1 /1-24.2
		1-25 and 1-26
Chapter 2	2-23 thru 2-76	2-23 thru 2-83/2-84
Chapter 3	3-3 and 3-4	3-3 and 3-4
	3-21 thru 3-24	3-21 thru 3-24
	3-31 and 3-32	3-31 and 3-32
Appendix B	B-1 thru B-85/B-86	B-1 thru B-85/B-86
Index	I-1 thru I-4	I-1 thru I-5/I-6

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ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-37, Direct and General Support Maintenance requirements for Tank, Combat, Full Tracked 105mm, M60, M60A1; Combat Engineer, Full Track, M728; Tank, Bridge Launcher, AVLB; Tank, Combat, Full Tracked: 105mm Gun, M60A1 (Rise) Tank, Combat, Full Tracked: 105mm Gun, M48A5; M60A3, Tank Turret.

WARNING

DENATURED ALCOHOL IS POISONOUS

if taken internally.

BLINDNESS OR DEATH

can occur from drinking denatured alcohol.

Get medical attention immediately if taken internally.

WARNING

AIR UNDER PRESSURE

in the shipping container must be relieved before

the container is opened.

SERIOUS INJURY

may result if pressure is not safely relieved

by opening the air valve before the container is opened.

WARNING

TRANSMISSION ON SLING

may rotate when raised. Stand clear when transmission is lifted.

SERIOUS INJURY

can occur to persons standing in the way of the transmission

if it swings around when raised.

WARNING

ROTATING THRUST WASHER BEARINGS
(TRANSMISSION OUTPUT FLANGES)

can strike and injure persons standing too close.

Warn personnel to stand clear before starting the engine.

Keep all personnel safely away when the engine is running.

PERSONAL INJURY OR DAMAGE TO EQUIPMENT

can occur if personnel get in the way of the rotating flanges.

TECHNICAL MANUAL
*TM 9-2520-223-34 & P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 20 September 1983

DIRECT SUPPORT AND GENERAL SUPPORT

MAINTENANCE MANUAL
(Including Repair Parts and Special Tools Lists)

TRANSMISSION W/CONTAINER
Model CD 850-6A
NSN 2520-00-086-7792
Model CD 850-6A-1
NSN 2520-01-159-6214
Current as of 7 July 1983

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to:

Commander
U.S. Army Tank-Automotive Command
Warren, MI 48397-5000
ATTN: AMSTA-MBC

A reply will be furnished to you.

TABLE OF CONTENTS

*This manual supersedes TM 9-2520-223-34, 7 December 1971, including all changes.

TABLE OF CONTENTS (Cont'd)

HOW TO USE THIS MANUAL

You must familiarize yourself with the entire contents of a maintenance task before starting the step-by-step maintenance procedures.

This manual provides the procedures to be followed to perform Direct Support and General Support maintenance of the Detroit Diesel Allison Model CD 850-6A Cross-Drive Transmission W/Container. It is presented in four chapters and three appendixes.

Chapter 1 provides general introductory information, including an operational description of the transmission and a cross-reference list from common names to official nomenclatures.

Chapter 2 provides transmission troubleshooting and transmission maintenance procedures.

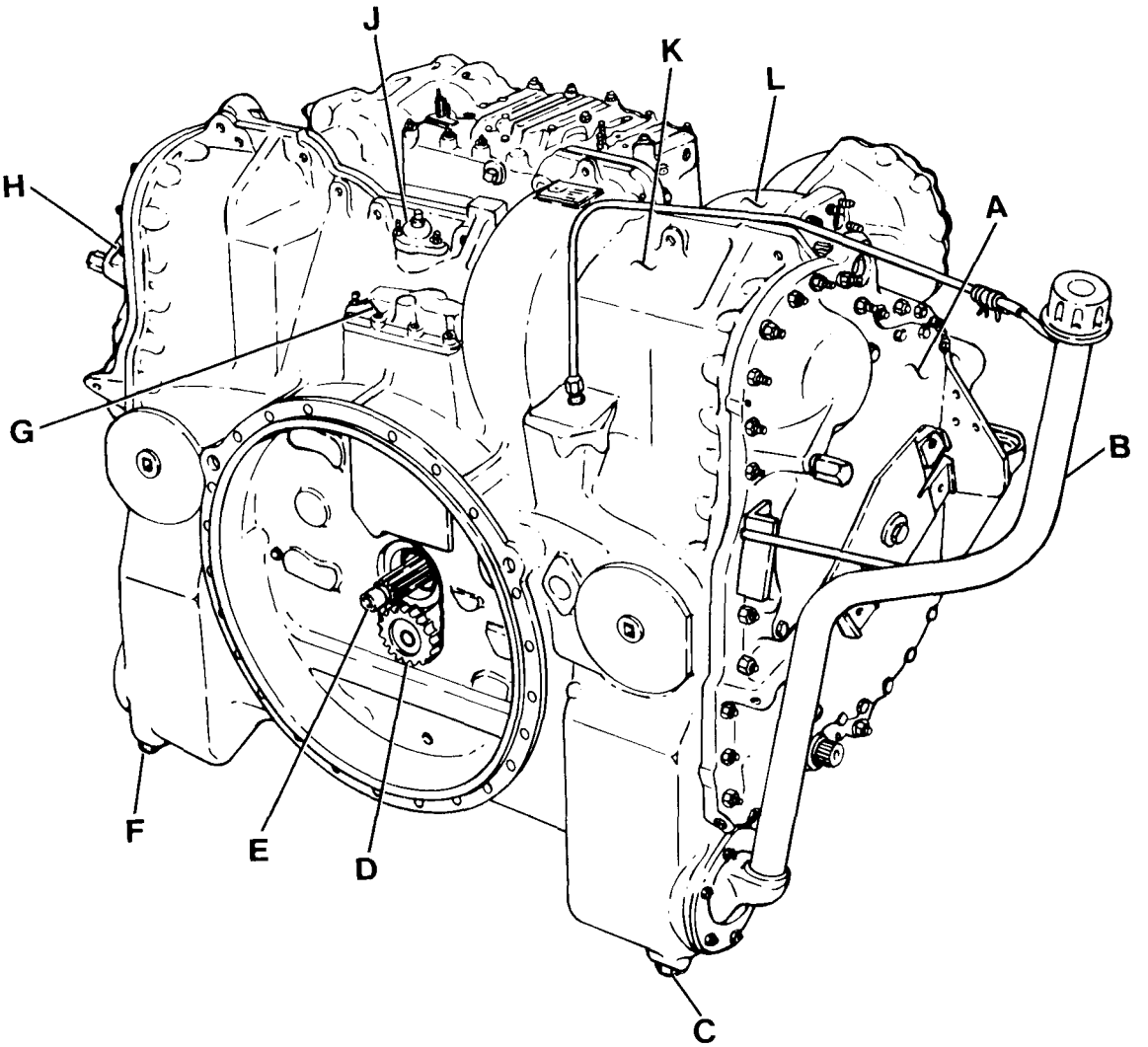
Chapter 3 provides component maintenance procedures.

Chapter 4 provides test and preservation information.

The three appendixes are:

Appendix A - References
Appendix B - Repair Parts and Special Tools Lists
Appendix C - Expendable Supplies and Materials Lists

All references to other portions of this manual are by page number. All references to data in other Technical Manuals are by TM number only.



A. Left End Cover
B. Side Oil Filler Assembly
C. Pipe Plug (Drain Plug)
D. Spur Gear (Oil Input Pump External Drive Gear)
E. Straight Shaft (Input Shaft)
F. Pipe Plug (Drain Plug)
G. Main Oil Filter Assembly
H. Right End Cover
J. Transmission Cap (Vent Cap)
K. Front Mechanical Housing
L. Rear Mechanical Housing

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CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

1-1 SCOPE

This technical manual covers the Detroit Diesel Allison Division Model CD 850-6A, 6A-1 Cross-Drive Transmissions w/Container. It contains instructions for both Direct Support and General Support maintenance of these transmissions.

b. Purpose of Equipment. The CD 850-6A, -6A-1 transmissions serve as the power train between the engine and drive sprockets in Army full-tracked vehicles.

c. End-Item Applications. Following are the end-item vehicles using the CD 850-6A, -6A-1 cross-drive transmissions.

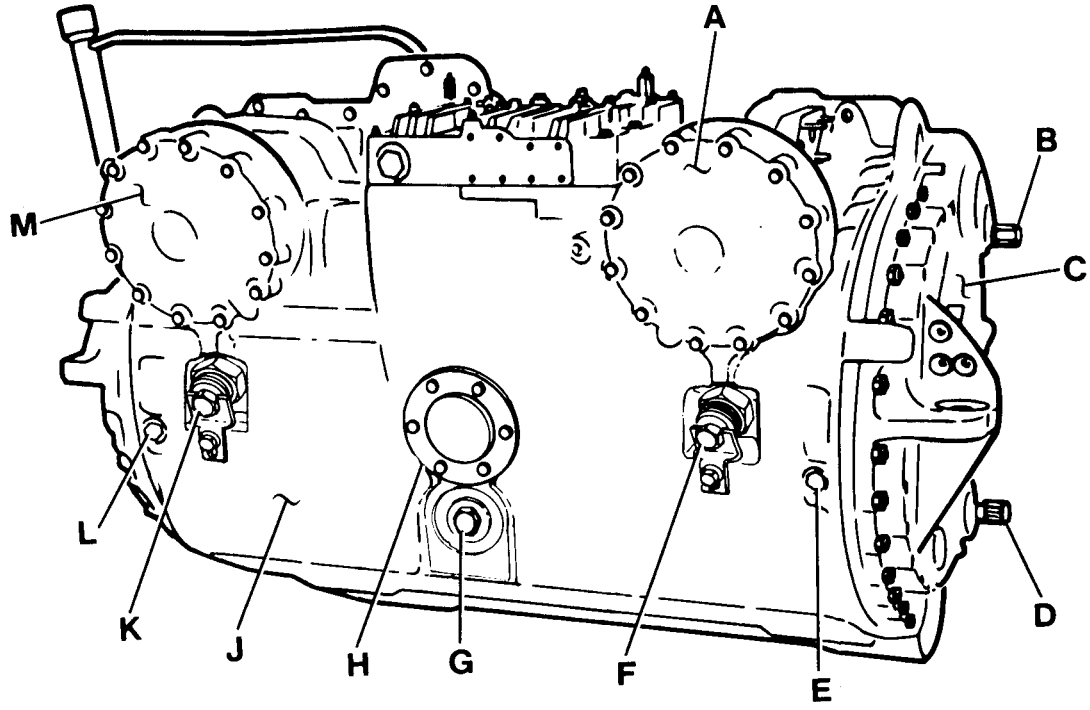
Vehicle			TM No. Series
Tank, Combat, Full-Tracked:	105 mm Gun,	M48A5	9-2350-258
Tank, Combat, Full-Tracked:	105 mm Gun,	M60	9-2350-260
Tank, Combat, Full-Tracked:	105 mm Gun,	M60A1	9-2350-215
Tank, Combat, Full-Tracked:	105 mm Gun,	M60A1 (RISE)	9-2350-257
Tank, Combat, Full-Tracked:	105 mm Gun,	M60A3	9-2350-253
Armored Vehicle Launched Bridge:		M48A2 AVLB	5-5420-200
Armored Vehicle Launched Bridge:		M60A1 AVLB	5-5420-202
Armored Vehicle Launched Bridge:		M48A5 AVLB	5-5420-226
Vehicle, Combat Engineering, Full-Tracked:		M728	9-2350-222

1-2 MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).

1-3 PREPARATION FOR STORAGE OR SHIPMENT

See Chapter 4, Test and Preservation, for maintenance instructions covering preparation for storage and shipment.



A. Access Cover (Low-Range Servo Piston Cover
B. Sleeve Nut (Brake Adjusting Worm Cap)
C. Right End Cover
D. Shouldered Shaft (Brake Apply Shaft)
E. Threaded Machine Plug (Brake Inspection Hole Plug)
F. Low-Range Band Adjusting Screw
G. Threaded Machine Plug (Input Shaft Plug)
H. Access Cover (Power Takeoff Cover)
J. Rear Mechanical Housing
K. Reverse-Range Band Adjusting Screw
L. Threaded Machine Plug (Brake Inspection Hole Plug
M. Access Cover (Reverse-Range Servo Piston Cover
N. Control Valve Assembly

TA 272325

1-4 NOMENCLATURE CROSS-REFERENCE LIST

The following list is a cross-reference between the common names used in the body of this manual, and the official nomenclatures contained in the RPSTL (Appendix B).

Common Name	Official Nomenclature
Anchor Seal	Seal Rubber Round
Annular Gasket	Ring Spacer
Band Adjusting Nut	Self-Locking Nut
Band Adjusting Screws	Screws
Bearing Lock Nut	Round Plain Nut
Bearing Retainer	Retaining Plate
Bearing Sleeve	Sleeve Bearing
Bevel Gear Bearing	Tapered Roller Bearing
Brake Adjusting Worm	Worm Shaft
Brake Adjusting Worm Cap	Sleeve Nut
Brake Apply Shaft	Shouldered Shaft
Brake Cam Ring Locator	Plate
Brake Inspection Hole Plug	Threaded Machine Plug
Brake Transmission Hole Plug	Threaded Machine Plug
Brake Rotating Plate	Transmission Plate
Brake Stationary Plate	Brake Disk
Bushing	Sleeve Bearing
Check Valve	Transmission Valve
Clutch Hub	Clutch Disk
Clutch Plate Drive Key	Machine Key
Clutch Release Spring	Compression Helical Spring
Compression Sleeve	Clinch Sleeve
Connector Bodies	Coupling Nuts
Connector Nut	Straight Adaptor
Control Valve Body Assembly	Transmission Body Assembly
Control Valve Body Cover	Access Cover
Converter Input Bearing	Tapered Roller Bearing
Converter Input Shaft	Torque Converter Shaft
Converter Output Shaft	Shaft
Converter Output Shaft Flange	Transmission Flange
Converter Turbine	Torque Turbine
Copper Gasket	Flat Washer
Differential Carrier	Differential Steering Hub
Dowel	Headless Straight Pin
Drain Plug	Pipe Plug
External-Tanged Clutch Plate	Clutch Disk
First Stator Assembly	Torque Converter Stator
Forward End	Bore
Front Housing	Mechanical Housing
Gasket	Ring Spacer
High-Range Clutch Cover Plate	Clutch Disk
High-Range Clutch Hub	Spur Gear
High-Range Clutch Inner Pressure Plate	Plate

NOMENCLATURE CROSS-REFERENCE LIST (Cont'd)

Common Name	Official Nomenclature
High-Range Clutch Piston	Transmission Clutch Piston
High-Range Clutch Plate	Clutch Disk
Hook Type Seal Ring	Metal Seal Ring
Hub Assembly	Hub
Inner Unit	Inner Unit Assembly
Input Driven Bevel Gear	Helical Gear
Input Oil Pump	Oil Input Pump
Input Oil Pump Drive Gear	Spur Gear
Input Oil Pump External Drive Gear	Spur Gear
Input Pump Tube Assembly	Metal Tube Assembly
Input Shaft	Straight Shaft
Input Shaft Plug	Threaded Machine Plug
Input Transfer Drive Gear	Spur Gear
Input Transfer Driven Gear	Spur Gear
Internal-Splined Clutch Plate	Clutch Disk
Left Steer Shaft Drive Gear	Spur Gear
Long Steer Shaft	Shouldered Shaft
Low-Range Band Assembly	Brake Band Assembly
Low-Range Carrier Assembly	Carrier Assembly
Low-Range Clutch Drum	Clutch Disk
Low-Range Drum	Drum
Low-Range Servo Piston Cover	Access Cover
Low-Range Sun Gear	Spur Gear
Low-Range Ring Gear Assembly	Internal Gear
Lube Pressure Regulator Valve	Lubricating Valve
Main Cross Drive Shaft Assembly	Main Shaft Assembly
Main-Pressure Valve Assembly	Regulator Valve
Needle Bearing Assembly	Needle Roller Bearing
O-Ring Retainer	Sleeve Spacer
Oil Filter Valve	Main Oil Valve
Oil Pump Drive Gear	Spur Gear
Oil Pump Gear	Spur Gearshaft
Oil Seal	Plain Encased Seal
Oil Transfer Spacer	Transmission Spacer
Oil Transfer Tube	Metal Bent Tube
Output Flange	Thrust Washer Bearing
Output Member	Driven Member
Output Oil Pump Assembly	Transmission Pump Assembly
Output Oil Pump Drive Gear	Spur Gear
Output Planetary Sun Gear	Spur Gear
Output Ring Gear	Internal Gear
Output Steer Gear	Spur Gear
Output Sun Gear	Spur Gear
Pinions	Spur Gears
Planet Pinion Roller	Bearing Roller
Planet Pinion Washer	Thrust Washer Bearing
Power Takeoff Cover	Access Cover
Pressure Plate	Plate
Rearward End	Bore
Release Springs	Helical Springs

NOMENCLATURE CROSS-REFERENCE LIST (Cont'd)

Reverse Gear Band Assembly	Brake Band Assembly
Reverse-Range Band Assembly	Brake Band Assembly
Reverse-Range Servo Piston Cover	Access Cover
Reverse-Range Sun Gear	Spur Gear
Right Output Internal Gear	Internal Gear
Right Output Ring Gear	Internal Gear
Right Steer Shaft	Shouldered Shaft
Right Steer Shaft Drive Gear	Spur Gear
Roller Bearing Assembly	Cylindrical Roller Bearing
Roller Bearing Sleeve	Sleeve Bearing
Rotating Plate	Transmission Plate
Rubber Plug	Rubber Bumper
Rubber Seal	Oil Seal
Screen	Suction Sediment Strainer Element
Seal Ring	Compression Cup
Seal Ring	Preformed Packing
Second Stator Assembly	Transmission Stator
Servo Piston Cover	Access Cover
Shaft Flange Washer	Flat Washer
Shift Control Valve	Transmission Valve
Shims	Flat Washers
Short Steer Shaft	Shouldered Shaft
Side Oil Screen Cover	Access Cover
Single Row-Ball Bearing	Annular Ball Bearing
Spacer	Flat Washer
Spanner Nut	Nut
Spring	Compression Helical Spring
Steer Clutch Plate	Clutch Disk
Steer Clutch Plate Hub	Hub Disk Clutch
Steer Drive Shaft	Shouldered Shaft
Steer Indicator	Dial Pointer
Steer Output Gear	Spur Gear
Steer Output Pinion Gear	Spur Gear
Steer Pinion	Spur Gear
Steer Plug	Threaded Machine Plug
Steer-Shaft Drive Gear	Spur Gear
Steering Valve Sleeve	Directional Sleeve
Stop	Headless Straight Pin
Suction Tube Assembly	Strainer Assembly
Thrust Washer	Thrust Washer Bearing
Torque Converter Output Shaft	Shaft
Torque Converter Turbine Hub	Turbine Cover Hub
Transfer Drive Gear	Helical Gear
Transfer Driven Gear	Helical Gear
Transmission Assembly	Cross-Drive Transmission
Transmission Drive Gear	Helical Gear
Transmission Output Flanges	Thrust Washer Bearings
Valve Body Assembly	Repair Standards
Vent Cap	Transmission Cap

1-5 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your transmission needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at this address:

Commander
U.S. Army Tank-Automotive Command
Warren, MI 48090
ATTN: DRSTA-MB

A reply will be furnished to you.

1-5.1 DIFFERENCES BETWEEN MODELS

	Model Number	
Part Name	CD 850-6A	CD 850-6A-1
Input Oil Pump with integral sump tube and bypass valve	No	Yes
Output Oil Pump with integral sump tube	No	Yes
Oil Pressure Regulator Tube	No	Yes

1-6 DESCRIPTION

a. General. The Model CD 850-6A, -6A-1 transmissions are hydraulic, cross-drive type, They accept input power from an engine through a single straight shaft (input shaft). They transmit output power to left and right output shafts for-connection to sprocket drive shafts of a full-tracked vehicle.

b. Orientation. The side of the transmission that mounts on the vehicle engine is designated as FRONT and the opposite side as REAR. Left and right ends are on the viewer's left and right when viewing the transmission from the rear.

c. Associated Components.

(1) Operator Controls. Operator controls are connected to the transmission through mechanical linkage. See technical manual series of the applicable end-item vehicle for details.

(2) Oil Cooler. An external oil cooler, connected to the transmission through appropriate oil lines, is required. See technical manual series of the applicable end-item vehicle for details.

(3) Oil Pressure and Temperature Indicators. Remote indicators, connected to transmitters on the transmission, are required. See technical manual series of the applicable end-item vehicle for details.

d. Operator and Organizational Maintenance. See technical manual series of the applicable end-item vehicle.

1-7 CHARACTERISTICS, CAPABILITIES, AND FEATURES

a. Characteristics. The transmission gives the operator control of the engine as it powers the drive sprocket shafts in a full-tracked vehicle.

b. Capabilities. The transmission fuctions are:

(1) Neutral
(2) Low-range forward speeds
(3) High-range forward speeds
(4) Reverse
(5) Left or right steering
(6) Braking

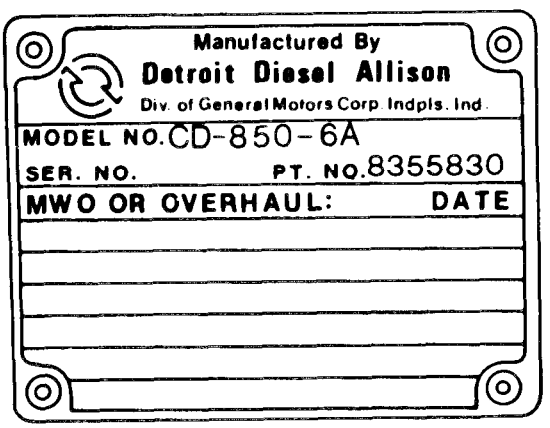
c. **Features.** Power takeoff if available. It is delivered through an internal spline in the end of the input driving bevel gear shaft. The spline on the input drive gear shaft can be used to align the straight shaft splines with the engine output splines. This can be done when assembling the power package. It can also be used to rotate the engine crankshaft for engine timing or for other maintenance actions.

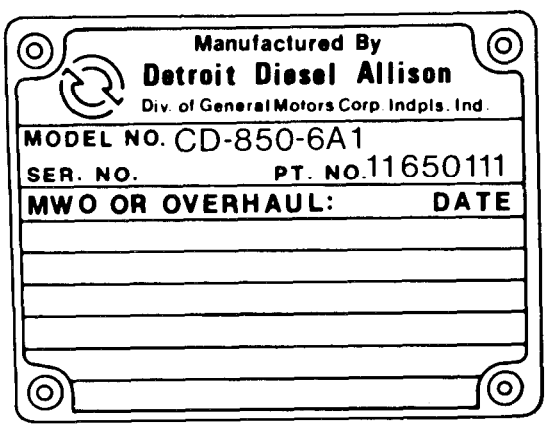
1-8 MAJOR COMPONENTS

a. External Components. External components of the transmission are shown on pages iv and I-2.

b. Internal Components. The internal components are shown in the cutaway view on page 1-8.

c. Identification Plate. A plate is attached to the top center of the front housing and is shown below.





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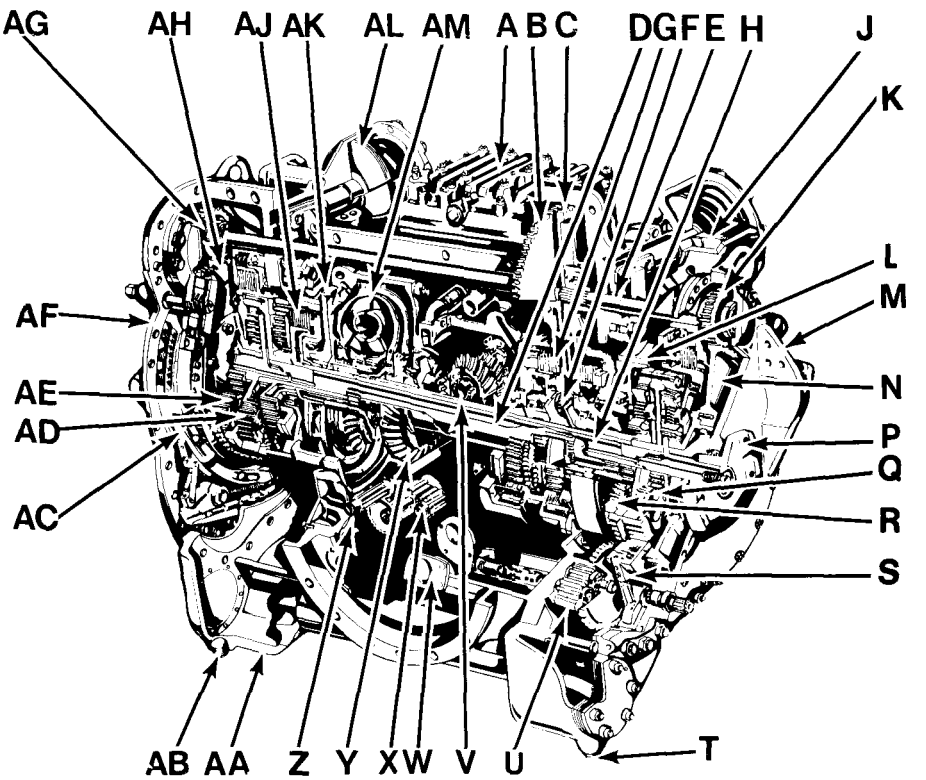


A. Control valve assembly
B. Spur gear (right steer shaft drive gear)
C. Spur gear (left steer shaft drive gear)
D. Converter output shaft
E. Shouldered shaft (right steer shaft)
F. Steer differential assembly
G. Left steer clutch
H. Main shaft assembly
J. Reverse-range servo piston assembly)
K. Spur gear (steer output pinion gear)
L. Reverse-range band assembly
M. Left end cover
N. Spur gear (steer output pinion gear)
P. Thrust washer bearing (output flange)
Q. Left output planetary gearing
R. Reverse-range gearing
S. Left brake apply cam mechanism
T. Pipe plug (drain plug)
U. Transmission pump assembly (output oil pump assembly)
V. Converter input shaft
W. Metal tube assembly (input pump tube assembly
X. Oil input pump (input oil pump)
Y. Input bevel gearing
Z. Straight shaft (input shaft)
AA. Front mechanical housing
AB. Pipe plug (drain plug)
AC. Right brake apply cam oil
AD. Low-range planetary gearing
AE. Right output planetary gearing
AF. Right end cover
AG. Spur gear (steer output pinion gear
AH. Spur gear (steer output pinion gear
AJ. High-range clutch
AK. Low-range band assembly
AL. Low-range servo piston assembly
AM. Torque converter assembly

1-9 EQUIPMENT DATA

Manufacturer	Detroit Diesel Allison Division of General Motors Corporation
Type	Cross-drive with hydraulic torque converter and planetary gearing
Weight, dry	3030 lb (1376 kg)
Overall Dimensions	
Length, front to rear	29.29 in. (74.40 cm)
Height (excluding oil filler tube)	39.50 in. (100.33 cm)
Width (including mounting pads)	53.50 in. (135.89 cm)
Suspension	3 point (attached to engine and two transmission mounting pads)
Nameplate location	Top of front housing
Rating:	
Max input torque	1685 lb-ft (2285 N.m)
Max input speed	2400 rpm
Max input power	650 hp (485 kW)
Drive ranges	Low, high, and reverse
Overall gear ratios:	
Low-range	3.00 to 1
High-range	1.08 to 1
Reverse-range	4.20 to 1
Steer ratios:	
Low-range	1.81 to 1
High-range	1.23 to 1
Reverse-range	2.34 to 1
Hydraulic torque converter:	
Type	Single-stage, multiphase
Max torque multiplication ratio (at stall)	4.0 to 1
Shift and steer control:	
External	Mechanical
Internal	Hydraulic
Range control:	
Low	Friction band
High	Multiplate clutch
Reverse	Friction band
Steer control	Two multiplate clutches
High-range and steer control clutches	Wet, multiplate, hydraulic-applied, spring-released
Low- and reverse-range friction bands	Hydraulic servo-applied, spring-released

Brakes (combination service and parking) . . . . . Wet, multiplate, mechanical-applied, spring-released, external adjustment

Power takeoff . . . . . 1. input driven

Oil system:

Input-driven pump . . . . . 2-gear, positive displacement
Output-driven pump . . . . . 2-gear, positive displacement
Oil filter . . . . Full-flow. convolute wire mesh

Capacity (including oil coolers):
Initial fill . . . .90 US qt (85 liters) (approx)
Refill . . . .68 US qt (64 liters) (approx)

Oil specifications
Ambient temp above -10°F (-23°C) . . . . . MIL-L-2104, Grade 10

NOTE

Do not use MIL-L-46167 when ambient temperature is-consistently above -10°F (-23°C). If auxiliary preheating equipment is available and sump temperature can be raised to -10°F (-23°C), use MIL-L-2104, Grade 10 oil.

Ambient temp below 0 to -65° F
(-18 to-54°C) MIL-L-46167

NOTE

When changing to a different grade oil, thoroughly flush the system with the oil to be used before refilling.

Break-in, shipping, and storage . . . . . MIL-L-21260, Grade 1

Section III. PRINCIPLES OF OPERATION

1-11 OVERVIEW

This section explains the operating principles of the major components of the CD 850-6A transmissions. The major components, in the order in which they are discussed, are as follows:

a. Front and rear mechanical housings
b. End cover assemblies
c. Straight shaft (Input shaft) and gearing
d. Power takeoff
e. Torque converter
f. Main shaft assembly
g. Low- and reverse-range clutches
h. High-range clutch
i. Output planetary gearing
j. Control valve assembly
k. Steer clutches
l. Steer differential
m. Shouldered shafts (Steer drive shafts) and gearing
n. Brake assemblies

1-12 FRONT AND REAR MECHANICAL HOUSINGS

The front and rear housings are machined from cast aluminum. These two housing assemblies are a matched set and are identified by serial number near the top splitline. Matched front and rear housings make up the transmission housing assembly. The front and rear housings are the main structural members of the transmission. They are machined to provide oil passages, mounting pads, and studding. Jumper tubes and seals are used to connect oil passages between the housings and transmission inner components.

1-13 END COVER ASSEMBLIES

NOTE

The right and left end cover assemblies are similar. The description of one cover assembly applies to the other.

a. Description. Each end cover assembly includes output planetary carrier assembly, brake components, spur gear (output planetary sun gear), spur gear (output steer gear), and thrust washer bearing (output flange). Also included are the brake adjustment components, brake apply mechanism, and spur gear (steer output pinion gear). The end cover is a steel casting which is machined to accommodate the components contained within the assembly.

b. Operation. An end cover is attached to each side of the transmission housing assembly. The covers contain various oil passages, some of which provide lubrication for the attached components. The lifting eyes and mounting flanges for the transmission are cast into the outer surface of the end covers.

1-14 STRAIGHT SHAFT (INPUT SHAFT) AND GEARING

a. Description. The floating input shaft is splined on both ends. The splines on the rear end of the input shaft are inserted into the spur gear (input transfer driven gear) that is part of the input gearing section of the inner unit. The input transfer driving gear drives the spur gear (input transfer driven gear). This in turn is splined and drives the input driven bevel gear, which drives the torque converter shaft (converter input shaft). This gear assembly is also part of the input gearing section of the inner unit. The rear end of the input driving bevel gear shaft is splined for use as a power takeoff.

b. Operation. Input shaft and gearing provide engine drive of the torque converter pump. This occurs at the speed ratio of 1.16 to 1 with respect to engine rpm. This, in turn, provides a 0.862 torque ratio. Direct drive is available through the power takeoff whenever transmission is operating.

1-15 POWER TAKEOFF

a. Description. Power takeoff is available through splines on the rear end of the torque converter input driving bevel gear shaft. Remove cover plate on the rear housing for access to the power takeoff splines.

b. Operation. It can also be used to drive auxiliary equipment.

1-16 TORQUE CONVERTER

a. Description

(1) The torque converter shaft (converter input shaft), is held in place on the right end by the input driven bevel gear assembly and the converter turbine cover assembly. These two assemblies engage a common spline on the converter input shaft. The left end of the converter input shaft is mounted on a bearing.

(2) The torque converter contains four main elements: pump, turbine, torque converter stator (first stator assembly), and transmission stator (second stator assembly). The other parts in this group provide the drive, support, and housings for these four elements.

(3) The torque converter pump is the driving element of the torque converter. The pump is bolted to a turbine cover assembly. The turbine cover assembly is splined to and driven by the torque converter shaft (converter input shaft). The converter pump hub is attached to the pump and rotates on a roller bearing.

(4) The torque converter turbine is the driven element of the torque converter. The turbine is bolted to a transmission flange (converter output shaft flange) which rotates on a ball bearing. The flange is splined to the converter output shaft and the spur gear (high-range clutch hub).

(5) The first and second stator assemblies are the reaction elements of the torque converter. The first and second stators are splined to their respective cams. Bearing rollers are contained in the cam pockets and rotate on the stator race. The stator race is splined to the reaction plate assembly and held stationary.

(6) The converter output shaft is splined to and supported by the converter output shaft flange on the right end. On the left end, it is supported by the spur gear (reverse-range sun gear). The output shaft also is splined to the steer differential carrier assembly.

b. Operation

(1) The torque converter shaft joins the input driven bevel gear and turbine cover assembly on a common spline. The turbine cover assembly is bolted to the converter pump. Engine torque is delivered through the input gears and torque converter shaft to the turbine cover assembly. Thus, the attached converter pump rotates any time the engine is running.

(2) During operation, engine torque is transmitted by the bevel gears to the converter pump through the torque converter shaft. When the engine is at idle speed, little movement is imparted to the oil within the converter cavity. The converter acts as a disengaged clutch.

(3) When the engine is accelerated, the vanes of the converter pump force the oil radially outward and forward onto the turbine vanes. The impact of the accelerated oil against the turbine vanes causes the turbine to rotate. The turbine transmits the converter torque to the converter output shaft and high-range clutch hub.

(4) Rotation of the turbine redirects the oil through the stators and back to the inner circumference of the pump. When the pump is rotating faster than the turbine, the returning oil strikes the front end of the stator baldes and is deflected in the same direction as the pump is rotating. Thus, the returning oil assists in driving the pump. As the pump turns faster in relation. to the turbine, the velocity of the oil flow within the converter increases and so does the multiplication of torque. Torque multiplication is greatest when the pump is at full speed and the turbine (connected to the transmission gearing), is stalled. When the turbine speed is approximately the same as the pump speed, the stators freewheel in the same direction as the pump, and the converter functions as a fluid coupling.

(5) The converter output shaft is driven by the transmission flange. The output shaft delivers torque from the converter turbine to the reverse-range sun gear and the carrier of the steer differential

1-17 MAIN SHAFT ASSEMBLY

a. Description. The main shaft assembly is supported at each end by the output planetaries and rotates on two needle bearings. The splines on the right end of the shaft engage the splines of the low-range planetary carrier assembly. The splines on the left end engage the reverse-range planetary carrier assembly and left output ring gear hub assembly.

b. Operation. The main shaft rotates within the inside diameter of the converter output shaft. In low-range operation, the main shaft delivers torque from the low-range planetary carrier assembly to the left output ring gear hub assembly. In reverse range, the main shaft delivers torque from the left output ring gear hub assembly to the low-range planetary carrier assembly.

1-18 LOW- AND REVERSE-RANGE CLUTCHES

NOTE

The description and operation for the low-range clutch bands, pistons, and linkage are identical to those of the reverse-range components. They differ only in their function within the selected range. The discussion applies equally to the low-range and reverse-range components.

a. Description

(1) The low-range clutch band assembly consists of three band linings bonded to the clutch band. An anchor strut and an apply strut are attached to the clutch band with pins.

(2) The servo piston assembly is located in the rear housing under the piston cover. The piston is activated by hydraulic pressure and returned by force from a spring. A servo actuating lever and links are the principal linkage components. They transmit the action of the piston to the clutch band assembly.

b. Operation

(1) When the selector valve is positioned in the desired range (low or reverse), hydraulic pressure is directed to the related servo piston. The charged piston moves rearward, which pulls the connected servo actuating lever rearward. The actuating lever acts against the apply strut. This causes the band assembly to contract and hold the associated range drum stationary.

(2) An adjusting screw provides a method to compensate for wear on the friction linings of the clutch band.

1-19 HIGH-RANGE CLUTCH

a. Description

(1) The high-range clutch includes five clutch disks (external-tanged clutch plates), six clutch disks (internal-splined clutch plates), a piston assembly, a clutch hub (integral with low-range sun gear), and twenty-four release springs.

(2) The five external-tanged clutch plates engage three keys which are pressed into the low-range drum. The six internal-splined clutch plates are splined to the clutch hub. The clutch hub is splined to the converter output shaft.

b. Operation

(1) When the high-range clutch is applied, hydraulic pressure pushes the piston against the clutch plates. This locks the clutch plates together. This, in turn, locks the low-range internal gear (attached to the low-range clutch drum) together with the low-range sun gear (integral with high-range clutch hub). With two members of the planetary locked together, the planetary is driven at converter-out speed through the hub splines.

(2) When apply pressure to the clutch is released, the twenty-four compression helical springs (release springs) return the clutch to the released position.

1-20 OUTPUT PLANETARY GEARING

a. Planetary Gearing Principles

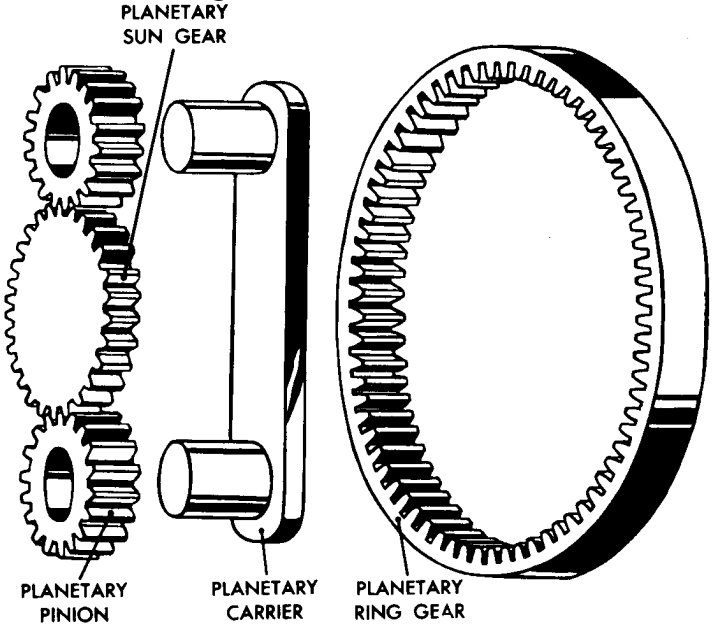
(1) General. Range gearing and output planetary gearing deliver output torque from the converter to the output flanges. Knowledge of simple planetary gear assembly operation will be useful in understanding the explanations in this manual.

(2) Members of a Planetary Gear Assembly

(a) A simple planetary gear consists of four members:

(1) Planetary sun gear.
(2) Two or more planetary pinions.
(3) Planetary ring gear.
(4) Planetary carrier

(b) The sun gear meshes with the planetary pinions, which are attached to the carrier. The pinions mesh with the ring gear. In the planetary gear system, the gears are in constant mesh. In the conventional transmission, the gears must be slid into mesh.



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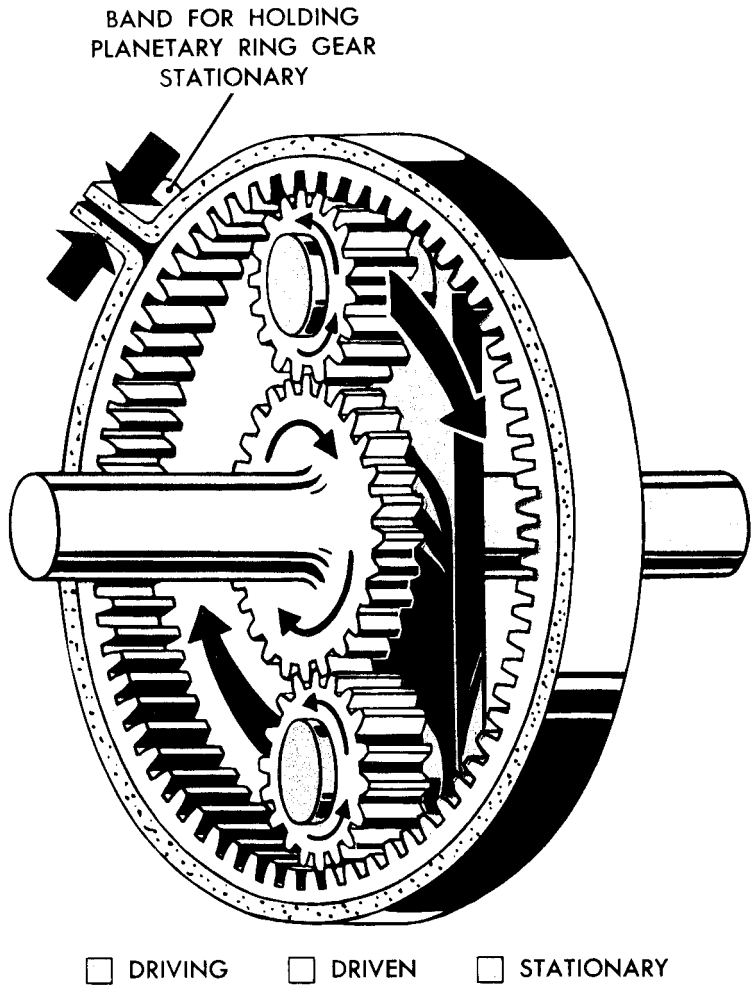
(c) To obtain the needed reduction, or variation, in torque multiplication, one member of the planetary unit must be held stationary. The other two members become the driving and driven members.

(d) The figure below illustrates, in color, a simple method of holding a member of a planetary unit. In this example, the ring gear is held by a band. The sun gear is the driving member and the carrier is the driven member. Note the direction of rotation of each moving element.



(3) Output Combinations

(a) Any one of the three members (the sun spur gear, carrier, or internal gear), can be the stationary member. Either of the other two can be the driving member. This makes six output combinations possible.

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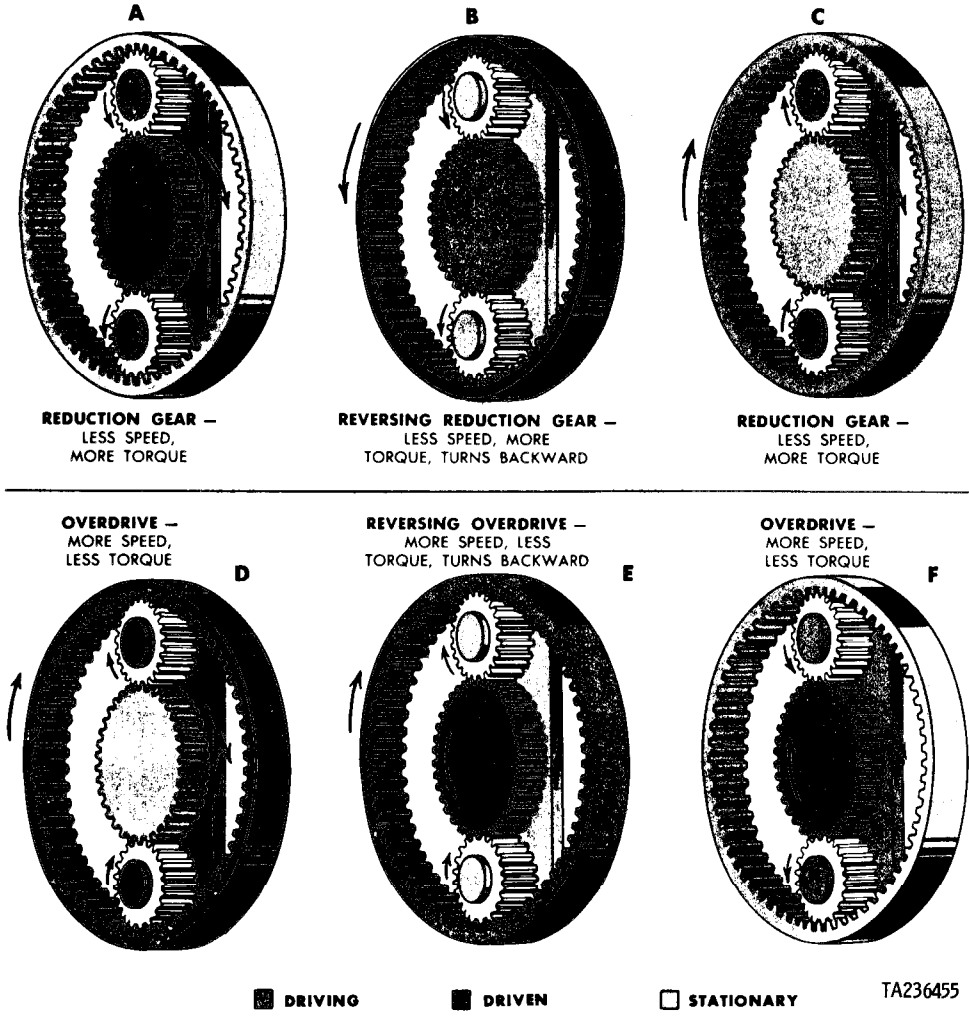
(b) The figure on this page illustrates, in color, the six possible output combinations of a simple planetary unit. They are illustrated only to show principles of operation. Normally, no planetary transmission would use all six output combinations.

(c) Under A in the figure on this page, the input torque is transmitted to the sun spur gear clockwise as viewed. As a result, the planetary pinions must also rotate. Since the internal gear is being held, the planetary pinions rotate on their own shafts. They rotate within the internal gear, taking the planetary carrier with them. This makes the planetary carrier the driven member (output member). The planetary carrier will be turning more slowly than the sun spur gear, and in the same direction.

(d) Speed reduction ratio depends upon size of the gears and relationship of the grounded, driving, and driven members. When planetary sun gear and planetary pinions are the same size, the ratio is 4:1. This means speed is reduced to one quarter, and torque is increased 4 times.



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b. Low-range Planetary Gearing

(1) Description

(a) Planetary gearing for low-range includes a sun gear which is integral with a high-range clutch hub, a low-range internal gear assembly, and a low-range planetary carrier assembly. The planetary carrier assembly consists of a carrier, a hub, and four pinions which are mounted on spindles and rotate on bearing rollers.

(b) Washers position the bearing rollers and pinions, and absorb the pinion end-thrust forces. The spindles are pressed into the carrier and held in place with four setscrews. Six bolts attach the hub to the carrier.

(2) Operation

(a) In low-range operation, the low-range band assembly is applied and holds the low-range internal gear stationary. The sun gear, is driven by the transmission flange (converter output shaft flange). It causes the pinions to travel within the circumference of the stationary internal gear. The travel of the pinions causes the planetary carrier to rotate and drive the internal gears of the output planetaries.

(b) The internal gear of the right output planetary is bolted directly to the low-range planetary. Torque to the internal gear of the left output planetary is delivered through the splines of the main shaft assembly, to the hub assembly.

c. Reverse-Range Planetary Gearing

(1) Description

(a) Planetary gearing for reverse-range includes sun spur gear assembly, internal gear, and planetary carrier assembly. The planetary carrier assembly consists of a carrier, a carrier drum, and four pinions mounted on spindles rotating on bearing rollers.

(b) Washers position the bearing rollers and pinions, and absorb the pinion end-thrust forces. The spindles are pressed into the carrier and held in place with four setscrews. Six bolts attach the carrier drum to the carrier.

(2) Operation

(a) In reverse-range operation, the reverse-band assembly is applied and holds the planetary carrier stationary. The sun spur gear, driven through the converter output shaft, causes the pinions to rotate.

(b) Rotation of the pinions drives the internal gear. It is bolted to the hub assembly and to the internal gear of the left output planetary assembly. Torque to right output internal gear is delivered from the left hub assembly, through the splines of the main shaft assembly, to the low-range planetary carrier assembly. The internal gear is bolted to the carrier assembly.

d. Output Planetary Gearing — Left and Right

NOTE

The description and operation for the two output planetaries are identical.

(1) Description

(a) The output planetary gearing includes an internal gear, a planetary carrier assembly, and a sun spur gear bolted to the output steer spur gear. The planetary carrier assembly consists of a carrier, a shaft, and four pinions mounted on spindles and rotating on rollers.

(b) Washers position the bearing rollers and pinions and absorb the pinion end-thrust forces. The spindles are pressed into the carrier and held in place with four setscrews. Six bolts attach the shaft to the carrier. The output flange is splined to the shaft of the carrier assembly.

(2) Operation

(a) The internal gear is the driving member and the planetary carrier is the driven member of the output gearing. The sun spur gear is driven slowly by the attached output-steer spur gear. The sun spur gear (although not stationary) acts as the reaction member of the output planetary.

(b) The internal gear drives the pinions around the slower sun spur gear. The pinions, being attached to the carrier, cause the carrier to rotate. The splined shaft of the carrier transmits torque to the thrust washer bearing (output flange).

1-21 CONTROL VALVE ASSEMBLY

a. Description

(1) The control valve assembly is located on the top-center pad of the rear housing. The control valve assembly includes a valve body, main-pressure regulator valve assembly, converter transmission valve (check valve), lubrication-pressure regulator valve, transmission valve (shift control valve), right- and left-steer valves, converter pressure regulator valve, and main-pressure relief valve.

(2) The control valve assembly is the control center for the entire hydraulic system. The valve body contains various oil passages and ports which direct the flow to passages in the rear housing.

b. Operation

(1) The control valve body receives oil from the input and output pumps through the main oil filter and into the main oil supply line. This supply line delivers oil to the main-pressure regulator valve, shift control valve, and steer valves.

(2) The main-pressure regulator valve, located in the center bore, is actuated by main pressure working against springs. When the spring and hydraulic forces are in balance, main pressure is regulated. After the main-pressure requirements are satisfied, the main-pressure regulator valve directs the excess oil to the converter-in circuit.

(3) The converter regulator valve is actuated by converter-in pressure which forces it against a spring. When the spring and hydraulic forces are in balance, converter pressure is regulated, and the valve directs the excess oil in the converter circuit into the lubrication circuit.

(4) The lubrication-pressure regulator valve is actuated by lubrication pressure which forces it against a spring. When pressure in the lubrication circuit exceeds a predetermined value, the valve opens and allows the excess oil to escape to sump.

(5) The shift control valve is actuated by the shift control valve lever. The valve lever is held in the driver-selected position by a spring-loaded detent. Movement of the shift control valve directs clutch-apply pressure to the proper drive clutch piston.

(6) The right- and left-steer valves are actuated by the steer control valve lever. When steering, the two valves move in opposite directions. Thus, the movement of one valve to charge a steer clutch results in the simultaneous movement of the other valve to exhaust the opposite clutch. During no-steer condition, all apply pressure to the steer clutches is blocked by the steer valves, and both clutches are exhausted. Each steer valve is equipped with a housing, two springs, and a plunger that aids the spring-loaded detent to insure positive centering of the steer valves during straight travel.

1-22 STEER CLUTCHES

NOTE

The left-steer clutch and right-steer clutch are similar and have many interchangeable components. The descriptions below apply to either clutch.

a. Description

(1) The steer-clutch housing assembly is made from a steel casting. Two caps are matched to the two pillow blocks located at the top of the clutch housing. The caps and clutch housing are serialized to identify the matched set. The steer-clutch housing contains a steer-differential carrier assembly which is centered between the right- and left-steer clutch packs.

(2) The steer-clutch assembly includes a piston, a piston seal, a clutch hub, an apply plate, a steer internal gear, six internal-splined clutch disks, five external-tanged clutch disks, a reaction plate, and a back plate. Six clutch release springs, three anchor keys, and six spring guide pins complete the clutch assembly.

(3) The internal-splined clutch disks engage the splines of the steer-clutch hub. The external-tanged disks are held stationary by the anchor keys.

b. Operation

(1) When the steer clutch is applied, hydraulic pressure pushes the piston against the clutch disks. The resulting friction between the disks causes the internal-splined disks to rotate slower or to stop. This action slows or stops the steering-clutch hub, which is attached to the steer-clutch internal gear.

(2) A lubrication valve is attached to the steer clutch apply plate. Thus, when the clutch is applied, the lubrication valve is lifted from its seat and allows hydraulic fluid to cool the working clutch. When the clutch is released, the springs return the disks to their released position. Return of the apply plate causes the lubrication valve to seat, stopping coolant flow to the clutch.

1-23 STEER DIFFERENTIAL

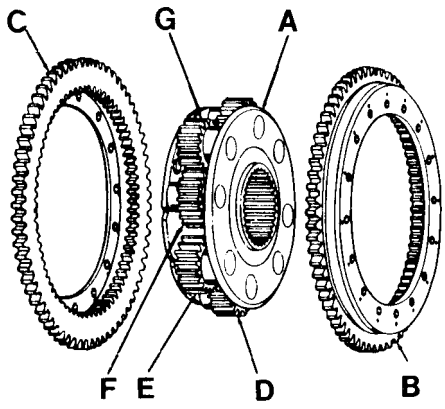
a. Description

(1) The steer differential includes a differential planetary carrier assembly, a right-steer internal gear, and a left-steer internal gear. The planetary carrier assembly includes a carrier, and two sets of four pinions which are mounted on spindles and rotate on bushing-type bearings.

(2) The right- and left-steer internal gears are in mesh with their respective sets of planetary pinions and the two spur gears (steer-shaft drive gears). The planetary carrier is splined to the converter output shaft.

b. Operation

(1) Differential carrier (A) rotates whenever the converter turbine is rotating. The differential action, which permits either left steer ring gear (B) or right steer ring gear (C) to rotate faster than the other, occurs in differential carrier (A). The two sets of planetary pinions mounted on the carrier are in mesh with each other. However, each pinion meshes with only one other pinion. The steer pinion groups are called the left set and the right set. Each set contains four pinions. No. 1 pinion (D) of the left set meshes with No. 1 pinion (E) of the right set; No. 2 pinion (F) of the left set meshes with No. 2 pinion (G) of the right set, and so on.



LEGEND

A. Differential Carrier
B. Left Steer Ring Gear
C. Right Steer Ring Gear
D. Differential Pinion No. 1 of Left Set
E. Differential Pinion No. 1 of Right Set
F. Differential Pinion No. 2 of Left Set
G. Differential Pinion No. 2 of Right Set

(2) When the vehicle is not being steered, the differential carrier revolves just as it does when a steer is applied. Since the steer clutches are not engaged, the internal gears rotate freely and the pinions tend to rotate on their spindles. But with the two sets of differential pinions in mesh, each set attempts to drive the other set in the opposite direction. This opposing drive locks the pinions and causes them to remain stationary on their spindles. With the pinions stationary, the drive from the differential carrier is transmitted through the ring gears to the steer shaft drive gears. The drive gears transmit the drive through the steer drive shafts to the steer output pinion gears located in the left and right end covers. The steer output pinion gears mesh with, and drive, the spur gears (steer output gears), each of which is bolted to a spur gear (output sun gear). In no steer, forward direction, the two output sun gears rotate counterclockwise (viewed from the right side) at the same speed.

(3) When full steer is applied, either the right- or the left-steer differential internal gear is held stationary, depending upon which steer clutch is applied.

NOTE

When partial steer is applied, either the right- or the left-steer differential internal gear is slowed, depending upon which steer is selected. This forces the set of four steer pinions, in mesh with the locked internal gear, to travel around its internal teeth. Since these pinions are also in mesh with the opposite set of four steer pinions, drive is transmitted through the opposite set of pinions to the opposite internal gear. Therefore, when one internal gear is slowed or stopped, the drive to the opposite internal gear is increased proportionately. This differential drive is transmitted to the spur gears (output sun gears). When forward steer is applied, the output sun gears rotate counterclockwise at different speeds (or one rotates clockwise and the other is stopped).

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1-24 SHOULDERED SHAFTS (STEER DRIVE SHAFTS) AND GEARING

a. Description

(1) The left and right drive gears are identical. Steer shaft drive gears are 6-pitch, 69-tooth, steel spur gears. The ID of the gear hubs is machined to provide a 10-pitch, 14-tooth spline.

(2) The right-steer shaft is 30.719 inches long and the left-steer shaft is 14.844 inches long. Both ends of each shaft are splined. The right-steer drive shaft is splined to the right-steer shaft drive gear at one end and to the steer output pinion at the other. The left-steer drive shaft has the same configuration -splined to the left-steer shaft drive gear at one end and to the steer output pinion at the other.

(3) Both steer output pinions are identical, each being a 6-pitch, 31-tooth spur gear. The right-steer output pinion is located in the right end cover and supported by ball bearings. The left-steer output pinion gear is supported in an identical manner in the left end cover on ball bearings. Each steer output pinion is in mesh with its respective steer output gear.

b. Operation

(1) The spur gears (steer shaft drive gears) are in mesh with the differential internal gears and are splined to their respective steer drive shafts. Thus, the steer shaft drive gears transmit torque from the differential internal gears to steer drive shafts.

(2) The steer drive shafts transmit torque from the steer shaft drive gears to the steer output pinions. The steer output pinions drive their respective output steer gears.

1-25 BRAKE ASSEMBLIES

NOTE

The right and left brake assemblies are identical except that some parts are handed for either right or left application. The following description and operation of a single brake assembly will serve for either.

a. Description

(1) The major components of each brake assembly are six stationary plates, seven rotating plates, and a brake anchor. Included in the brake assembly are a shouldered shaft (brake apply shaft), a lever assembly) a strut, a bracket assembly, a valve assembly, and related attaching parts.

(2) The six stationary plates are splined to the brake anchor which is attached to the end cover. The seven rotating plates are splined to the brake hub which is attached to the output planetary carrier. The lever asssembly, splined to the shouldered shaft, acts against the strut. The strut is in contact with the bracket assembly attached to the rotating brake apply cam. The stationary cam is attached to the brake anchor.

b. Operation

(1) When the brake pedal is depressed in the operator's compartment, the shouldered shaft is rotated. This rotation is transmitted to the rotating cam ring. As the cam ring rotates, twelve bearing balls are rolled between the cam pockets of the two cam rings. This action forces the rotating ring against the brake apply piston assembly. Movement of the apply piston compresses the transmission plates (rotating plates) between the brake disks. This causes the transmission plates to slow or stop, which, in turn, slows or stops the output carrier and the output flange.

(2) Simultaneously with the movement of the brake rotating cam ring, the brake cooling oil valve allows oil from the output pump to flood and cool the brake plates.

(3) When the brake pedal is released, a spring returns the rotating cam ring to its released position. This movement of the cam ring causes the cooling oil valve to stop the coolant flow to the brake plates. Simultaneously, twelve springs return the brake plate to the released position.

Section IV. HYDRAULIC SYSTEM OPERATION

1-26 OVERVIEW

This section contains an explanation of the main oil supply, torque converter and lubrication oil systems, system controls, and the hydraulic actions that occur during the different operating conditions. A color-coded schematic of the hydraulic system is presented on the next page. The schematic illustrates the hydraulic functions within the transmission and will be helpful during study of the text.

1-27 MAIN OIL SUPPLY SYSTEM

a. Input-Driven Pump

(1) The input-driven pump of the CD 850-6A transmission draws oil from the sump through the center oil tube assembly and directs it through the filter assembly to the control valve body.

(2) The input-driven pump of the CD 850-6A-1 transmission draws oil from the sump through an inlet tube assembly which is an integral part of the pump assembly. The pump also has a bypass valve which opens when inlet pressure to the converter is excessive.

(3) The input driven pump operates any time the engine is running.

b. Output-Driven Pump

(1) The output-driven pump of the CD 850-6A draws oil from the sump through the side oil tube assembly.

(2) The output-driven pump of the CD 850-6A-1 transmission draws oil from the sump through an inlet tube assembly which is an integral part of the pump assembly.

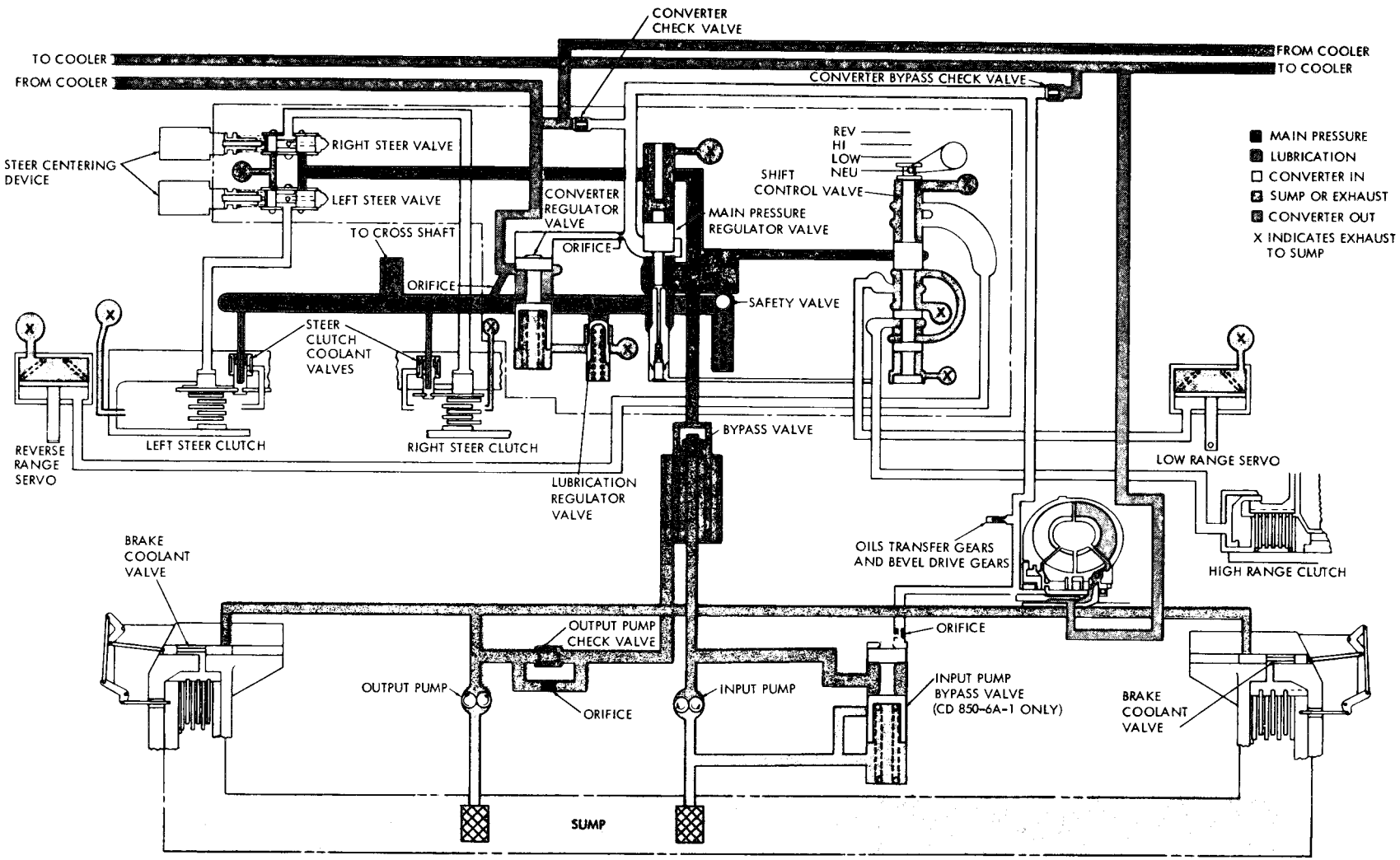
(3) The output-driven pump assists the input-driven pump in satisfying system requirements and operates when the left track of the vehicle is moving forward. However, when the left track of the vehicle is driving in reverse, the pump does not deliver oil to the system and the transmission valve (check valve) in the pressure line closes to prevent back pumping.

(4) The brake coolant requirements are also satisfied by the output-driven pump. During brake application, the output pump transmission valve (check valve) closes, and the output pump furnishes the cooling oil to the brakes. Because the pump operates only when the left track is moving forward, pressure and flow in the coolant line approaches zero as the vehicle comes to a stop.

c. Main-Pressure Regulator Valve

(1) The main supply oil (red) from the input and output pumps enters the control valve body and surrounds the main-pressure regulator valve. The oil acts against the upper and lower valve land. The upper land has a greater area. Thus, the net force pushes the valve upward against the two springs. This movement allows the excess oil to escape into the converter-in circuit (yellow). Thus, main pressure is regulated when the hydraulic and spring forces are in balance. An orifice in the regulator valve stem also allows oil to flow through a transmission valve (check valve) into a cavity to act against a slip pin in the lower end of the valve. The trapped oil can escape only by seeping past the pin shank. In this way trapped oil dampens pulses in the circuits and protects against valve chatter.

(2) If the oil supply to the main-pressure regulator valve becomes too great, or, if the oil is cold and does not flow easily, the safety valve will open. This will allow the oil to escape into the lubrication circuit (green).


CONVERTER CHECK VALVE
TO COOLER
FROM COOLER
FROM COOLER
TO COOLER
CONVERTER BYPASS CHECK VALVE
STEER CENTERING DEVICE
RIGHT STEER VALVE
LEFT STEER VALVE
TO CROSS SHAFT
ORIFICE
CONVERTER REGULATOR VALVE
ORIFICE
MAIN PRESSURE REGULATOR VALVE
REV
HI
LOW
NEU
SHIFT CONTROL VALVE
SAFETY VALVE
STEER CLUTCH COOLANT VALVES
REVERSE RANGE SERVO
LEFT STEER CLUTCH
RIGHT STEER CLUTCH
LUBRICATION REGULATOR VALVE
BYPASS VALVE
LOW RANGE SERVO
OILS TRANSFER GEARS AND BEVEL DRIVE GEARS
HIGH RANGE CLUTCH
BRAKE COOLANT VALVE
OUTPUT PUMP CHECK VALVE
ORIFICE
OUTPUT PUMP
ORIFICE
INPUT PUMP
INPUT PUMP BYPASS VALVE (CD 850-6A-1 ONLY)
BRAKE COOLANT VALVE
SUMP
MAIN PRESSURE
LUBRICATION
CONVERTER IN
SUMP OR EXHAUST
CONVERTER OUT
X INDICATES EXHAUST TO SUMP

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1-28 TORQUE CONVERTER OIL SYSTEM

a. Converter Pressure Regulator Valve

(1) An oil orifice in the converter-in circuit (yellow) allows converter-in pressure to act upon the converter pressure regulator valve. This pressure pushes the valve downward against its spring, which allows converter oil returning from the cooler to escape into the lubrication circuit (green).

(2) An orifice located next to the regulator valve provides flow from the converter-out circuit (orange) to the lubrication system, regardless of the position of the regulator valve.

b. Converter Bypass and Transmission Valves (Check Valves)

These two valves compensate for the different operating conditions imposed on the torque converter. At low speed and heavy load the check valve in the converter-out circuit (orange) opens to the converter for cooling. At high speed and light load the flow requirement in the converter-in circuit (yellow) is not as great, and the excess oil escapes through the bypass valve.

1-29 LUBRICATION OIL SYSTEM

Oil returning from the cooler enters the lubrication circuit (green) through a fixed orifice and the converter-pressure regulator valve. Oil also enters via the main safety valve. The lubrication circuit directs lubricating oil to the various points in the power train that require positive lubrication. This circuit also feeds cooling oil to the steer clutches when they are engaged. Oil in excess of that required to meet system requirements is directed to the sump (blue) through the lubrication-pressure regulator valve.

1-30 HYDRAULIC CONTROL SYSTEM

a. General

The hydraulic control system directs oil to the clutch and band pistons for range selection and steer. Main oil pressure (red) is directed to the shift control valve and steer control valves in the control valve body assembly.

b. Control Valves

The shift control valve and two steer valves are the control valves for drive range ratio and directional control. These valves direct the oil through internal passages for the hydraulic application of a clutch, or band, selected for specific operation of the vehicle.

1-31 HYDRAULIC ACTION

a. Neutral, No-Steer Operation.

When the shift control valve is in neutral, and the steer lever is in the no-steer detent, main-pressure (red) cannot act upon the control valves. Both steer clutches are open to exhaust.

b. Low-Range Operation

Movement of the shift control valve to the low-range position directs main-pressure oil to the low-range servo piston. In this position, the high-range port and the reverse-range port index with an exhaust port in the valve bore.

c. High-Range Operation

Movement of the selector valve to the high-range position directs main oil pressure to the high-range clutch and to the small end of the main-pressure regulator valve. Therefore, when in high-range, oil pressure is acting on the area of the small end of the valve as well as on the differential area between the small and large diameters. Thus, oil pressure acts upon a greater total valve area and less oil pressure is required to balance the spring force. When the selector valve is in the high-range position, both the low-range apply port and the reverse-range port are indexed with an exhaust port in the valve bore.

d. Reverse-Range Operation

Movement of the shift control valve to the reverse-range position directs main-pressure oil to the reverse-range servo piston. In this position, the other range ports index with exhaust ports in the valve bore.

e. Right-and Left-Steer Operation

(1) When the steer valves are in the no-steer position, main-pressure is blocked at the valve bores.

(2) When the vehicle is being steered, the two steer valves move in opposite directions. Thus, movement of one valve allows apply pressure to charge the selected steer clutch. The simultaneous movement of the other valve exhausts the opposite steer clutch.

(3) The clutch-apply pressure is regulated by mechanical movement of the valve against both spring and hydraulic pressures. Thus, the amount the operator moves the steer control determines the degree of turning radius. The greater the movement, the shorter the turning radius.

Section V. TRANSMISSION TORQUE PATHS

1-32 OVERVIEW

This section describes how engine torque is transmitted through the transmission. Torque paths are described for the input components, for neutral-, low-, high-, and reverse-range operation, and for left- and right-steer within each of the operating ranges. Color-coded schematics are presented to illustrate each torque path.

NOTE

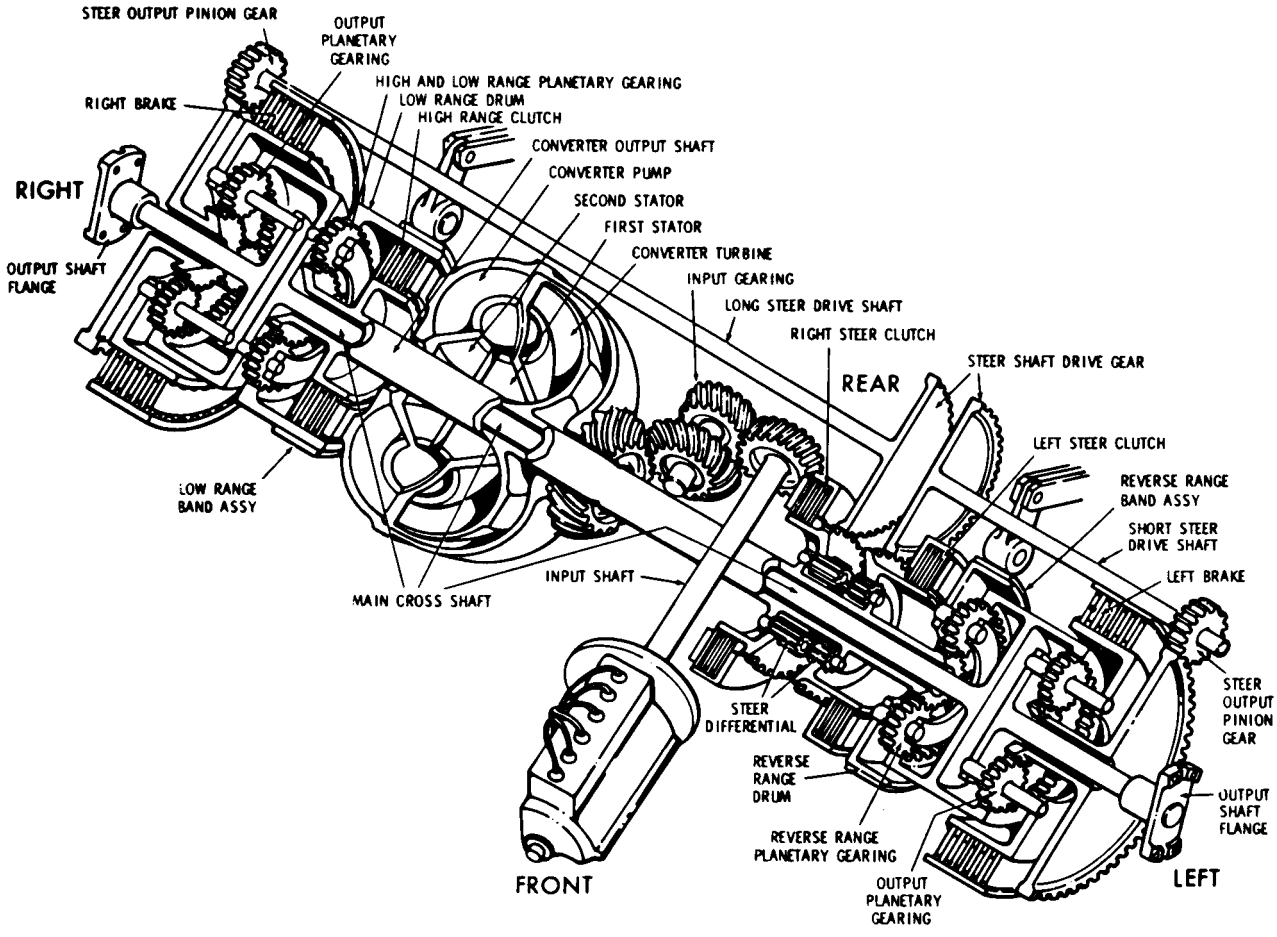
The direction of rotation of gears, carriers, shafts, etc., is expressed in terms of clockwise and counter-clockwise rotation. Clockwise and counterclockwise rotation is determined by viewing the transmission from the right side.

1-33 INPUT TORQUE PATH

Engine power is transmitted to the transmission through the straight shaft (input shaft). The straight shaft splines into (and drives) the input transfer driving gear. This gear meshes with (and drives) the input transfer driven gear. The input transfer driven gear splines to the shaft of the input driving bevel gear, which meshes with and drives the input driven bevel gear. This gear is mounted on, and drives, the torque converter shaft (converter input shaft) (not shown), which revolves around the main cross-drive shaft and converter output shaft. The torque converter shaft is splined to the turbine cover which is the driving member of the torque converter.

NOTE

Splines on the rear end of the shaft of the input driving bevel gear provide direct torque for power takeoff.

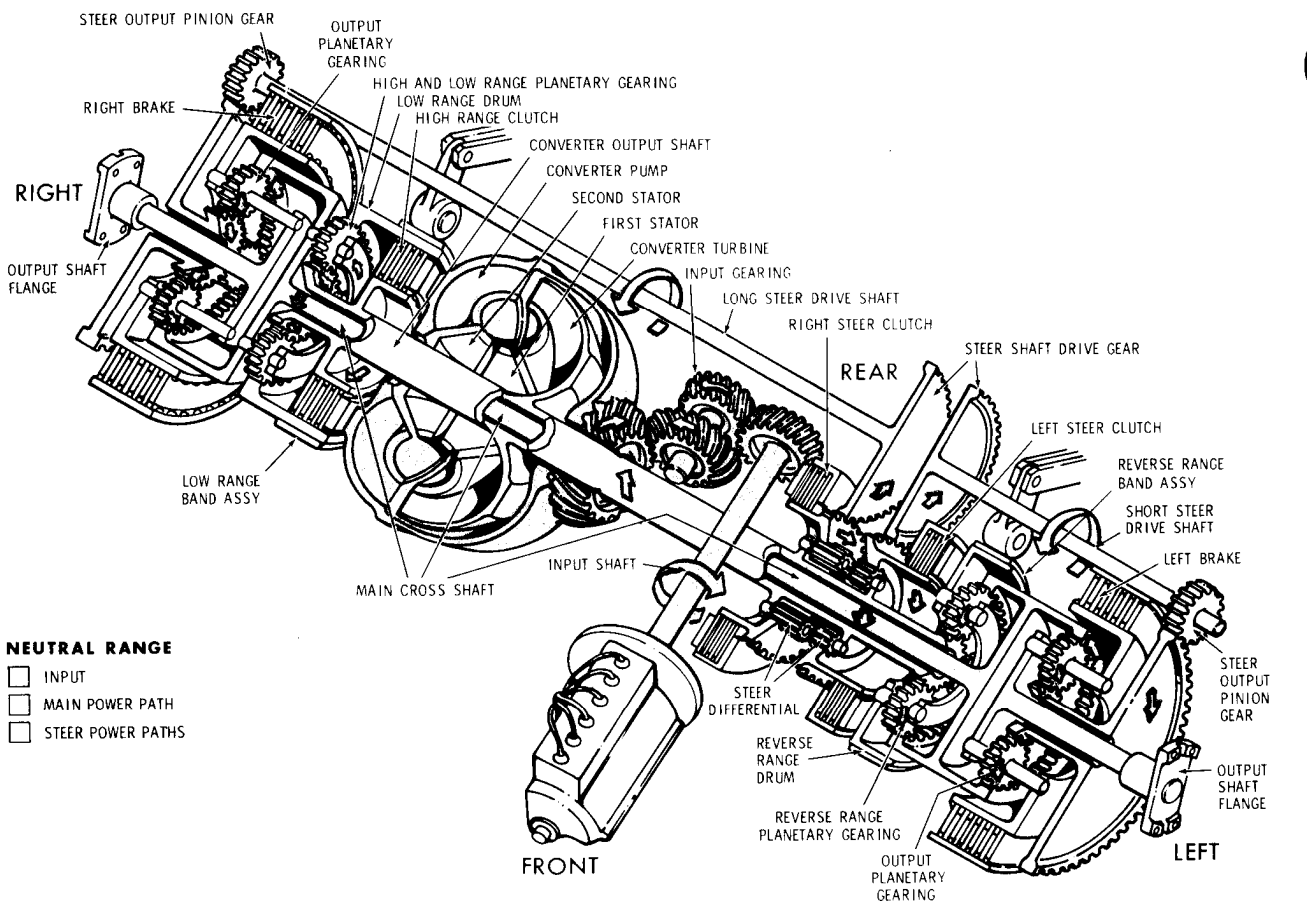


TA236458

1-34 NEUTRAL-RANGE TORQUE PATH

a. In neutral-range (no-steer) operation, no torque is transmitted to the output flanges. The torque from the engine is absorbed in a circular path within the transmission. Drive from the converter causes rotation of the converter output shaft and the spur gear (high-range clutch hub with integral low-range sun gear). The converter output shaft drives the steer differential and spur gear (reverse-range sun gear).

b. The differential steering hub (differential carrier), drives the differential ring gears at the same speed because neither steer clutch is engaged. Thus, the drive is directed equally through the steer drive gears and shafts to the steer output pinions which, in turn, drive the spur gears (steer output gears). Rotation of the spur gears drives the attached output planetary sun gears, which are in mesh with the output planetary pinions. The pinions, in turn, drive the output ring gears.



TA236459

c. Rotation of the right output ring gear drives the low-range carrier, which drives the low-range pinions and main cross-drive shaft. The low-range pinions, being driven by the carrier and the rotating sun gear, drive the low-range ring gear. The ring gear rotates freely because neither the high-range clutch nor low-range band is applied.

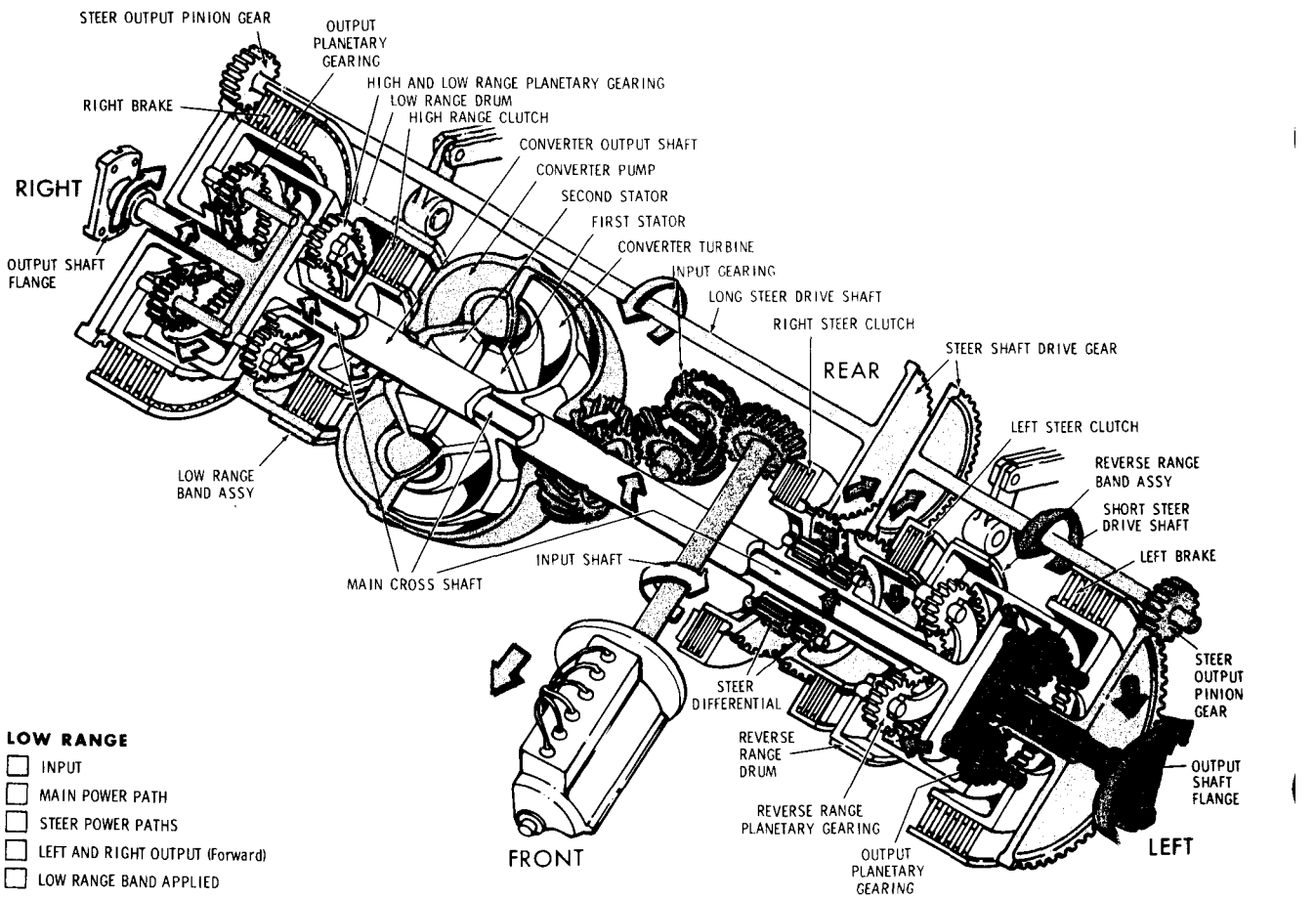
d. Rotation of the left output ring gear drives the attached reverse-range and output ring gear hub assembly and reverse-range ring gear. The reverse-range pinions, being driven by the ring gear and rotating sun gear, drive the carrier. The carrier rotates freely because the reverse-range band is not applied. The reverse-range and output ring gear hub assembly drives the main cross-drive shaft at the same speed and direction as the low-range carrier does at the opposite end. Thus, the circular path of the driving components follows the steer paths to each side of the transmission, only to be connected by the main cross-drive shaft.

1-35 LOW-RANGE TORQUE PATH

a. The torque path in low-range operation is almost the same as that described for neutral-range operation. However, in low-range operation, the low-range servo piston is applied, which extends the torque path to the output flanges. When the low-range piston is applied, the low-range band holds the low-range drum and attached ring gear stationary. The rotating low-range sun gear drives the low-range pinions within the stationary ring gear. The pinions, being mounted to the low-range carrier, cause the carrier to rotate. The carrier drives the attached output ring gear and the main cross-drive shaft.

b. The main cross-drive shaft delivers the same torque to the other output ring gear through the splines of the reverse-range and output ring gear hub assembly.

c. Thus, the two output ring gears drive the output pinions around the more slowly rotating sun gears. This causes the output carriers to rotate and drive the attached output flanges. Both output flanges rotate at the same speed and in the same direction.



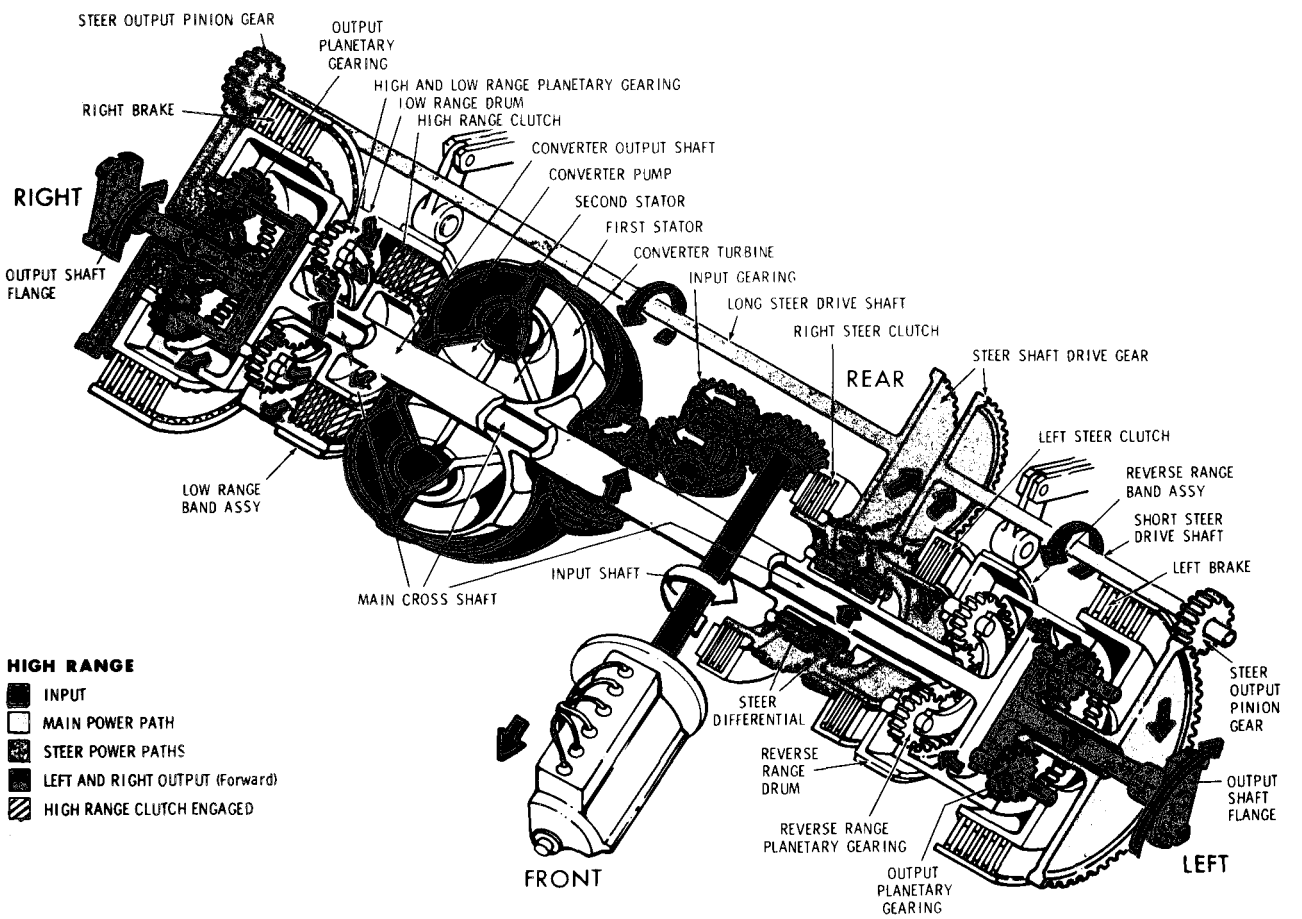
TA236460

1-36 HIGH-RANGE TORQUE PATH

a. The torque path in high-range operation is almost the same as that described for neutral-range operation. The difference is that the highrange clutch is applied. When the high-range clutch is engaged, it locks the low-range sun gear, through the spur gear (high-range clutch hub), to the attached low-range ring gear. When two members of a planetary are locked together, the planetary rotates as a unit. Thus, the low-range planetary is driven at converter output speed. Rotation of the low-range carrier drives the attached output ring gear and the main cross-drive shaft.

b. The main cross-drive shaft delivers the same torque to the other output ring gear through the splines of the reverse-range and output ring gear hub assembly.

c. The two output ring gears drive the output pinions around the more slowly rotating sun gears. This causes the output carriers to rotate and drive the attached output flanges. Both output flanges rotate at the same speed and in the same direction.



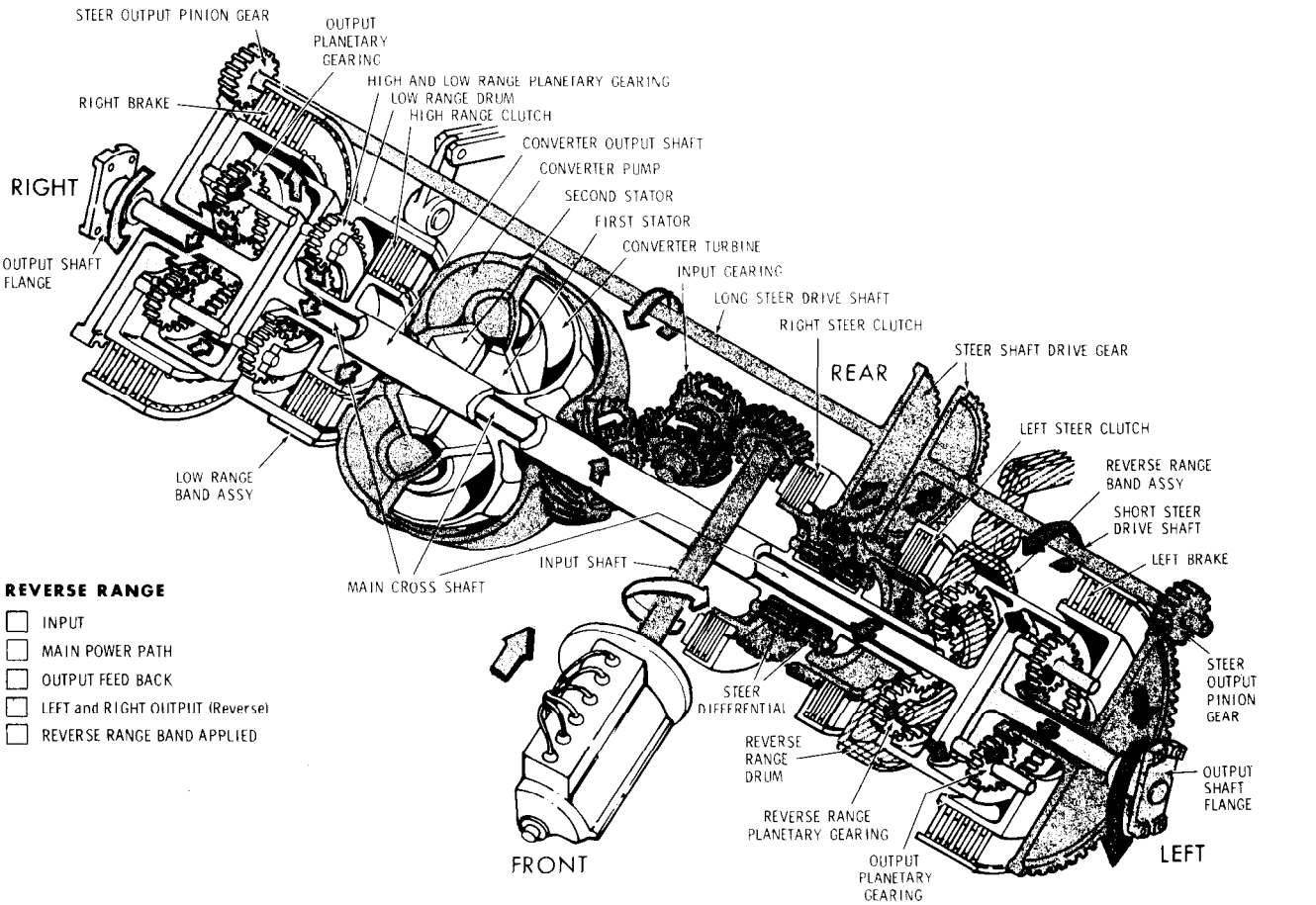
TA236461

1-37 REVERSE-RANGE TORQUE PATH

a. The torque path in reverse-range operation is almost the same as that described for neutral-range operation. In this instance the reverse-range servo piston is applied. When the reverse-range piston is applied, the brake band assembly (reverse-range band), holds the reverse-range drum and attached reverse-range carrier stationary. The spur gear (reverse-range sun gear), being driven by the converter output shaft, causes the reverse-range planetary pinions to rotate clockwise (as viewed from right side) on their spindles. These pinions transfer their clockwise rotation to the reverse-range ring gear. The reverse-range ring gear is bolted to the reverse-range and output ring gear hub assembly and to the output ring gear. Thus, the output ring gear is driven in a clockwise rotation, as is the main cross-drive shaft, which is splined to the hub assembly.

b. The main cross-drive shaft delivers the clockwise rotation to the other output ring gear through the low-range carrier.

c. Thus, the two output ring gears drive the output pinions clockwise around the slower sun gear that is being driven in a counterclockwise (as viewed from right side) direction. This causes the output carriers, and the attached output flanges, to move at the same speed in a clockwise direction, which moves the vehicle in reverse.



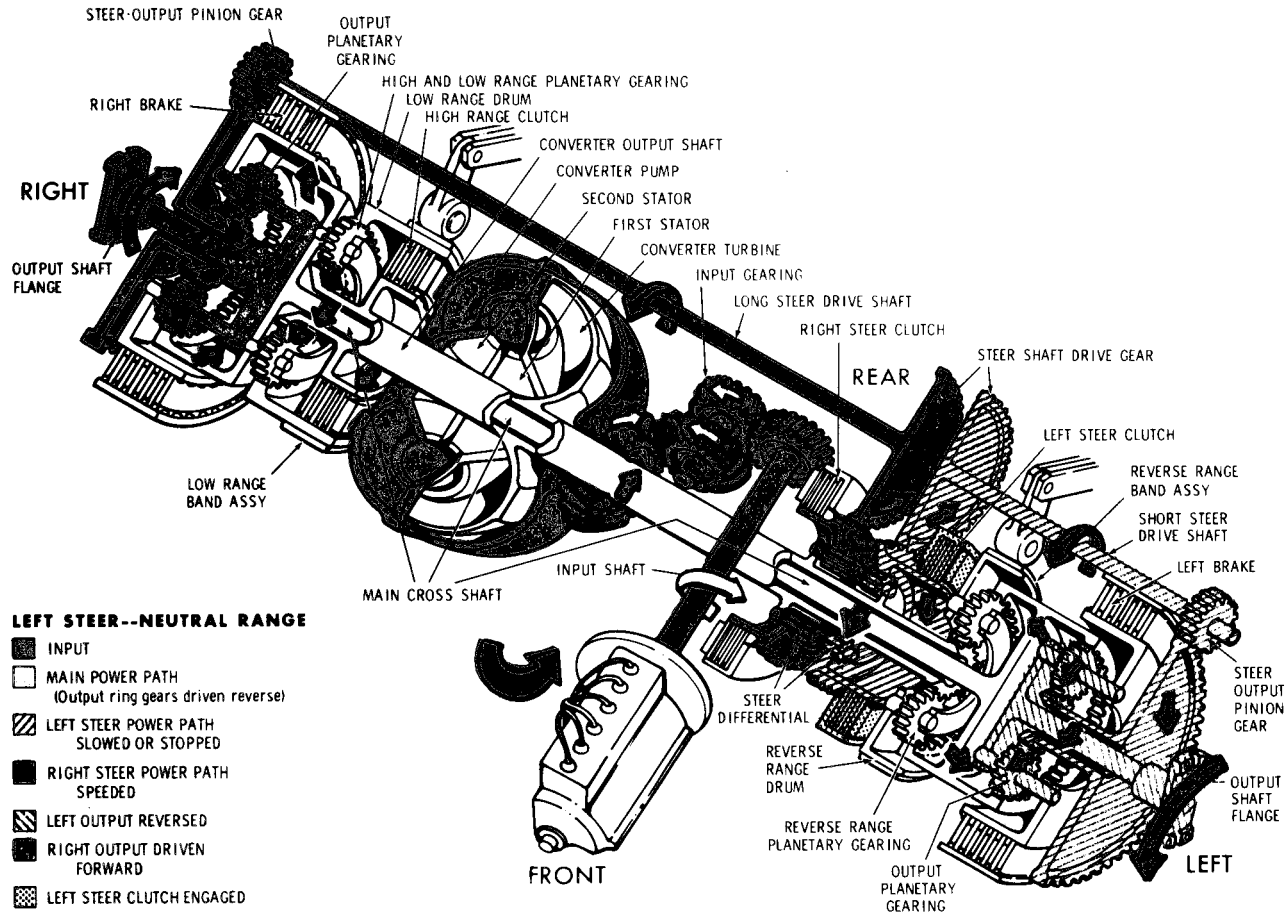
TA236462

d. In reverse-range, the clockwise rotation of the output pinions applies counterclockwise torque to the output sun gear. This torque is fed back through the steer power path to assist the converter output shaft. Consequently, in reverse-range, there is less speed but more torque.

1-38 LEFT-STEER, NEUTRAL-RANGE TORQUE PATH

NOTE

When steering the vehicle, partial steer or full steer may be applied. If partial steer is applied, one of the spur gears (output sun gears) will be slowed and the opposite spur gear (output sun gear) will be speeded up proportionately. If full steer is applied, one of the output sun gears will be stopped and the speed of the opposite output sun gear will be doubled. In each of the following explanations of steering in the various operating ranges, it is assumed full steer is applied. However, in the steer torque path illustrations, the effects of both partial and full steer are shown.



TA236463

a. In neutral, no torque is transmitted to the output flanges. But, when left-steeris applied, engagement of the left-steer clutch stops the left output sun gear. Simultaneously, through the action of the steer differential, the speed of the right output sun gear is doubled in a counterclockwise (as viewed from right side) direction. A clockwise torque is transmitted to the right output pinions, which causes the planetary carrier and attached output flange to rotate counterclockwise (forward). Because the ring gear is free to rotate, the output pinions drive it in a clockwise direction. The attached low-range carrier transmits the torque through the main cross-drive shaft to the left output ring gear.

b. The left output ring gear drives the left output pinions clockwise. However, the sun gear is held stationary. This causes the pinions to drive the carrier and attached output flange in a clockwise direction (reverse).

c. The vehicle pivots to the left because the right output flange rotates counterclockwise (forward) and the left output flange rotates clockwise (reverse).

NOTE

Both flanges rotate at the same speed only if the sprocket loads are equal. If sprocket loads are not equal one track may stop while the other drives.

1-39 RIGHT-STEER, NEUTRAL-RANGE TORQUE PATH

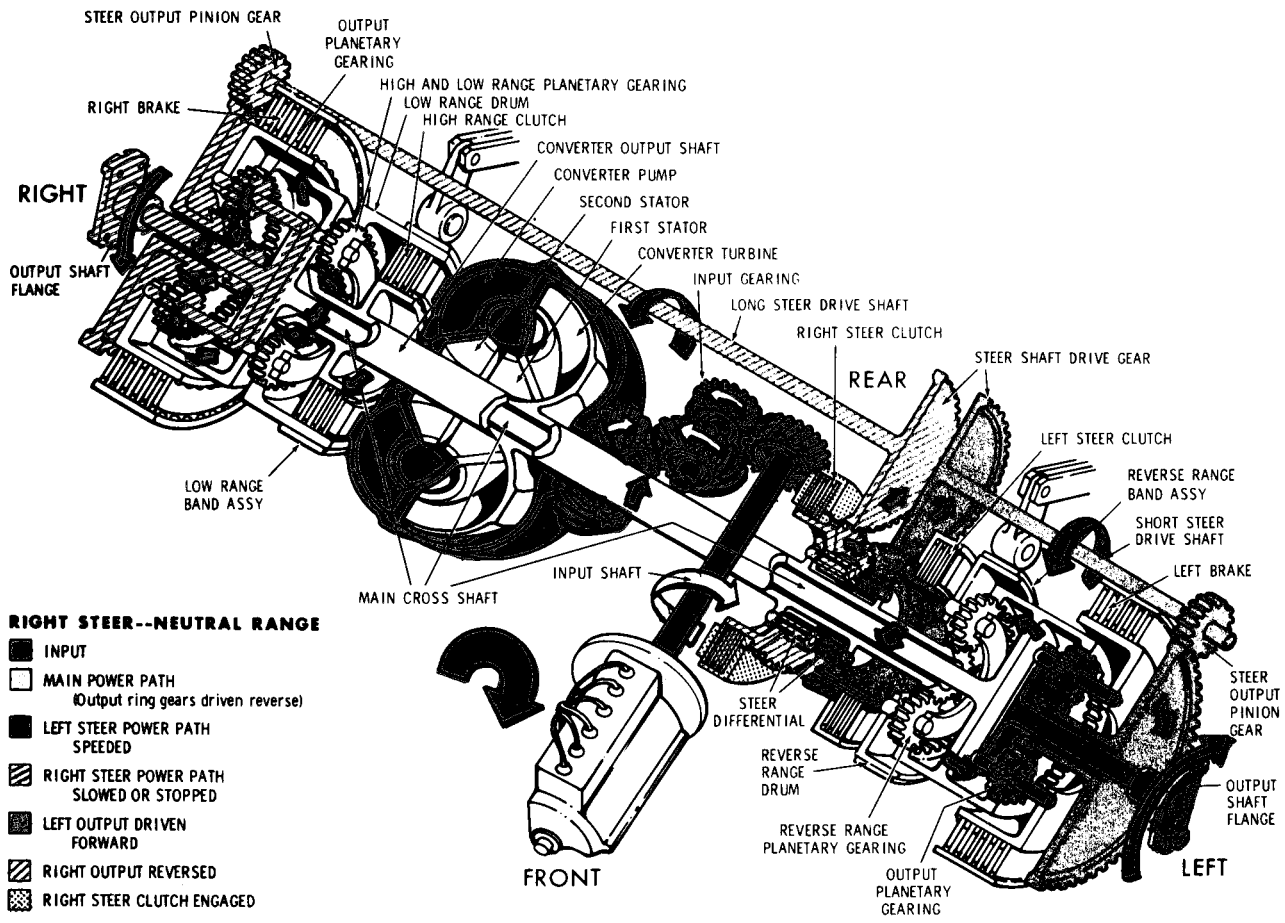
NOTE

When steering the vehicle, partial steer or full steer may be applied. If partial steer is applied, one of the spur gears (output sun gears), will be slowed and the opposite output sun gear will be speeded up proportionately. If full steer is applied, one of the output sun gears will be stopped and the speed of the opposite output sun gear will be doubled. In each of the following explanations of steering in the various operating ranges, it is assumed full steer is applied. However, in the steer torque path illustrations, the effects of both partial and full steer are shown.

a. In neutral, no torque is transmitted to the output flanges. But, when right-steer is applied, engagement of the right-steer clutch stops the right output sun gear. Simultaneously, through the action of the steer differential, the speed of the left sun gear is doubled in a counter-clockwise (as viewed from right side) direction. A clockwise torque is transmitted to the left output pinions which causes the planetary carrier and attached output flange to rotate counterclockwise (forward). Because the ring gear is free to rotate, the output pinions drive it in a clockwise direction. The attached reverse-range and output ring gear hub assembly transmits the torque through the main cross-drive shaft and low-range planetary carrier to the right output ring gear.

b. The right output ring gear drives the right output pinions clockwise. The sun gear is held stationary. This causes the pinions to drive the carrier and attached output flange in a clockwise direction (reverse).

c. The vehicle pivots to the right because the left output flange rotates counterclockwise (forward), and the right output flange rotates clockwise (reverse).



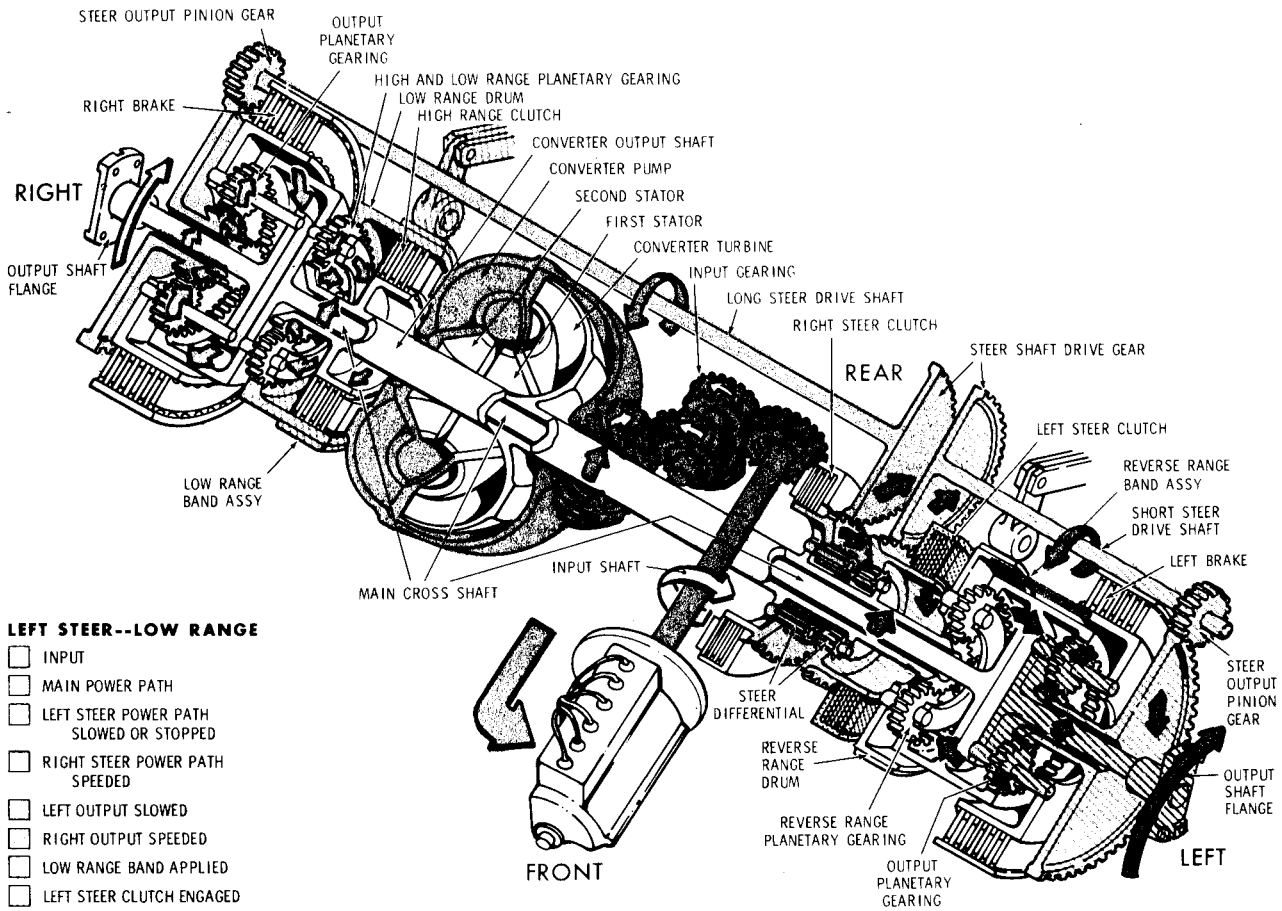
TA236464

1-40 LEFT-STEER, LOW-RANGE TORQUE PATH

a. The low-range torque path through the transmission is the same as that described for low-range operation. When left-steer is applied, engagement of the left-steer clutch stops the left output sun gear. At the same time, through the action of the differential, the speed of the right output sun gear is doubled.

b. The increased speed of the right output sun gear increases the speed of the right output carrier and attached output flange in a counter-clockwise (as viewed from right side) direction (forward). The stationary sun gear, in the left output planetary, decreases the speed of the left output carrier and attached output flange in a counterclockwise direction (forward).

c. The vehicle will steer toward the left because the right output flange rotates faster than the left output flange.



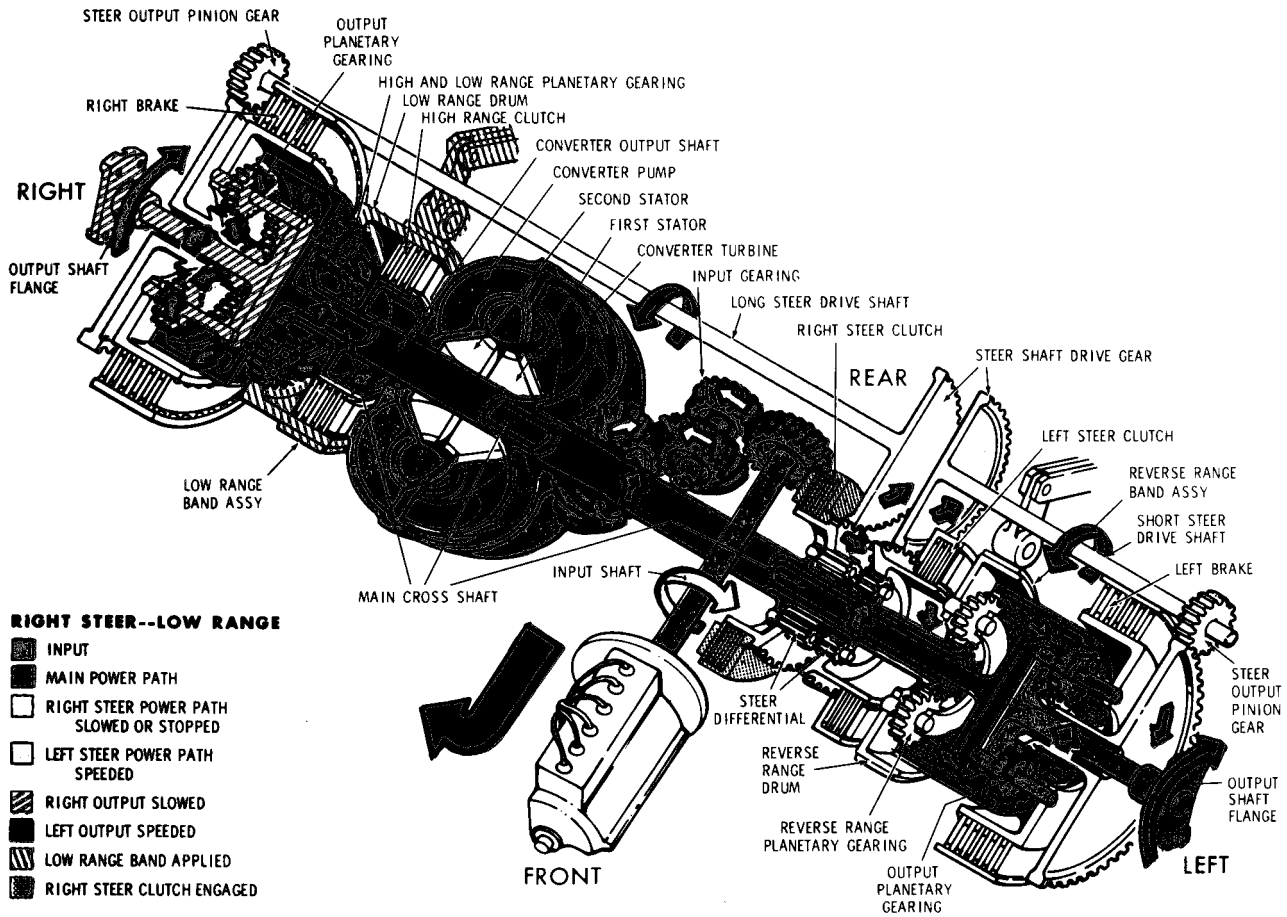
TA236465

1-41 RIGHT-STEER, LOW-RANGE TORQUE PATH

a. The torque path through the transmission is the same as that described for low-range operation except that the right-steer clutch is applied. Engagement of the right-steer clutch stops the right output sun gear. At the same time, through the action of the differential, the speed of the left output sun gear is doubled.

b. The increased speed of the left output sun gear increases the speed of the output carrier and attached output flange in a counterclockwise (as viewed from right side) direction (forward). The stationary sun gear, in the right output planetary, decreases the speed of the right output planetary in a counterclockwise direction.

c. The vehicle will steer toward the right because the left output flange rotates faster than the right output flange.



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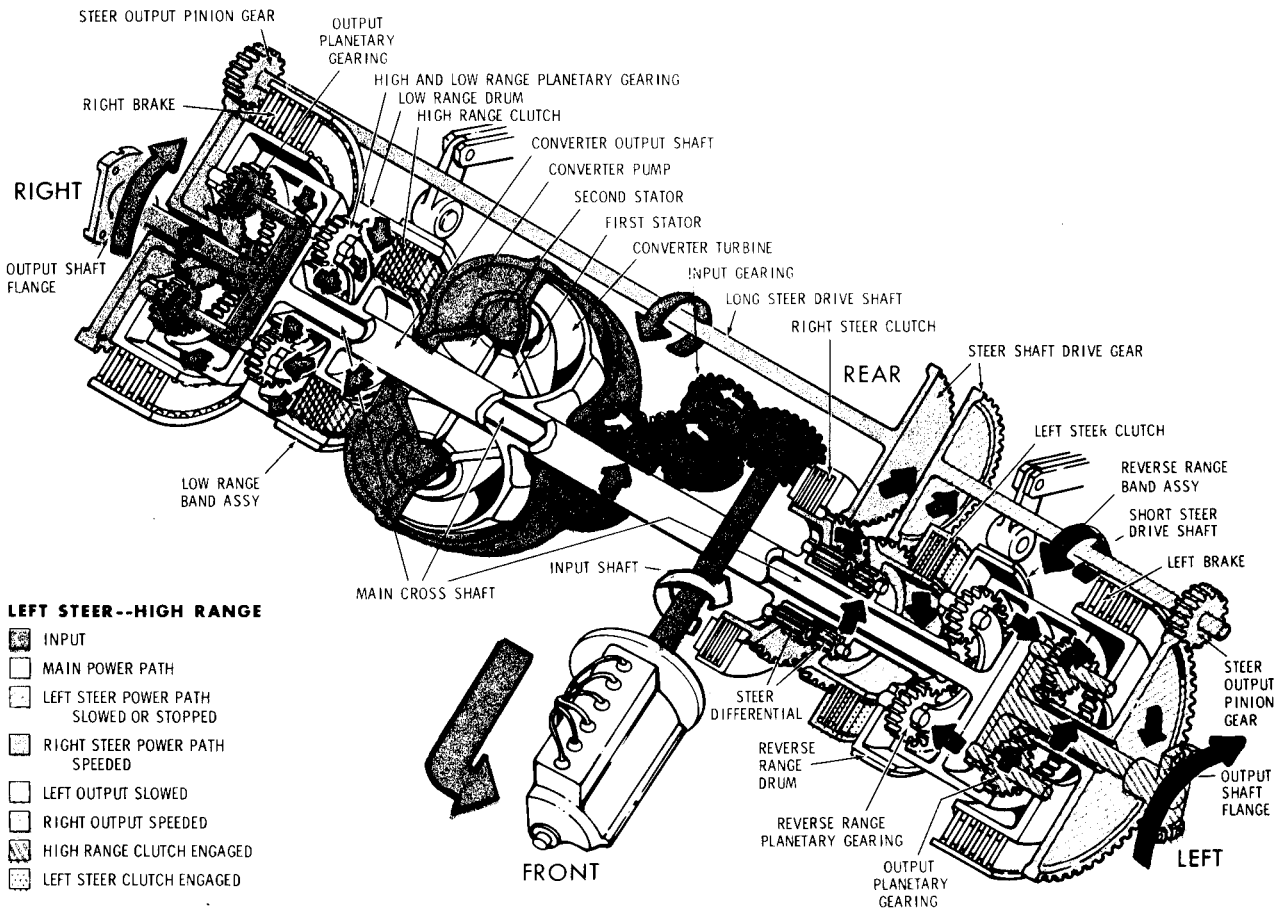
1-42 LEFT-STEER, HIGH-RANGE TORQUE PATH

a. The torque path through the transmission is the same as that described for high-range operation except that the left-steer clutch is applied. Engagement of the left-steer clutch stops the left output sun gear.

b. At the same time, through the action of the differential, the speed of the right output sun gear is doubled. The steering action is identical with that described for low-range, left-steer operation.

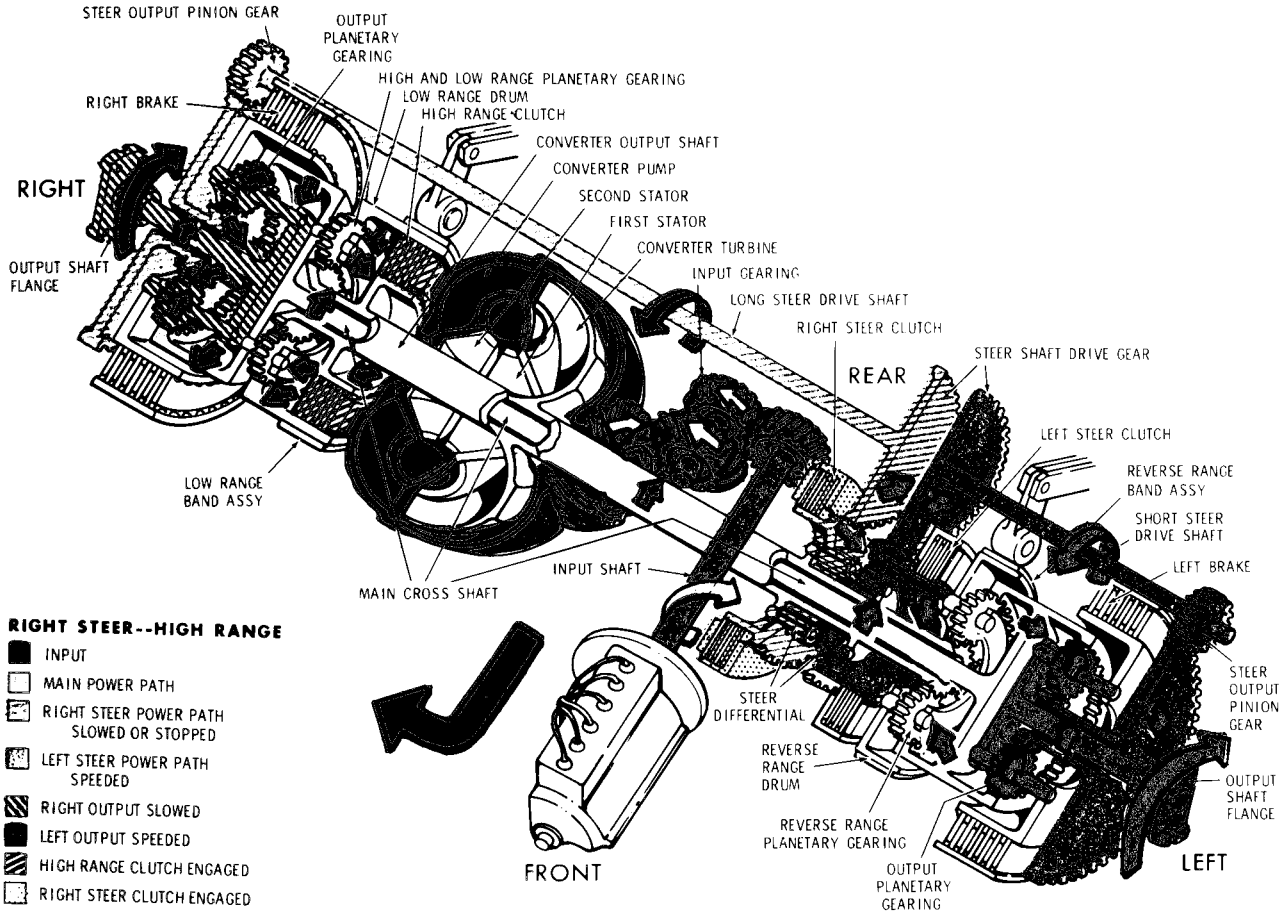


TA236467

1-43 RIGHT-STEER, HIGH-RANGE TORQUE PATH

a. The torque path through the transmission is the same as that described for high-range operation except that the right-steer clutch is applied. Engagement of the right-steer clutch stops the right output sun gear.

b. At the same time, through the action of the differential, the speed of the left output sun gear is doubled. The steering action is identical to that described for low-range, right-steer operation.



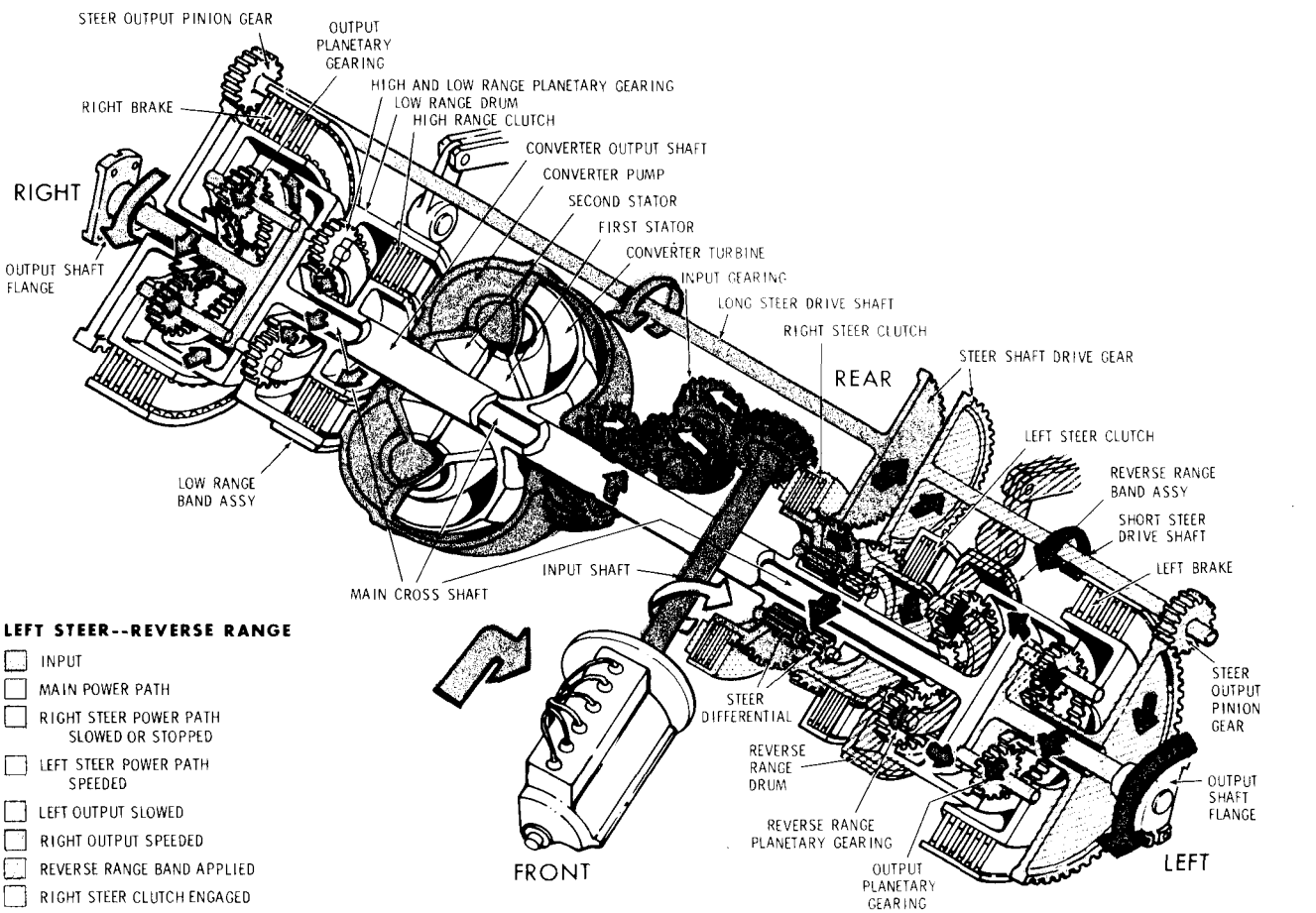
TA236468

1-44 LEFT-STEER, REVERSE-RANGE TORQUE PATH

a. The torque path through the transmission is the same as that described for reverse-range operation. Cross steer results from the way the transmission functions in reverse. Therefore, it is necessary to turn the steering control to the right to obtain left-steer during reverse-range operation.

b. When the steering control is turned toward the right, the right-steer clutch is applied. Engagement of the right-steer clutch stops the counterclockwise (as viewed from right side) rotation of the right output sun gear. The right output ring gear, rotating clockwise, no longer has to offset the counterclockwise rotation of the sun gear. This results in a faster clockwise (reverse) rotation to the right output carrier and attached output flange. At the same time, through the action of the differential, the speed of the left output sun gear is doubled in a counterclockwise (forward) direction. The left output ring gear, being driven at the same speed as the right output ring gear, cannot offset the increased speed of the sun gear. This results in a slower clockwise (reverse) rotation of the left output carrier and attached output flange.

c. The vehicle will steer toward the left because the right output flange rotates faster than the left output flange.



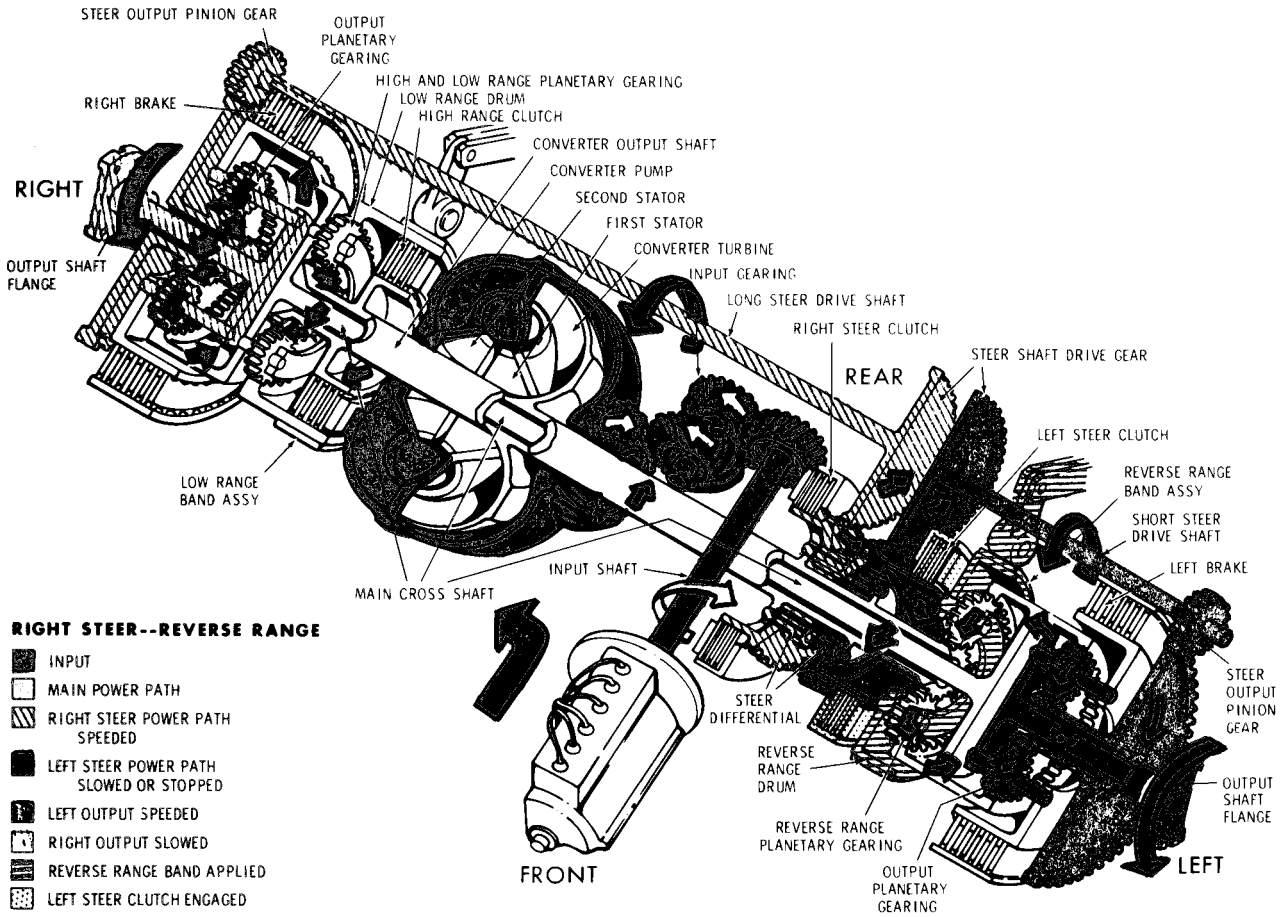
TA236469

1-45 RIGHT-STEER, REVERSE-RANGE TORQUE PATH

a. The torque path through the transmission is the same as that described for reverse-range operation. Cross steer results from the way the transmission functions in reverse. Therefore, it is necessary to turn the steering control to the left to obtain right-steer during reverse-range operation.

b. When the steering control is turned toward the left, the left-steer clutch is applied. Engagement of the left-steer clutch stops the counterclockwise (as viewed from right side) rotation of the left output sun gear. The left output ring gear, rotating clockwise, no longer has to offset the counterclockwise rotation of the sun gear. This results in a faster clockwise (reverse) rotation of the left output carrier and attached output flange. At the same time, through the action of the differential, the speed of the right output sun gear is doubled in a counterclockwise (forward) direction. The right output ring gear, being driven at the same speed as the left output ring gear, cannot offset the increased speed of the sun gear. This results in a slower clockwise (reverse) rotation of the right output carrier and attached output flange.

c. The vehicle will steer toward the right because the left output flange rotates faster than the right output flange.



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CHAPTER 2
TRANSMISSION MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, TEST MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE). AND SUPPORT EQUIPMENT

2-1 OVERVIEW

Parts, tools, and equipment, over and above those authorized for operator and organizational maintenance, are provided to direct and general support activities for maintenance and repair of the model CD 850-6A transmission.

2-2 REPAIR PARTS

Repair parts are listed and illustrated in Appendix B of this manual.

2-3 SPECIAL TOOLS

Special tools are listed and illustrated in Appendix B of this manual.

2-4 COMMON TOOLS

For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) for the maintenance activity.

2-5 TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE)

Testing is accomplished by installing the transmission into the power pack and connecting the power pack to the vehicle with a ground hop kit. For authorized TMDE, refer to the applicable vehicle TM.

2-6 SUPPORT EQUIPMENT

a. A flat work surface capable of supporting 3000 lbs (1362 kg) is required for disassembly/assembly of the transmission.

b. An appropriate end-item vehicle and ground hop kit are required to perform troubleshooting or testing of the transmission removed from an end-item vehicle.

Section II. SERVICE UPON RECEIPT

2-7 OVERVIEW

a. Repairable transmissions received at a Direct or General Support maintenance activity will usually be either packaged in a shipping and storage container or still installed in a deadlined end-item vehicle.

b. Repairable transmissions received in containers should remain packaged until maintenance is scheduled to begin.

c. Removal of a repairable transmission from a deadlined end-item vehicle involves removal of all external connections to the transmission and may even require the removal of the entire powerplant from the vehicle. Refer to the technical manual series for the applicable end-item vehicle for all procedures concerning the actual removal of the transmission from the engine.

TRANSMISSION REMOVAL FROM CONTAINER (Sheet 1 of 2)

TOOLS: 15/16-in. box wrench
5/8-in. box wrench
1-1/2-in. box wrench
1-1/2-in. 3/4-in. drive socket
11/16-in. 1/2-in. drive socket
15/16-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
3/4-in. drive 5-in. long extension
1/2-in. drive breaker bar
3/4-in. drive breaker bar
Hoist, 2-ton minimum capacity

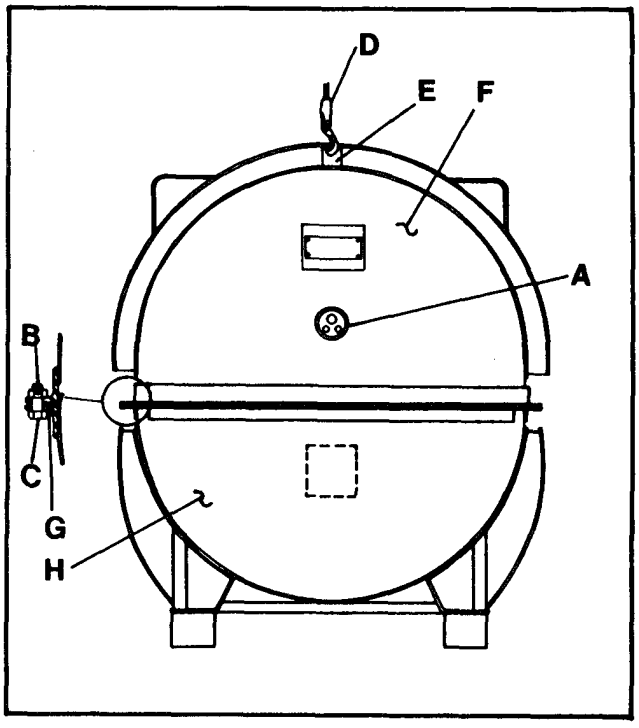
SPECIAL TOOLS: Lifting sling,
P/N 7081593

PERSONNEL: Two persons required

WARNING

The interior of the container is pressurized with compressed air. Serious injury may result if the pressure is not safely relieved by opening air valve (A) before the container is opened.

1. Open air valve (A) to relieve pressure in container.
2. Using 15/16-inch socket, extension, and breaker bar on nuts (B) and 15/16-inch box wrench on bolt heads (C), remove the 30 nuts from the bolts. Remove bolts.
3. Attach lifting sling (D) to hoist and lifting eyes (E) on container top (F).
4. Raise container top (F) with hoist and set aside.
5. Remove splitline gasket (G) from container bottom (H).
6. Inspect gasket (G) for condition. If there are no signs of damage, retain gasket for reuse.



Go on to Sheet 2.

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TRANSMISSION REMOVAL FROM CONTAINER (Sheet 2 of 2)

7. Using 1-1/2-inch socket, extension, and breaker bar on nuts and 1-1/2-inch box wrench on bolt heads, remove two nuts from bolts at locations (J). Remove bolts.

8. Using 15/16-inch socket, extension, and breaker bar on nuts and 15/16-inch box wrench on bolt heads, remove two nuts from bolts at locations (K) which attach side bracket (L) to lower section of container.

9. Attach lifting sling to hoist and transmission end cover lifting eyes and raise transmission out of container.

NOTE

Side bracket (L) comes out with transmission.

10. Using 11/16-inch socket, extension, and breaker bar on nuts and 5/8-inch box wrench on bolt heads, remove eight nuts and washers from bolts that attach bracket (L) to transmission.

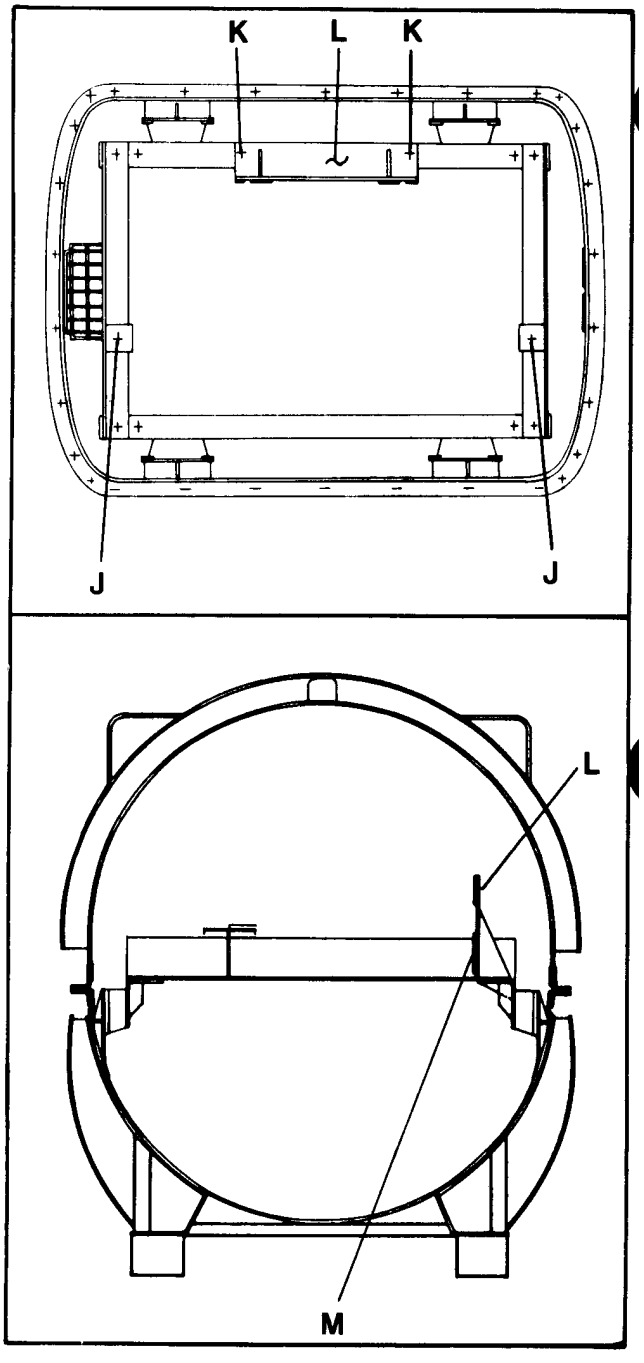
11. Remove eight bolts, side bracket (L), and transmission mounting flange gasket (M).

12. Keep gasket (M), bracket (L), bolts, washers, and nuts with container for reuse.

NOTE

Inspection of the transmission and associated records at this time will determine the next actions to be taken. If transmission is to go directly into disassembly, go to page 2-24. If transmission is to be tested or adjusted, go to page 4-1.

END OF TASK



Section III. TROUBLESHOOTING

2-8 OVERVIEW

a. Troubleshooting is a logical, systematic search for the cause(s) of malfunction(s). Director General Support troubleshooting of a CD 850-6A transmission may be performed with the transmission installed in an end-item vehicle or with the powerplant connected to the end-item vehicle with a ground hop kit.

NOTE

When troubleshooting is performed with the transmission in a vehicle, the information in this manual shall be used in conjunction with the information in the technical manual series for the applicable end-item vehicle.

b. The purpose of troubleshooting is to establish the nature and extent of repair required to return the transmission to serviceable condition. Thorough troubleshooting before the transmission is removed from the powerplant may reveal malfunctions external to the transmission. Corrections of such external malfunctions may prevent the unnecessary effort of removing the transmission.

c. Troubleshooting in a Direct or General Support shop may be necessary to verify the diagnosis made before the transmission was removed. Such troubleshooting may be the only means of uncovering the true extent of defects in a transmission received in an unserviceable condition from another activity.

d. Troubleshooting may be necessary to determine the cause when a repaired transmission fails to meet final tests.

2-9 IN-VEHICLE TROUBLESHOOTING

CAUTION

Maintenance personnel must have a thorough knowledge of vehicle operation before attempting to troubleshoot an installed transmission. The purpose and use of all operator controls must be thoroughly understood. Refer to the technical manual series for the applicable end-item vehicle.

a. Prerequisites. Maintenance personnel must have a working knowledge of how the transmission is constructed and how it should perform before starting to troubleshoot. The operational and functional descriptions of the transmission and its major components provided in Chapter 1 of this manual should be thoroughly understood.

CAUTION

Do not attempt operational troubleshooting of a transmission that may have malfunctions that may cause further damage if operated. Thoroughly inspect for visible deficiencies and proceed carefully with operational checks only after it is determined there is little chance of causing further damage.

b. Preliminary Inspections

(1) Control Linkage. Inspect steer, shift, and brake linkages for condition, freedom of operation, adjustment, and proper movement. Refer to technical manual series for the applicable end-item vehicle.

(2) Oil Leaks. Visually inspect splitlines, oil lines, oil cooler, plugs, and seals for oil leaks. Tighten fittings or replace seals and gaskets, as necessary, to stop leaks. Replace lines, fittings, or other components as necessary. Refer to technical manual series for the applicable end-item vehicle.

(3) Oil Cooler. Inspect the oil cooler for mud, leaves, or other debris that might hinder air circulation. Check for proper operation of cooling fans. Refer to technical manual series for the applicable end-item vehicle.

(4) Brakes, Range Bands. Check brakes for proper adjustment per Chapter 4. Check low- and reverse-range bands for proper adjustment per Chapter 4.

CAUTION

Do not start the vehicle engine before the oil in the transmission is checked and filled to the proper level.

(5) Oil Level. Check oil level to be sure there is sufficient oil for proper operation.

(6) Oil Filter. Check for debris, condition of oil, and evidence of internal failure.

c. Operational Checks

(1) Engine Performance. It is essential that the vehicle engine is performing properly to effectively troubleshoot the transmission. Loss of power or speed due to engine deficiencies must not be interpreted as transmission malfunctions. Refer to the technical manual series for the applicable end-item vehicle.

(2) Transmission Oil Pressures. Check all transmission oil pressures for conformance to normal values per Chapter 4.

CAUTION

If potentially hazardous conditions that might cause further damage to the transmission are encountered during performance checks, stop checks immediately. Remove transmission from vehicle for further inspection.

(3) Performance Checks. Operate the vehicle carefully through all ranges, steer conditions, starts, and stops at various speed and load conditions. Refer to technical manual series for applicable end-item vehicle. Note all unusual noises, odors, vibration, shock, overheating, response to controls, and instrument recordings during operation.

2-10 SHOP TROUBLESHOOTING

a. Inspections. Shop inspections permit access to some areas not visible while the transmission is installed in the end-item vehicle. Visual inspections may detect malfunctions not found during in-vehicle troubleshooting. If the transmission was received from some other maintenance activity, an analysis of the diagnosis provided on the repairable parts tag or transmission records may indicate the appropriate repair action without further troubleshooting.

b. Ground Hop Kit. Troubleshooting of the transmission using a ground hop kit may be the only way to make a final determination of its condition and the repair action required (refer to Chapter 4). The same troubleshooting procedures can be applied to a repairable transmission when its condition is unknown or to a repaired transmission that fails final tests.

2-11 TROUBLESHOOTING TABLE

a. Troubleshooting procedures are provided in Table 2-1. The most likely malfunction symptoms to be encountered have been listed, followed by tests and inspections to determine the probable cause and the recommended corrective action.

b. The troubleshooting table has been prepared for use with the transmission installed in an end-item vehicle, but can be used just as well when the powerplant is connected to the end-item vehicle using a ground hop kit.

c. To use the Table, first find the malfunction symptom that best describes the actual condition. Perform the tests and inspections to determine the probable cause and make the corrections indicated. If no cause is found or corrective action does not resolve the problem, proceed to the malfunction symptom that next best describes the condition.

Table 2-1. Troubleshooting

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

CAUTION

Always check oil level, condition of oil and oil filter before operating. Do not operate transmission with low oil pressure. In addition to the possibility of causing extensive damage, operation with low oil pressure will cause erratic performance. This erratic performance may be mistaken for many other types of malfunctions if troubleshooting is attempted with low oil pressure.

1. Main oil pressure is low.

Step 1. Check for low oil level.
Fill to proper level.

Step 2. Check for excessive leakage in external oil lines and/or oil cooler.
Repair or replace as necessary (refer to technical manual series for applicable end-item vehicle).

Step 3. Check for failed oil pressure gage or interconnecting circuit.
Repair or replace components, as necessary (refer to technical manual series for applicable end-item vehicle).

Step 4. Check for defective oil input pump.
Replace oil input pump (pages 2-50 or 2-51 and 2-53 and 2-54).

Step 5. Check for defective main-pressure regulator valve.
Repair or replace valve (pages 3-110 and 3-117).

Step 6. Check for excessive internal oil leakage.
Repair or overhaul defective internal components.

Step 7. Check for failed or missing input shaft.
Replace shaft (pages 2-25 and 2-79).

2. Vehicle will not travel in any range.

Step 1. Check for failed or disconnected vehicle final drive.
Repair and/or reconnect vehicle final drive (refer to technical manual series for applicable end-item vehicle).

Step 2. Check for low oil pressure.
Refer to malfunction #1 above.

Table 2-1. Troubleshooting (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
Step 3.	Check for failed or missing input shaft. Replace input shaft (pages 2-25 and 2-79).
Step 4.	Check for broken or disconnected shift control linkage. Repair and/or reconnect shift control linkage (refer to technical manual series for applicable end-item vehicle).
Step 5.	Check for failed or locked brakes. a. Repair or replace brake assemblies (pages 3-5 through 3-30). b. Free or adjust brakes (page 4-5).
Step 6.	Check for failed internal transmission components. Repair or overhaul transmission, as necessary.
3. Vehicle will not travel in low-range.	
Step 1.	Check for binding or improperly adjusted shift linkage. Free or adjust shift linkage (refer to technical manual series for applicable end-item vehicle).
Step 2.	Check for defective control valve body assembly. Replace control valve body assembly (pages 2-30 and 2-78).
Step 3.	Check low-range band for failure or imporper adjustment. a. Repair or replace low-range band (pages 2-45 and 2-62). b. Adjust low-range band (page 4-3).
4. Vehicle will not travel in high-range.	
Step 1.	Check for binding or improperly adjusted shift linkage. Free or adjust shift linkage (refer to technical manual series for applicable end-item vehicle).
Step 2.	Check for defective control valve body assembly. Replace control valve body assembly (pages 2-30 and 2-78).
Step 3.	Check for high-range clutch failure. Repair or replace high-range clutch (pages 2-43 and 2-64).
5. Vehicle will not travel in reverse.	
Step 1.	Check for binding or improperly adjusted shift linkage. Free of adjust shift linkage (refer to technical manual series for applicable end-item vehicle).

Table 2-1. Troubleshooting (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
Step 2.	Check for defective control valve body assembly. Replace control valve body assembly (pages 2-30 and 2-78).
Step 3.	Check reverse band for failure or improper adjustemnt. a. Repair or replace reverse band (pages 2-40 and 2-67). b. Adjust reverse band (page 4-3).
6. Vehicle will not steer right or left.	
Step 1.	Check for failed or disconnected steer control linkage. Repair, replace or reconnect steer control linkage (refer to technical manual series for applicable end-item vehicle).
Step 2.	Check for defective control valve body assembly. Replace control valve body assembly (pages 2-30 and 2-78).
Step 3.	Check for failed steer differential. Repair or replace steer differential (pages 3-66 and 3-89).
7. Vehicle will steer only right or left.	
Step 1.	Check for binding or improperly adjusted steer and shift control linkage. Free or adjust steer and shift control linkage (refer to technical manual series for applicable end-item vehicle).
Step 2.	Check for defective control valve body assembly. Replace control valve body assembly (pages 2-30 and 2-78).
Step 3.	Check for leaking steer clutch piston seals. Replace steer clutch piston seals (pages 3-61, 3-64, 3-86, and 3-91).
Step 4.	Check for failed steer clutch plates. Replace steer clutch (pages 3-60 and 3-95).
8. Vehicle steers right or left with no steer control applied.	
Step 1.	Check for a binding or improperly tensioned track. Free or adjust track (refer to technical manual series for applicable end-item vehicle).
Step 2.	Check for improperly adjusted steer linkage. Adjust steer linkage (refer to technical manual series for applicable end-item vehicle).

Table 2-1. Troubleshooting (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
Step 3.	Check for failed steer clutch (won't release). Repair or replace steer clutch (pages 3-60 and 3-95).
Step 4.	Check for failed vehicle final drive. Repair vehicle final drive (refer to technical manual series for applicable end-item vehicle).
Step 5.	Check for failed or improperly adjusted brake(s). Repair or adjust brake(s) (page 4-5).
Step 6.	Check for defective control valve body assembly. Replace control valve body assembly (pages 2-30 and 2-78).
9. Vehicle does not stop properly or pulls left or right when brakes are applied.	
Step 1.	Check brake linkage for binding or improper adjustment. Free or adjust brake linkage (page 4-5).
Step 2.	Check for failed brake plates. Repair or replace brake plates (pages 3-11 and 3-24).
10. Lubricating oil presure light comes on.	
Step 1.	Check for low oil pressure. Refer to malfunction #1 above.
Step 2.	Check for low oil level. Fill to proper level.
Step 3.	Check for electrical circuit failure. Repair electrical systems, as necessary (refer to technical manual series for applicable end-item vehicle).
Step 4.	Check for air flow restrictions in oil cooler. Clear dirt and debris from oil cooler (refer to technical manual series for applicable end-item vehicle).
Step 5.	Check for failure of oil cooler fan(s). Repair or replace fan(s) (refer to technical manual or applicable end-item vehicle).
Step 6.	Check for defective lubrication pressure regulator valve. Repair or replace lubrication pressure regulator valve (pages 3-34 and 3-38).

Table 2-1. Troubleshooting (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
Step 7.	Check for dragging brakes. Adjust brakes (page 4-5).
Step 8.	Check for excessive internal leakage. Repair or replace internal components, as necessary.
Step 9.	Check for defective torque converter assembly. Repair or replace torque converter assembly (pages 3-51 thru 3-57 and pages 3-96 thru 3-108).
11. Converter oil high-temperature warning light comes on.	
	NOTE If the oil high-temperature warning light comes on during high-range operation under severe load conditions, shift to low range.
Step 1.	Check for low oil pressure. Refer to malfunction #1 above.
Step 2.	Check for low oil level. Fill to proper level.
Step 3.	Check for defective electrical circuit. Repair electrical circuit (refer to technical manual series for applicable end-item vehicle).
Step 4.	Check for air fiow restrictions in oil cooler. Clean dirt and debris from oil cooler (refer to technical manual series for applicable end-item vehicle).
Step 5.	Check for failed oil cooler fan(s). Repair or replace oil cooler fan(s) (refer to technical manual series for applicable end-item vehicle).
Step 6.	Check for restricted oil flow through oil cooler. Clear oil flow restrictions (refer to technical manual series for applicable end-item vehicle).
12. Operation normal in high range, but stalls in low and reverse range.	
Step 1.	Check for failed high-range clutch. Repair or replace high-range clutch (pages 2-42 and 2-64).

Table 2-1. Troubleshooting (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
13. Operation normal in low-range, but stalls in high- and reverse-range.
Step 1. Check low-range band for too tight adjustment. Adjust low-range band (page 4-3).
14. Operation normal in reverse, but stalls in low- and high-range.
Step 1. Check reverse band for too tight adjustment. Adjust reverse band (page 4-3).
15. Engine stall speed too high.
Step 1. Check for low oil pressure. Refer to malfunction #1 above.
Step 2. Check for low oil level. Fill to proper level.
Step 3. Check for binding or improperly adjusted shift control and/or brake linkage. Free or adjust shift control and/or brake linkage (refer to technical manual series for applicable end-item vehicle).
Step 4. Check range bands for too loose adjustment. Adjust range bands (page 4-3).
Step 5. Check brakes for too loose adjustment. Adjust brakes (page 4-5).
16. Engine stall speed too low.
Step 1. Check for improper engine operation. Adjust engine (refer to technical manual series for applicable end-item vehicle).

Section IV. GENERAL MAINTENANCE PRACTICES

2-12 OVERVIEW

This section explains the general maintenance practices that should be followed by Direct or General Support maintenance activities in the repair of the CD 850-6A transmission. Particular emphasis has been placed on:

a. Tools and Equipment
b. Mandatory Replacement Parts
c. Care in Handling
d. Importance of Cleanliness
e. Exterior Surface Cleaning
f. Subassembly Cleaning
g. Cleaning Procedure Deviations
h. Inspection and Repair Recommendations
i. Lubrication
j. Repair Standards

2-13 OIL ANALYSIS PROGRAM

Refer to the appropriate lube order for oil changes and to TB 43-0210 (Army Oil Analysis Program) and TB 43-0211 (Oil Analysis Program User's Guide) for oil sampling procedures concerning this transmission.

2-14 TOOLS AND EQUIPMENT

All required tools and equipment must be available within the maintenance shop before repair of a transmission is started. The use of improper tools and/or equipment may damage component parts and may result in unsatisfactory performance or failure of the transmission after repairs are completed.

2-15 MANDATORY REPLACEMENT PARTS

Certain items, such as gaskets, preformed packings, oil seals, cotter pins, and lockwire may be deformed during use and are very often damaged or destroyed during removal. Such items should be discarded as they are removed during disassembly. New, replacement items must be used for reassembly.

2-16 CARE IN HANDLING

During maintenance operations, parts and subassemblies must be handled carefully to prevent nicking, scratching, or denting. Parts which operate within very close tolerances will not function properly if even slightly damaged. Parts which depend on smooth sealing surfaces may leak if scratched. Such parts should be carefully handled and protected. Use suitable containers and parts receptacles for storage. Protect all threads, splines, and pilot diameters. Any protective covers used must be of such configuration as to prevent subsequent assembly without first removing the covers.

2-17 IMPORTANCE OF CLEANLINESS

a. All parts must be thoroughly cleaned in accordance with TM 9-208-1 and kept clean during any maintenance procedure. Cleanliness is of utmost importance during all maintenance actions. Handle parts carefully during cleaning operations.

WARNING

Most cleaning solvents burn easily and give off explosive vapors. DO NOT USE solvents near an open flame. Always use in a well ventilated area. Explosion, resulting in death or serious injury, can occur if explosive vapors are ignited.

CAUTION

Lint or dirt in the interior of a transmission can cause malfunction(s). Rags used for cleaning external surfaces must not be used when working with internal parts and surfaces. Only clean lint-free rags can be used on internal parts and surfaces.

b. Dirt or foreign matter can cause excessive wear and possible premature failure of bearings and gears as well as sticky valves.

c. Each component part must be thoroughly cleaned after disassembly to permit effective inspection.

CAUTION

Protective covers must be designed and used in such a way that reassembly cannot be accomplished without their removal.

d. All holes, cavities, and oil passage ports exposed by disassembly must be covered to prevent the entry of foreign matter. Foreign matter trapped in such areas may cause malfunctions or possible failure of the transmission after reassembly.

WARNING

Air under pressure is used in the maintenance of the transmission. Operating personnel and those in the immediate area should observe safety precautions. Serious Injury may result when compressed air comes in contact with the skin or causes flying metal chips.

e. When metal particle contamination is found, clean ALL parts by flushing with solvent. Blow parts dry with compressed air. Also blow compressed air into all pockets, cavities, and passages to get rid of trapped metal particles.

2-18 EXTERIOR SURFACE CLEANING

a. The exterior surfaces of the transmission should be thoroughly cleaned before disassembly is started.

CAUTION

Steam cleaning should only be done immediately before disassembly so that condensed water can be removed.

b. To clean an excessively dirty transmission, prepare an alkaline steam cleaning solution consisting of 10 pounds of trisodium phosphate (item 25, Appendix C) for each 50 gallons (189 liters) of water. Apply this solution with forced steam pressure at 50 psi (345 kPa).

c. To clean a slightly dirty transmission, wash with cleaning solvent (item 20, Appendix C) and blow dry with compressed air.

2-19 SUBASSEMBLY CLEANING

CAUTION

Many different materials are used in the manufacture of the various component parts within the transmission. The chemical properties of some cleaning agents are not necessarily compatible with all materials within some subassemblies. Be sure the cleaning agent used will not damage any of the component parts.

a. Housings, Castings, and Forgings

WARNING

Use extreme care when using varnish remover. Avoid contact of solution with eyes or skin. Contact with skin can cause a rash or blisters; scrub with soap and water. Contact with eyes can cause blindness; flush with clear water and get medical attention immediately.

Denatured alcohol is highly poisonous if taken internally. Drinking denatured alcohol can cause blindness or death. Get medical attention immediately if taken internally.

CAUTION

Never use a scraper that might scratch or score metal surfaces.

(1) Remove sealant or gasket fragments by soaking the affected areas with denatured alcohol (item 23, Appendix C). When material has softened, remove it with a stiff-bristle brush or scraper. Select a scraper that will not scratch or score the metal surface. Flush the area with solvent and blow dry with compressed air.

(2) To tremove oil, grease, or sludge, wash the part with dry cleaning solvent (item 20, Appendix C). Use a stiff-bristle brush or a soft wire (brass or copper) to loosen particles lodged in cavities or oil passages. Thoroughly flush with clean solvent and blow dry with compressed air.

b. Gears and Shafts. Wash parts with cleaning solvent (item 20, Appendix C) and blow dry with compressed air.

c. Clutch Plates. Soak plates in varnish remover (item 28, Appendix C). Remove the part, thoroughly pressure-rinse with hot water, and blow dry with compressed air.

d. Filter Screen Assemblies. Thoroughly clean with a stiff-bristle brush and cleaning solvent (item 20, Appendix C) and blow dry with compressed air.

e. Antifriction Bearings

WARNING

Never dry bearings by spinning them with compressed air. A spinning bearing can disintegrate, allowing balls or rollers to become lethal flying projectiles. Also, spinning bearings while they are not lubricated can damage them.

CAUTION

Refer to TM 9-214 for more information on the proper cleaning and handling of bearings.

For separable bearings, establish a way to keep the inner and outer races of the same bearing together during cleaning and inspection.

(1) Immerse bearing in cleaning solvent (item 20, Appendix C) and agitate, then blow dry with compressed air.

(2) After cleaning, gently rotate bearing by hand to check for evidence of grit. If there is evidence of grit, repeat the cleaning operation until it is all removed.

(3) Lubricate bearings with transmission oil (item, 4, Appendix C) immediately after cleaning.

f. Spool Valves

CAUTION

Use extreme care in handling spool valves. Mishandling of valves or component parts of valves may result in future malfunctions

(1) Wash spool valves in cleaning solvent (item 20, Appendix C) and blow dry with compressed air.

(2) If varnish deposits are present, soak in varnish remover (item 28, Appendix C). Thoroughly pressure-rinse with hot water and blow dry with compressed air.

2-20 CLEANING PROCEDURE DEVIATIONS

The cleaning procedures described in the preceding paragraphs are those recommended by the manufacturer. Deviations from these procedures are permissible if:

a. Acceptable shop practices are used.

b. Integrity of the part is not impaired (function, durability, strength, finish, etc.).

c. Wear limits and dimensional requirements are maintained.

2-21 INSPECTION AND REPAIR RECOMMENDATIONS

a. Inspection

(1) All parts which are to be reassembled into the transmission should be inspected.

(2) When the transmission is partially disassembled for repair, metal particle contamination of the interior parts and oil system may be discovered. When this condition is found and it is determined that repair can make the transmission serviceable, the transmission must be completely disassembled and all parts must be cleaned and inspected.

b. Repair, Replacement

(1) The repair and replacement methods presented herein are for the most frequently encountered defects. Most minor defects can easily be corrected, using basic skills and tools. Parts requiring extensive repair operations should be replaced.

(2) The most frequently encountered defects can be detected and remedied, using the inspection criteria and repair methods described in paragraph c, below.

c. Inspection and Repair Procedures

(1) Castings, Forgings, and Machined Surfaces

(a) Inspect all castings and forgings for breaks, cracks, wear, or scoring that would impair serviceability. Remove nicks and small surface irregularities with crocus cloth or a soft honing stone. Replace any castings or forgings that are cracked or broken.

(b) Inspect all oil passages for obstructions or dirt. Reclean the passage if necessary.

(c) Inspect all mounting faces for nicks, scratches, or scores. Remove minor defects with crocus cloth or a soft honing stone. Replace any parts in which defects that cannot be corrected would impair the operation of the transmission.

(d) Inspect threaded holes for damaged threads. Chase damaged threads with correct size tap.

(e) Inspect studs for damaged threads or looseness. Replace defective studs. If stud is loose or has backed out, replace with the next larger size stud. One line on end of stud indicates 0.003-inch oversize, two lines indicate 0.006-inch oversize, three lines indicate 0.009-inch oversize, and four lines indicate 0.012-inch oversize.

A stud with no lines on the end is a standard-size stud. Before replacing studs, apply lubricating oil to the threads. When a stud is properly installed, it should extend from the housing the same distance as adjacent studs that are of equal length. The amount of torque used to tighten studs must fall within the following limits:

1/4-20 thread -5 to 11 lb-ft (7 to 15 N.m)

5/16-20 thread -7 to 22 lb-ft (9.5 to 30 N.m)

5/8-16 thread -10 to 37 lb-ft (13.5 to 50 N.m)

1/2-13 thread -15 to 65 lb-ft (20 to 86 N.m)

(f) Inspect dowel pins for damage and wear. Replace defective dowel pins. If dowel pin to be removed is in a blind hole, drill and tap the dowel for removal. Obtain a sleeve which will extend about an inch above the top of the dowel when the sleeve is placed over the dowel. The sleeve must have square ends and the inside diameter of the sleeve must be slightly larger than the outside diameter of the dowel pin. Place the sleeve over the dowel to be removed and install a washer on the sleeve. Using a bolt and nut the same size as the threaded hole in the dowel, install the nut on the bolt, and thread the bolt into the dowel pin. Hold the bolt, and turn the nut against the washer to remove the dowel.

(2) Roller or Ball Bearings. Refer to TM 9-214 for inspection procedures.

(3) Needle Bearings. Inspect the bearings for free and smooth rotation, broken or missing rollers, and tightness of fit in bore. If defects are found, replace the bearing, using needle bearing replacer with handle for installation and slide hammer bearing puller for removal.

(4) Bushings, Sleeve-Type Bearings, and Thrust Washers

(a) Inspect bushings and bushing-type bearings for size, scoring, out-of-roundness, burrs, sharp edges, and evidence of seizing. Minor scores, sharp edges and scratches may be removed with crocus cloth. Out-of-round, deeply scored, or worn parts should be discarded.

CAUTION

If necessary to cut a bushing to remove it, be extremely careful to not damage the bore into which it fits.

NOTE

Do not remove bushings and bushing-type bearings unless replacement is necessary. Removal usually damages these parts.

(b) Remove bushings and bushing-type bearings by using a puller or press when possible. Bushings in blind holes may require removal by sawing or the use of a narrow cape chisel.

(c) Check thrust washers for distortion, scores, and burrs. Remove burrs with whetstone. Replace washers that are scored or distorted.

(5) Oil Seals, Preformed Packings, and Gaskets

(a) Inspect hook-type seal rings for wear, distortion, and broken hooks. Replace defective seal rings.

(b) Inspect lip-type seal rings for cracks, brittleness, cuts, or wear. Inspect springs and seal shells. Replace any seal found defective.

(c) Replace all gaskets, preformed packings, and O-rings.

(6) Gears

(a) Inspect gears for burrs, wear, broken teeth, and pitting at tooth contact areas.

(b) Remove burrs with a whetstone. Replace gears that are excessively worn or pitted.

(7) Splined Parts

(a) Inspect splined parts for twisted or broken splines, burrs, or excessive wear.

(b) Remove burrs with a whetstone. Replace parts which have twisted or broken splines or excessive wear.

(8) Clutch Disks

(a) Check friction-faced, internal-splined, clutch disks for burrs, severely pitted faces, cracks, distortion, and damaged spline teeth. Remove burrs with whetstone. Replace disks that are severely pitted, cracked, distorted, or have damaged spline teeth.

(b) Check steel, external-tanged, clutch disks or plates for burrs, scoring, distortion, imbedded metal, galling, cracks, breaks, and battered tangs. Remove burrs and minor surface irregularities with whetstone or crocus cloth. Replace disks that are scored, distorted, galled, cracked, broken, or have imbedded metal, or battered tangs.

(9) Threaded Parts

(a) Inspect all threaded parts for stripped or damaged threads and burrs.

(b) Replace all parts which have stripped threads or damage which cannot be repaired by chasing the threads with a tap or die of the proper size, or by installing threaded inserts.

(c) Application of nonhardening sealer (item 30, Appendix C) is permissible on all pipe threads unless otherwise specified.

(10) Retaining Rings. Check retaining rings for nicks, burrs, or distortion. Remove nicks and burrs with whetstone. If ring is distorted, replace it.

(11) Springs. Check springs for wear, breaks, or evidence of overheating (discolored). If any of these defects are found, replace spring.

(12) Shafts and Spindles

(a) Inspect shafts and spindles for excessive wear, bending, scores, cracks, burrs, and obstructed oil passages.

(b) Remove burrs and minor surface irregularities with crocus cloth or a soft honing stone. Remove obstructions by probing with soft wire (copper or brass) or by blowing with compressed air. Replace parts with other defects.

(13) Ball-Type Valves

(a) Inspect steel balls for rust, pitting, or grooving. Replace balls which will not seat properly.

(b) Inspect ball seats for wear and pitting. Reseat by lapping with the proper size ball. Replace parts in which the seats cannot be restored.

(14) Spool-Type Valves

(a) Inspect valves for wear, burrs, scoring, and evidence of sticking. Try valves in their bores. All valves should move freely in their bores by their weight alone. Do not force valves.

(b) Inspect the edges of all valve lands. All edges should be square and sharp. Do not destroy these sharp edges in cleaning or repair operations. These sharp edges help prevent the accumulation of substances which might cause the valve to stick in its bore.

(c) Remove burrs with a soft honing stone. Reclean valves, if necessary, to remove gum and dirt. Replace all valves which have other defects.

(15) Sheet Metal Parts. Inspect sheet metal parts for bends, cracks, distortion, interference with adjacent parts, and failed weld joints. Straighten bent parts. Weld cracks or failed welds.

2-22 LUBRICATION

a. During repair and assembly tasks, make sure all moving parts are well oiled. This oil will protect the parts during the first few moments after engine start up.

b. Put lubricating oil (item 4, Appendix C) on all moving parts such as gears, shafts, valves, and bearings. Also put oil on surfaces in valve bodies and housings that mate with moving parts. Put oil on all preformed packings, O-rings, seals, and seal rings. Put oil on with hand oiler, or dip part in a clean container filled with lubricating oil. Soak clutch plates for two minutes in lubricating oil before installation.

c. Put high-temperature grease (item 14, Appendix C) on inside of each encased plain seal.

d. Use petrolatum (item 13, Appendix C) when necessary to hold gaskets or parts in place during assembly. Also use petrolatum to hold step-joint seal rings and metal seal rings in their grooves during assembly.

2-23 REPAIR STANDARDS

a. Torque Specifications. All nuts, bolts, and screws used in the transmission are torqued to a value in either pound-feet or pound-inches. Refer to the applicable assembly paragraphs for the torque value.

CAUTION

Following the figures for pound-feet is another set of figures in parentheses - example (49 to 58 N.m). Do not use the figures in parentheses unless the torque wrench is marked for Newton meters. If the wrong torque values are used, leaks, cracked housings, or faulty operation can occur.

NOTE

All threaded parts should be lightly smeared with oil (item 4, Appendix C) before assembly.

b. Bolt Tightening Sequence. On bolt circles, alternately tighten nuts, bolts, or screws that are 180 degrees apart to half of minimum torque. Repeat the process, tightening to the specified torque.

SECTION V. TRANSMISSION DISASSEMBLY INTO MAJOR COMPONENTS

2-25 OVERVIEW

a. This section provides maintenance instructions for shop disassembly of the transmission into major components.

b. Section VI of this Chapter provides maintenance instructions for shop assembly of the transmission from major components.

c. Maintenance instructions for shop disassembly, repair, and assembly of major components are provided in Chapter 3.

d. The transmission will normally be disassembled only as far as is necessary to make a particular repair.

DRAIN OIL, DISCONNECT AND REMOVE STRAIGHT SHAFT (INPUT SHAFT), REMOVE OIL INPUT PUMP DRIVE GEAR, AND POSITION TRANSMISSION ON WORK SURFACE (Sheet 1 of 2)

TOOLS: 1/2-in. drive breaker bar
1/2-in. drive torque wrench
Hoist, 2-ton minimum capacity
1-1/16-in. 1/2-in. drive socket
Internal retaining ring pliers
Machinistts hammer
3/4-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
Pry bar
3/32-in. punch

SPECIAL TOOLS: Lifting sling, P/N 7081593

SUPPLIES: Wood blocks of various sizes
Two suitable containers

NOTE
The transmission contains about 90 quarts (85 liters) of transmission oil.

PERSONNEL: Two persons recommended

Preliminary PROCEDURE: Transmission has been removed either from power plant (refer to applicable vehicle TM) or from shipping container (page 2-3).

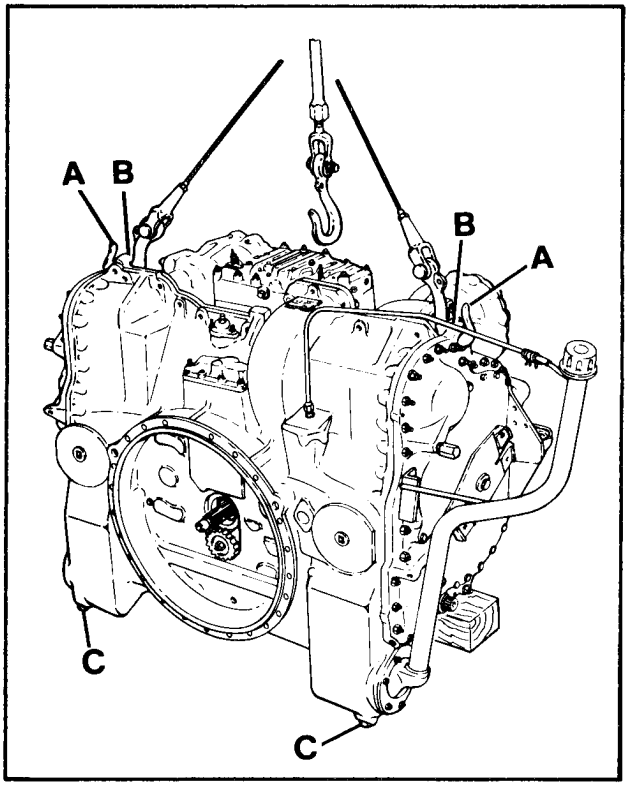
NOTE
The exterior surfaces of the transmission should be clean (page 2-16).

1. Attach lifting sling to hoist and attach two lifting sling hooks (A) to transmission end cover lifting eyes (B). (The third hook is not used.) Suspend the transmission so that there is room to place the containers underneath it.

2. Place suitable containers under each end of transmission.

3. Using breaker bar, remove two pipe plugs (drain plugs) (C) and allow all oil to drain.

4. Replace drain plugs (C) and lightly tighten. Using torque wrench tighten drain plugs to 35 to 55 lb-ft (48 to 75 N·m).



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Go on to Sheet 2.

DRAIN OIL, DISCONNECT AND REMOVE STRAIGHT SHAFT (INPUT SHAFT), REMOVE OIL INPUT PUMP DRIVE GEAR, AND POSITION TRANSMISSION ON WORK SURFACE (Sheet 2 of 2)

5. Using 1-1/16-inch socket and breaker bar, remove threaded, machine plug (input shaft plug) (D) and gasket (E).

NOTE

Do step 6 only if retaining ring (F) is in place in housing at rear of input shaft.

6. Using internal retaining ring pliers, remove retaining ring (F) from rear of housing.

NOTE

Input shaft (G) should easily pull out of spline in input drive gear by hand. If splines bind, tap on back end of input shaft (G) with handle of hammer.

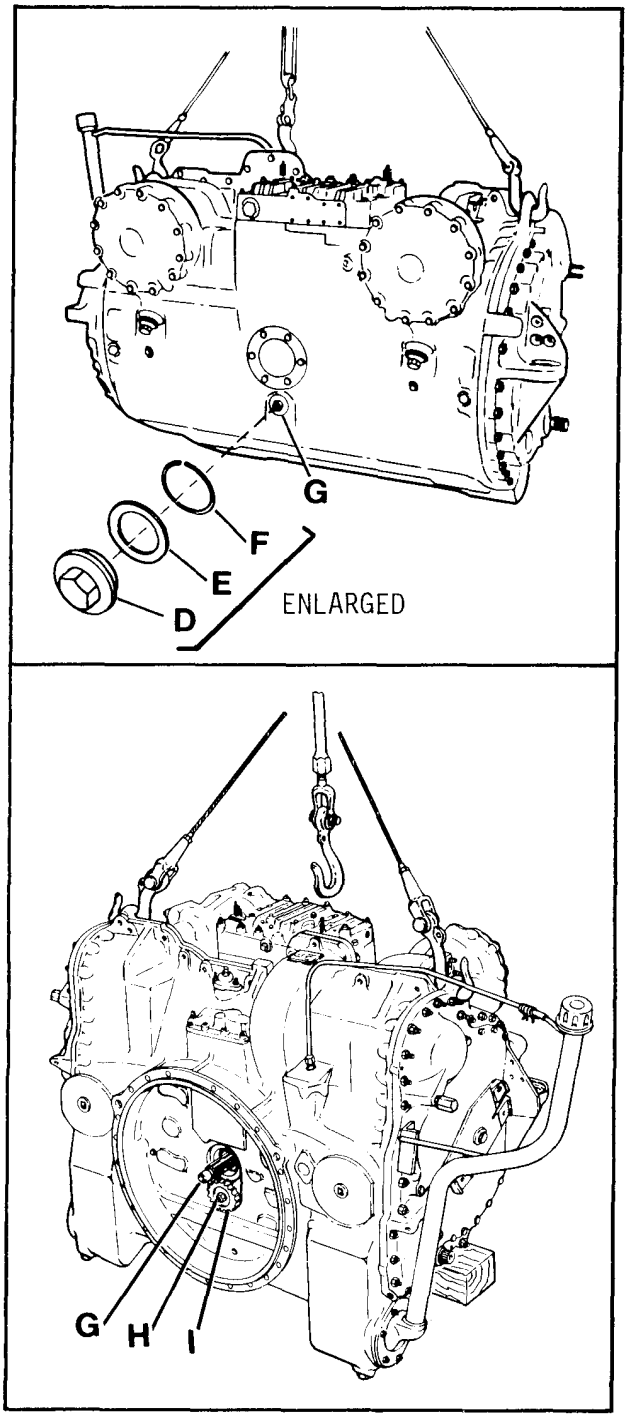
7. Remove input shaft (G) from front side of transmission.

8. Position hoist so transmission is over clean work surface and lower to surface. Use wook blocks to stabilize transmission, as necessary.

9. Use pry par to prevent rotation and, using 3/4-inch socket, extension, and breaker bar, remove self-locking nut (H) from oil input pump shaft.

10. Remove spur gear (oil input pump drive gear) (J) with aid of pry bar. Using 3/32-inch punch, remove Woodruff key from oil input pump shaft.

END OF TASK



TA 272328

LOOSEN BAND ADJUSTING SCREWS

TOOLS: 1-1/16-in. 1/2-in. drive socket
9/16-in. 1/2-in. drive socket
1/2-in. drive ratchet handle
1/2-in. drive breaker bar
1/2-to-3/4-in. adapter

SPECIAL TOOLS: Socket wrench socket, P/N 7003946

PRELIMINARY PROCEDURE: Drain Oil, Disconnect and Remove Straight Shaft (Input Shaft), Remove Oil Input Pump Drive Gear, and Position Transmission on Work Surface (Page 2-25)

NOTE

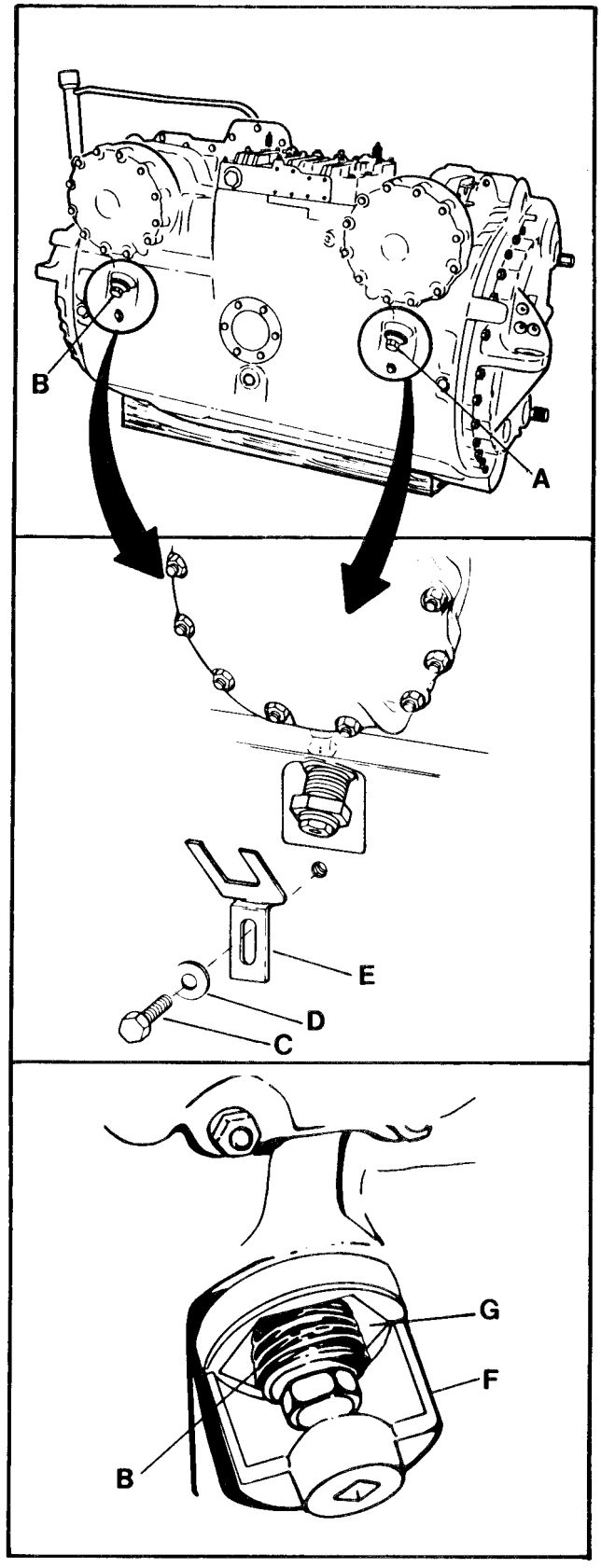
Low-range band adjusting screw (A) and reverse-range band adjusting screw (B) must be loosened to allow removal of the transmission end cover assemblies. The hardware (plates, self-locking nut, and adjusting screws) for the two bands is identical.

1. Using 9/16-inch socket and breaker bar, remove self-locking bolts (C), flat washers (D), and both locking plates (E).

2. Using socket wrench socket (F), adapter, and breaker bar, loosen each self-locking nut (G).

3. Using 1-1/16-inch socket and ratchet handle, loosen band adjusting screws (A) and (B) six turns each by turning them counterclockwise.

END OF TASK



TA 272329

REMOVE AND DISASSEMBLE SIDE OIL FILLER

TOOLS: 1/2-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive breaker bar
3/4-in. 1/2-in. drive socket
3/4-in. open end wrench
7/8-in. open end wrench
Hose clamp pliers

PRELIMINARY PROCEDURE: Loosen Band Adjusting Screws (Page 2-27)

1. Using 1/2-inch socket, extension, and breaker bar, remove six plain, hexagon nuts (A) and lockwashers (B).

2. Using 3/4-inch socket, remove two nuts (C) securing bracket (D) to end cover (E).

3. Using 3/4-inch open end wrench, hold adapter (F) to prevent it from turning. Using 7/8-inch open end wrench, disconnect nut (G) securing small tube assembly (H) to adapter (F) in housing (J).

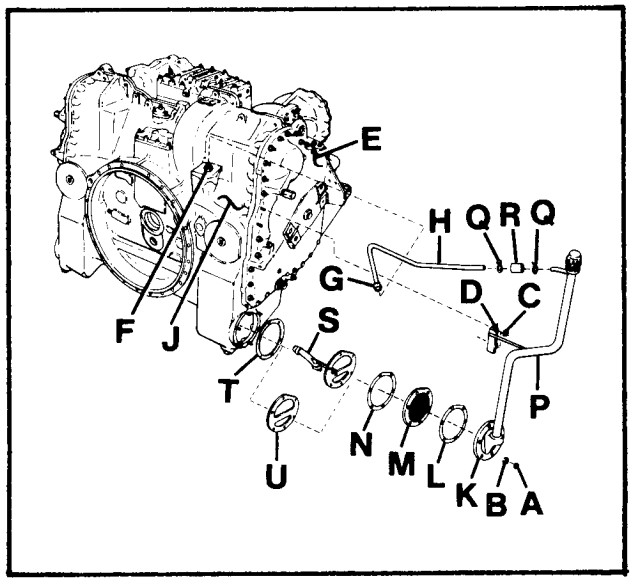
4. Remove cover (K), gasket (L), sediment strainer element (M), and gasket (N).

5. To separate small tube assembly (H) from large tube assembly (P), use hose clamp pliers to remove hose clamps (Q) and nonmetal tubing (R).

6. (CD 850-6A only). Remove strainer assembly (S) and gasket (T).

7. (CD 850-6 A-1 only). Remove side oil screen cover plate (U) and gasket (T).

END OF TASK



TA 272330

TURNING TRANSMISSION

TOOLS: Two hoists, 2-ton minimum capacity

SPECIAL TOOLS: Two lifting slings, P/N 7081593
Two “S” hooks, P/N 1165102

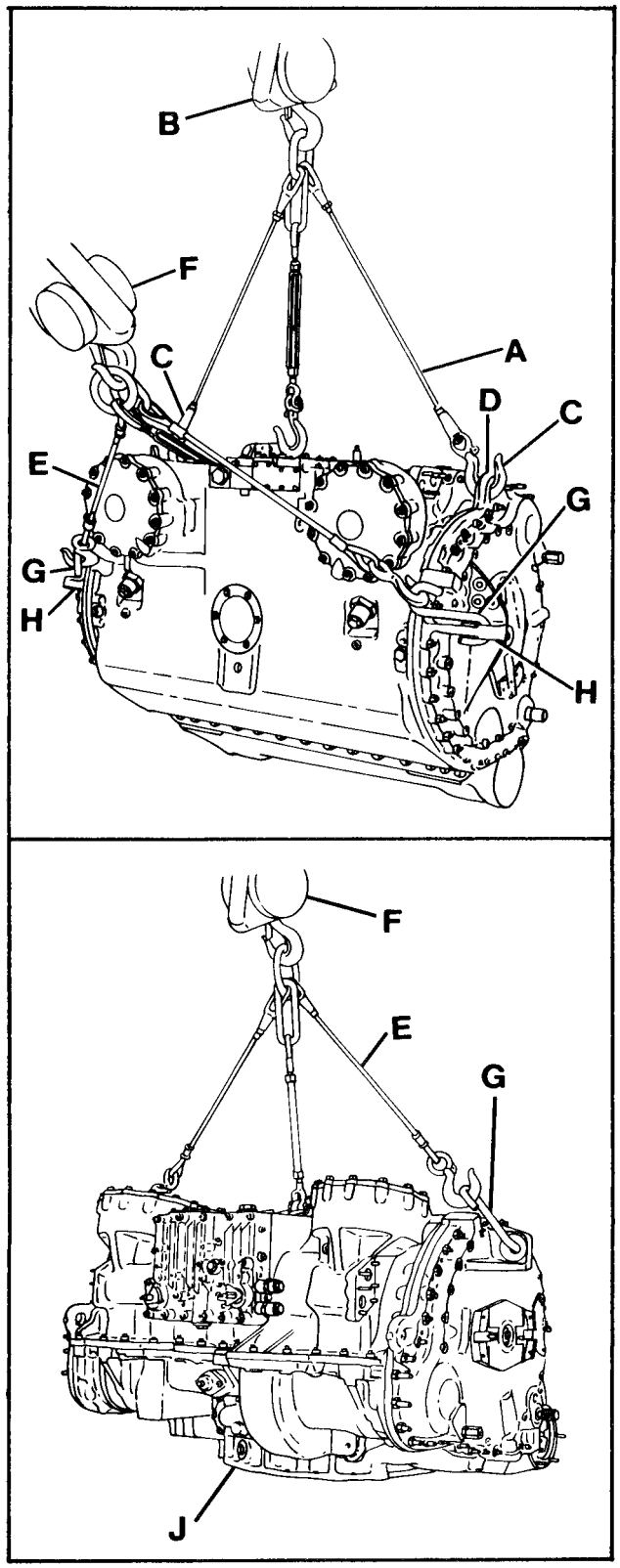
SUPPLIES: Wood blocks of various sizes.

PERSONNEL: Three persons recommended.

PRELIMINARY PROCEDURE: Remove and Disassemble Side Oil Filler (Page 2-28)

1. Attach lifting sling (A) to hoist (B) and attach two lifting sling hooks (C) to transmission end cover lifting eyes (D).
2. Raise transmission with hoist (B).
3. Attach lifting sling (E) to hoist (F) and "S" hooks (G). Insert “S” hooks (G) into transmission mounting flange holes (H).
4. Rotate transmission by raising hoist (F) until input flange (J) is downward. Lower hoist (B) and take away sling (A).
5. Operating hoist (F), carefully lower transmission to work surface so that it is resting on input flange (J).
6. Use wood blocks to stabilize as necessary.
7. Remove “S” hooks (G) and sling (E) from transmission.

END OF TASK



TA 272331

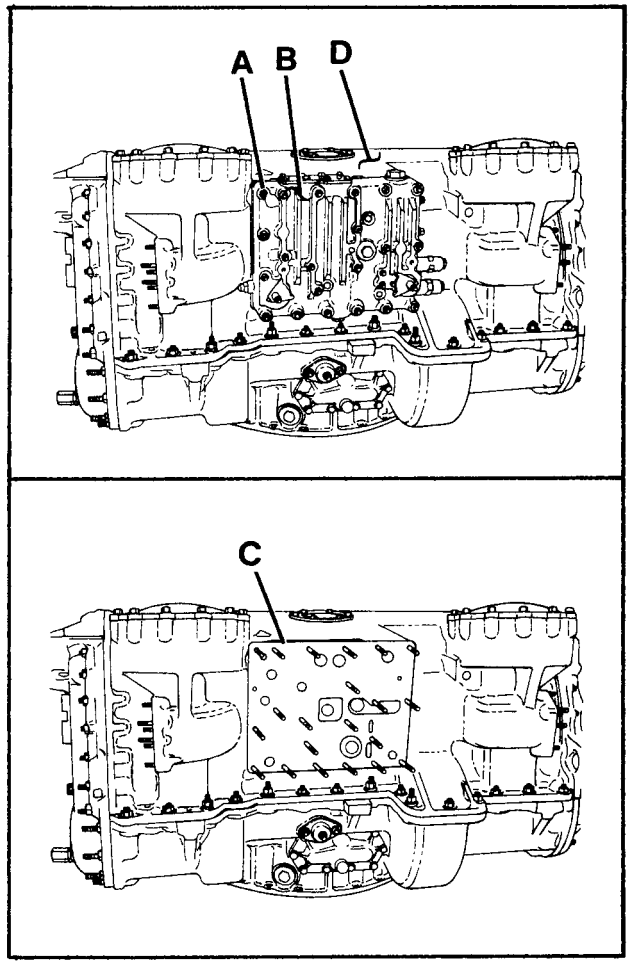
REMOVE CONTROL VALVE ASSEMBLY

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
Plastic insert hammer

PRELIMINARY PROCEDURE: Turning Transmission (Page 2-29)

1. Using socket and breaker bar, remove 22 hexagon plain nuts (A).
2. If valve assembly (B) and gasket (C) are stuck to rear mechanical housing (D), use a plastic insert hammer to tap valve assembly (B) free.
3. Lift valve assembly (B) from housing (D).
4. Remove gasket (C).

END OF TASK



TA 272332

REMOVE LEFT END COVER ASSEMBLY (Sheet 1 of 2)

TOOLS: 3/4-in. 1/2-in. drive deep well socket
9/16-in. 1/2-in. drive socket
5/8-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive ratchet handle
Hoist, 2-ton minimum capacity
1/2-in. drive breaker bar

SPECIAL TOOLS: End cover lifting bracket, P/N 11650103
Mechanical puller, P/N 7083894
(2 required)

SUPPLIES: One 1/2-20 x 2 in. bolt
Two 3/8-24 x 3-3/4-in. bolts

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Remove Control Valve Assembly (Page 2-30).

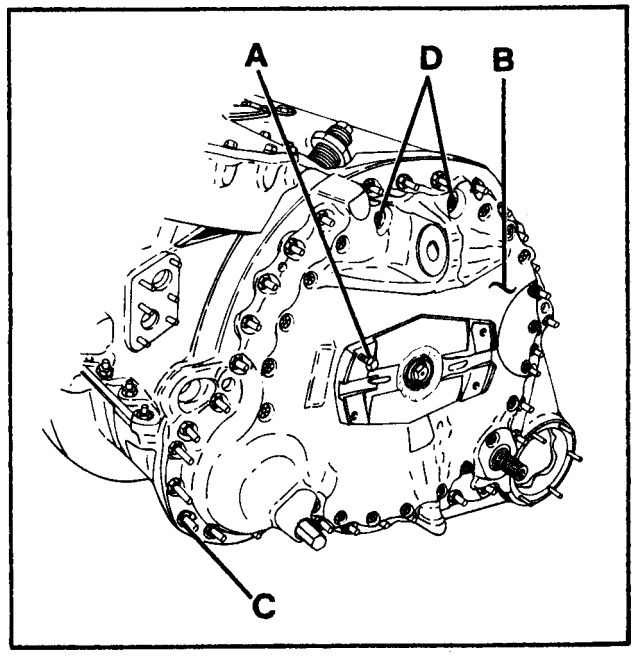
1. Using 3/4-inch socket and ratchet handle, install one 1/2-20 x 2 inch bolt (A) in one of the thrust washer bearing (output flange) holes. Tighten the bolt until it reaches end cover assembly (B).

NOTE

Bolt (A) will help keep brake plates from falling out when end cover assembly (B) is removed.

2. Using 3/4-inch socket, extension, and breaker bar, remove 34 plain, hexagon nuts (C) located along outer edge of end cover assembly (B).

3. Using 9/16-inch socket and breaker bar, remove two brake anchor retaining bolts (D).



TA 272333

Go on to Sheet 2.

REMOVE LEFT END COVER ASSEMBLY (Sheet 2 of 2)

4. Using 9/16-inch socket and ratchet handle, attach lifting bracket (E) to end cover assembly (B) with the two 3/8-inch bolts (F). Tighten bolts (F).

5. Attach hoist to lifting bracket (E) and take up all slack.

6. Thread two mechanical pullers (G) into threaded holes.

7. Using 5/8-inch socket and ratchet handle, tighten two mechanical pullers (G) evenly-to pull cover (B) from transmission housing dowels.

WARNING

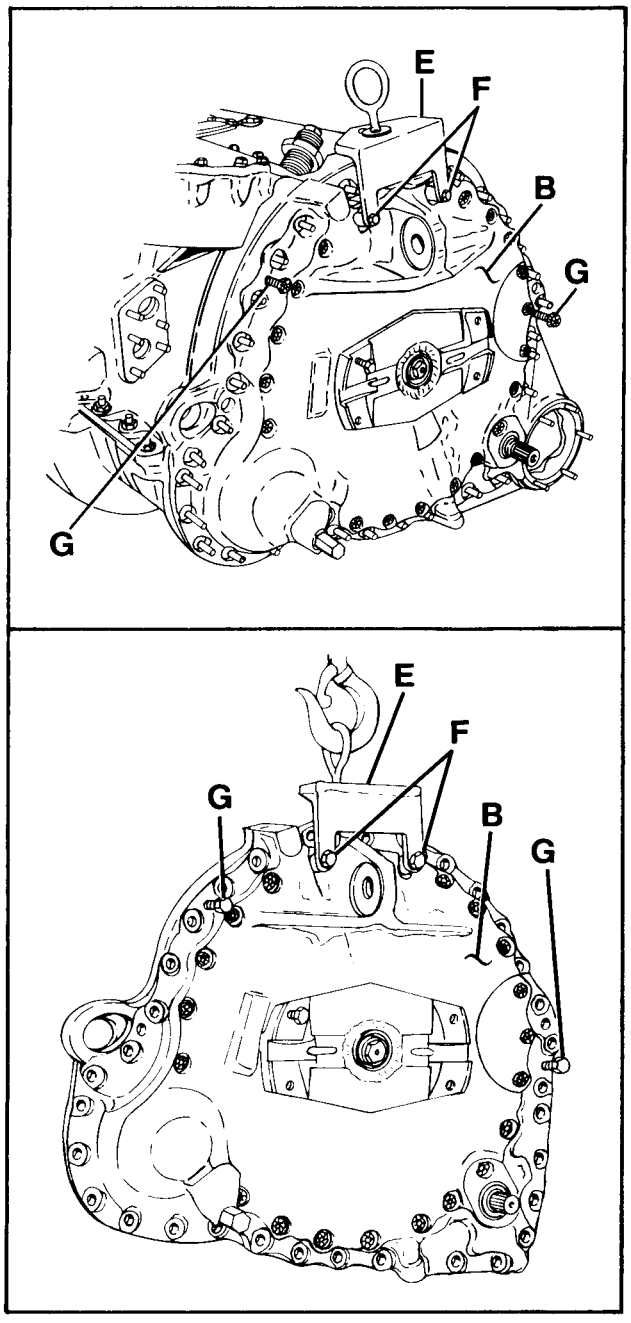
The internal gear (output ring gear) and attached parts may stay either with the end cover or inside the housing. Use care not to drop ring gear when removing end cover assembly (B). Injury to personnel may occur if ring gear is dropped.

8. Carefully work end cover assembly (B) free and remove end cover with attached parts.

9. Being careful that parts do not drop out, use hoist to move left end cover assembly (B) to clean work surface.

10. Using 5/8-inch socket and breaker bar, remove mechanical pullers (G). Using 9/16-inch socket and breaker bar, remove two 3/8-inch bolts (F) and lifting bracket (E).

END OF TASK



TA 272334

REMOVE RIGHT END COVER ASSEMBLY (Sheet 1 of 2)

TOOLS: 3/4in. 1/2-in. drive deep well socket
5/8-in. 1/2-in. drive socket
9/16-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive ratchet handle
Hoist, 2-ton minimum capacity
1/2-in. drive breaker bar

SPECIAL TOOLS: End cover lifting bracket P/N 11650103
Mechanical puller, P/N 7083894 (2 required)

SUPPLIES: One 1/2-20 x 2-in. bolt
Two 3/8-24 x 3-3/4-in. bolts

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Remove Left End Cover Assembly (Page 2-31)

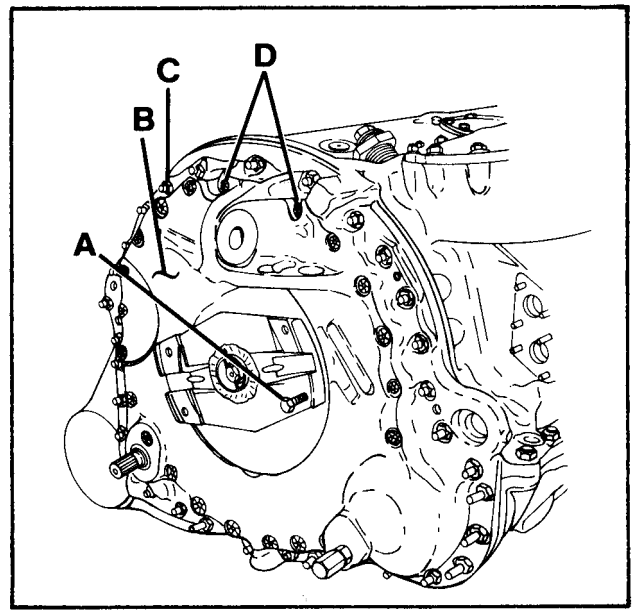
1. Using 3/4-inch socket and ratchet handle, install one 1/2-20 x 2-inch bolt (A) in one of the thrust washer bearing (output flange) holes. Tighten the bolt until it touches end cover assembly (B).

NOTE

Bolt (A) will keep brake plates from falling out when end cover assembly (B) is removed.

2. Using 3/4-inch socket, extension, and breaker bar, remove 34 plain, hexagon nuts (C) located along outer edge of end cover assembly (B).

3. Using 9/16-inch socket and breaker bar, remove two brake anchor retaining bolts (D).



TA 272335

Go on to Sheet 2.

REMOVE RIGHT END COVER ASSEMBLY (Sheet 2 of 2)

4. Using 9/16-inch socket and ratchet handle, attach lifting bracket (E) to end cover assembly (B) with two 3/8-inch bolts (F). Tighten bolts (F).

5. Attach hoist to lifting bracket (E) and take up all slack.

6. Thread two mechanical pullers (G) into threaded holes.

7. Using 5/8-inch socket and ratchet handle, tighten two mechanical pullers (G) evenly to pull end cover assembly (B) from transmission dowels.

WARNING

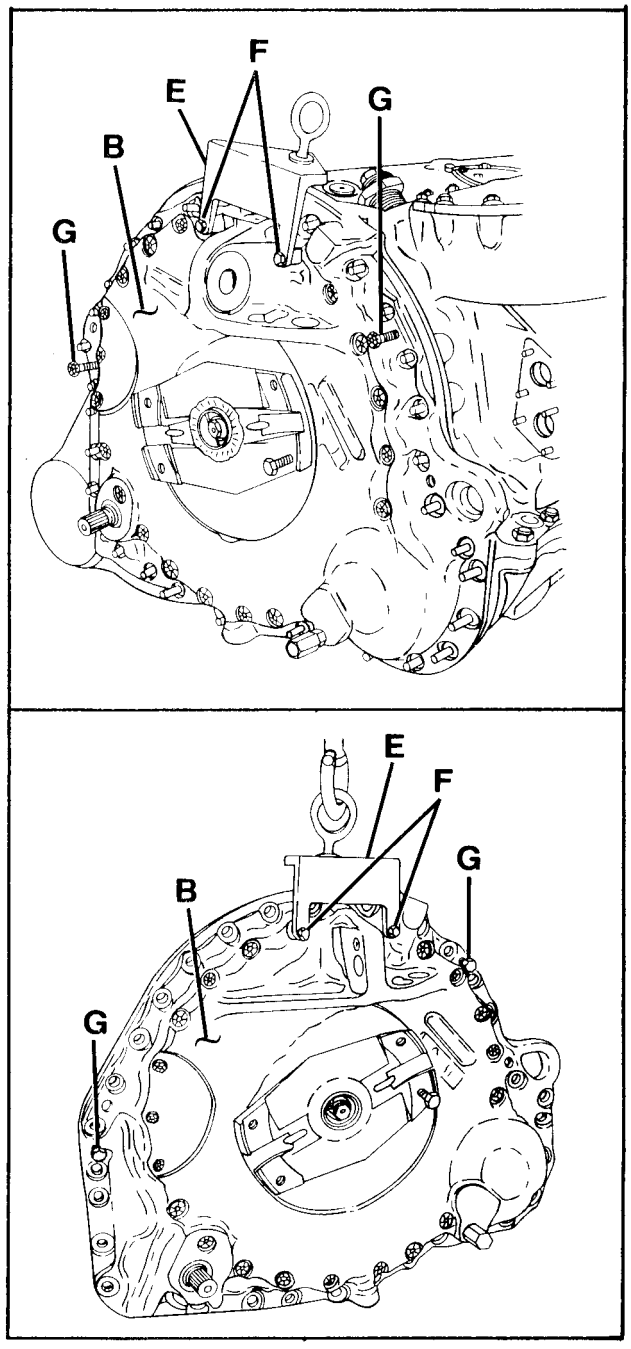
The internal gear (output ring gear) and attached parts may stay either with the end cover or inside the housing. Use care not to drop ring gear when removing end cover assembly (B). Injury to personnel may occur if ring gear is dropped.

8. Carefully work end cover assembly (B) free and remove end cover with attached parts.

9. Being careful that parts do not drop out, use hoist to move right end cover assembly (B) to clean work surface.

10. Using 5/8-inch socket and breaker bar, remove mechanical pullers (G). Using 9/16-inch socket and breaker bar, remove two 3/8-inch bolts (F) and lifting bracket (E).

END OF TASK



TA 272336

REMOVE SHOULDERED SHAFTS (LONG AND SHORT STEER SHAFTS)

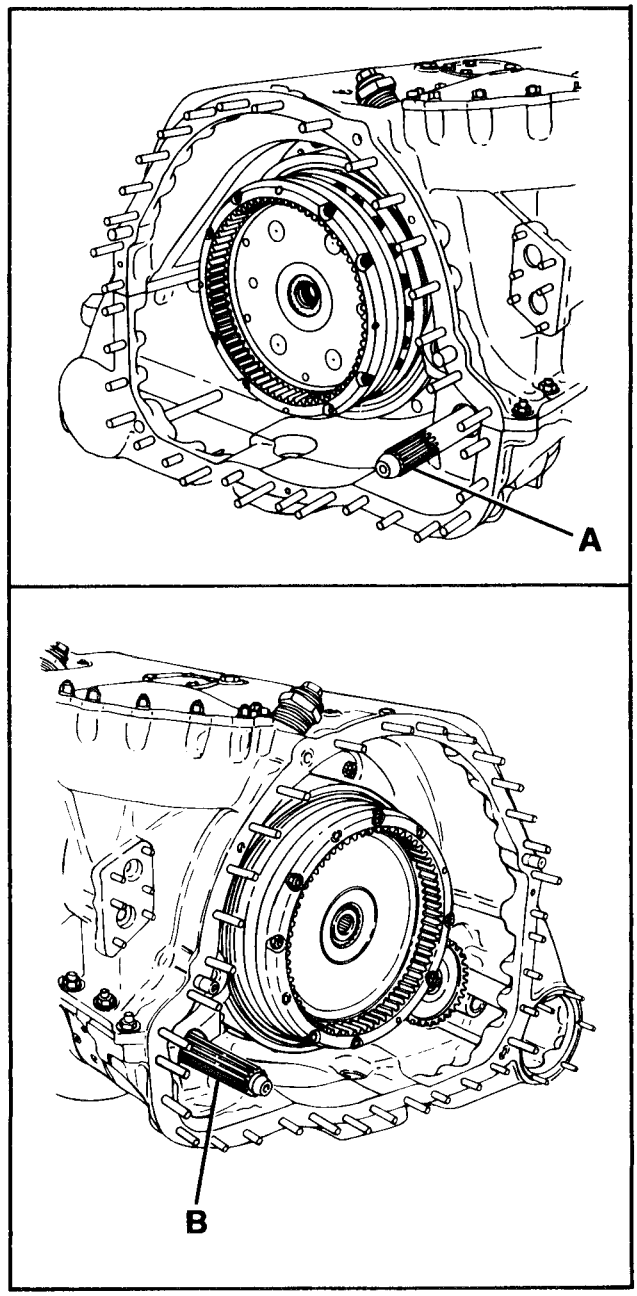
TOOLS: None

PRELIMINARY PROCEDURE: Remove End Cover Assemblies (Pages 2-31 and 2-33)

1. Remove long steer shaft (A) from right end of transmission.

2. Remove short steer shaft (B) from left end of transmission.

END OF TASK



TA 272337

REMOVE LOW-RANGE CARRIER ASSEMBLY AND RIGHT OUTPUT INTERNAL GEAR

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
1/2-in. drive torque wrench
Pry bar (two required)

PERSONNEL: Two persons recommended

PRELIMINARY PROCEDURE: Remove Shouldered Shafts (Long and Short Steer Shafts) (Page 2-35)

CAUTION

When removing components from right end of the transmission, do not pull main shaft assembly (A) out of reverse-range carrier assembly, left output internal gears, and reverse and output gear hub assembly or they will fall from left end of transmission.

NOTE

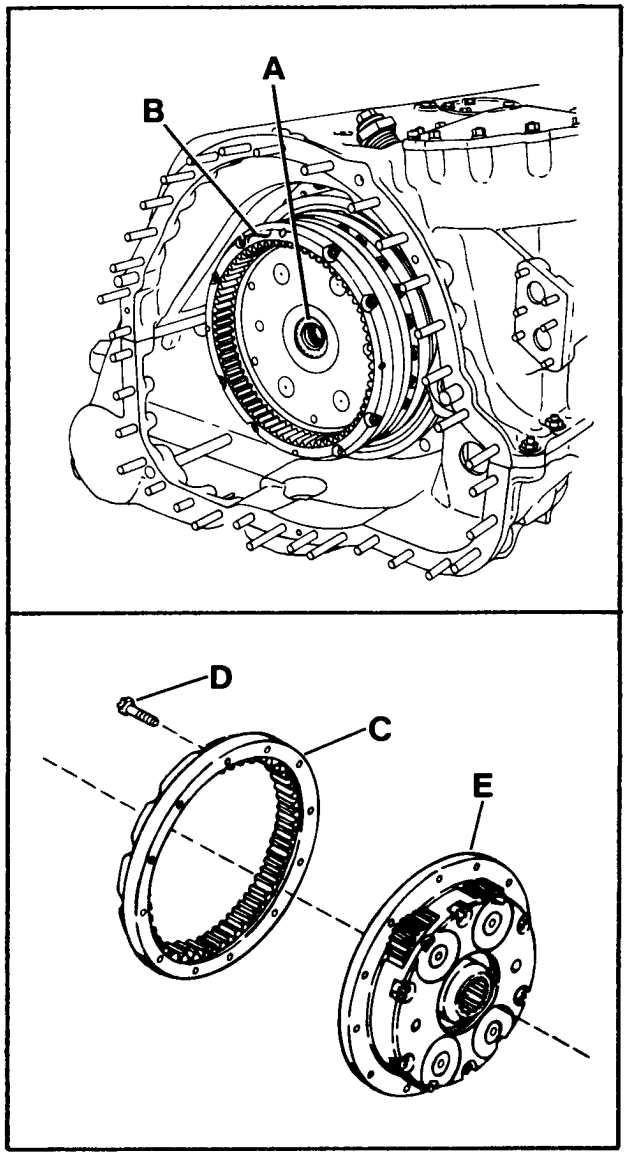
Low-range carrier and right output internal gear assembly (B) may be with right end cover assembly or transmission housing.

1. Remove low-range carrier and right output internal gear assembly (B).
2. Remove thrust washer bearing either from back side of carrier and gear assembly (B) or from hub inside the transmission.

NOTE

Do steps 3 and 4 only if right output internal gear (C) must be replaced because of damage.

3. Using 9/16-inch socket and breaker bar, remove eight self-locking bolts (D). Using two pry bars, remove internal gear (C) from low-range carrier assembly (E).
4. Install new gear (C) onto low-range carrier assembly (E). Install eight bolts (D). Using torque wrench, tighten bolts (D) to 41 to 49 lb-ft (56 to 66 N•m).



TA 272338

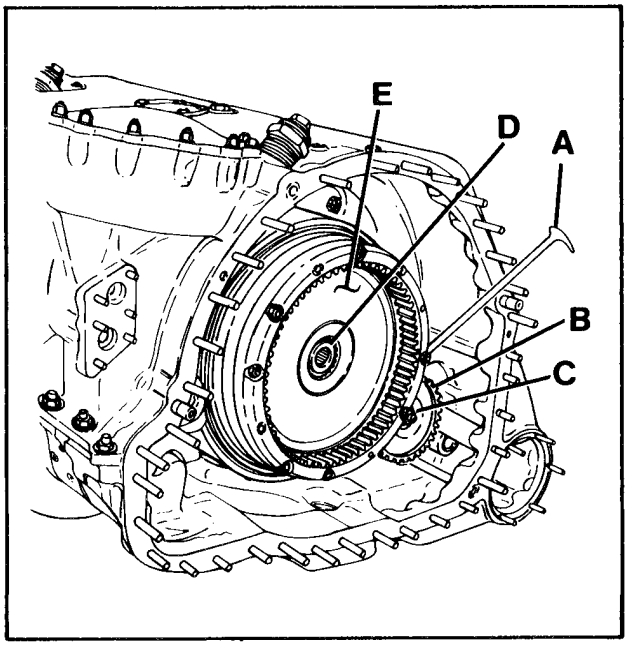
END OF TASK

REMOVE LEFT OUTPUT INTERNAL GEARS AND REVERSE AND OUTPUT GEAR HUB ASSEMBLY (Sheet 1 of 2)

TOOLS: 3/4-in. 1/2-in. drive socket
5/8-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive breaker bar
9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
9/16-in. combination wrench
Pry bar (two required)
Arbor press

PERSONNEL: Two persons recommended

PRELIMINARY PROCEDURE: Remove Low-Range Carrier Assembly and Right Output Internal Gear (Page 2-36)



1. Use pry bar (A) to hold spur gear (output oil pump drive gear) (B) in place.

2. (CD 850-6A Only). Using 5/8-inch socket, extension, and breaker bar, remove self-locking nut (C).

3. (CD 850-6A1 Only). Using 3/4-inch socket, extension and breaker bar, remove self-locking nut (C).

4. Using pry bar, remove output oil pump drive gear (B).

CAUTION

To prevent components from falling, make very sure you do not pull main shaft assembly (D) out of transmission.

5. Remove left output internal gears and hub assembly (E) from left end of main shaft assembly (D).

6. Remove thrust washer bearing either from back side of gears and hub assembly (E) or from reverse-range carrier assembly inside transmission.

Go on to Sheet 2.

TA 272339

REMOVE LEFT OUTPUT INTERNAL GEARS AND REVERSE AND OUTPUT GEAR HUB ASSEMBLY (Sheet 2 of 2)

NOTE

Do steps 7 thru 11 only if repair of components is necessary because of damage.

7. Using 9/16-inch socket and breaker bar on hexagon, plain nuts (F) and combination wrench on heads of machine bolts (G), remove the eight nuts (F) and lock washers (H) from the eight bolts (G). Remove the bolts.

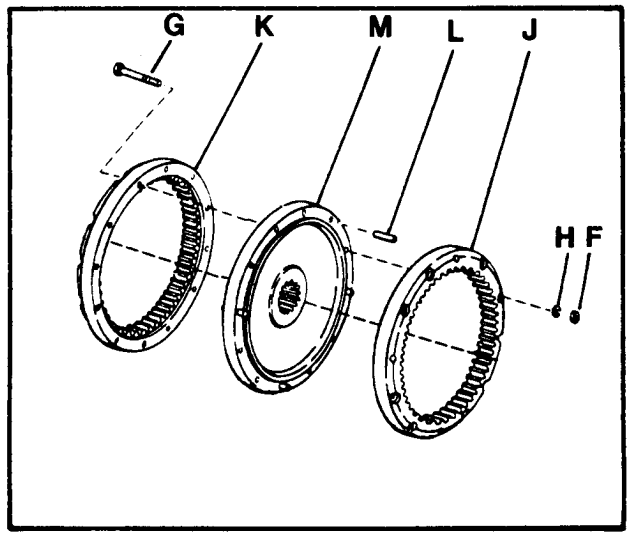
8. Using pry bars, remove internal gears (J) and (K).

9. If any of four dowel pins (L) are damaged, use an arbor press to press out damaged pins (L) and install new ones. Press each pin so that the height of the pin is equal on both sides of hub (M).

10. Install internal gears (J) and (J) on to hub (M).

11. Install bolts (G), lockwashers (H), and nuts (F) by hand. Hold bolts (G) with wrench and, using 9/16-inch socket and torque wrench, tighten nuts to 36-43 lb-ft (49-59 N•m).

END OF TASK



TA272390

REMOVE REVERSE-RANGE CARRIER ASSEMBLY

TOOLS: None

PERSONNEL: Two persons recommended.

PRELIMINARY PROCEDURE: Remove Left Output Internal Gears and Reverse and Output Gear Hub Assembly (Page 2-37)

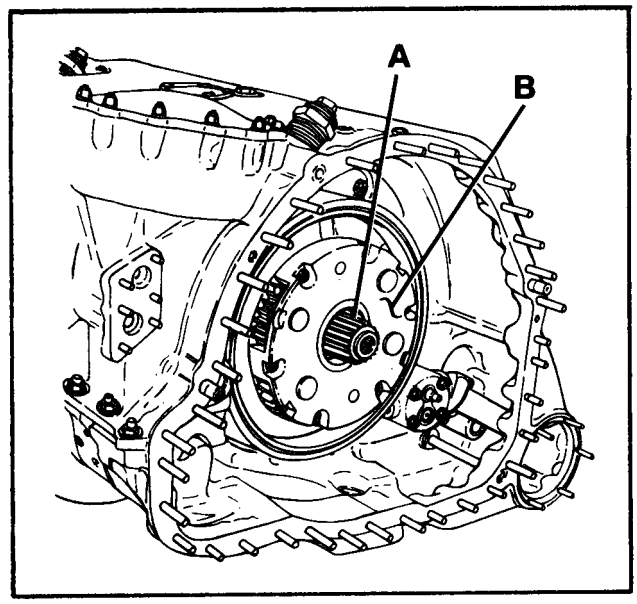
CAUTION

To prevent components from falling, make sure you do not pull main shaft assembly (A) out of transmission.

1. Remove carrier assembly (B) from main shaft assembly (A).

2. Remove thrust washer bearing from back side of carrier assembly (B).

END OF TASK



TA 272340

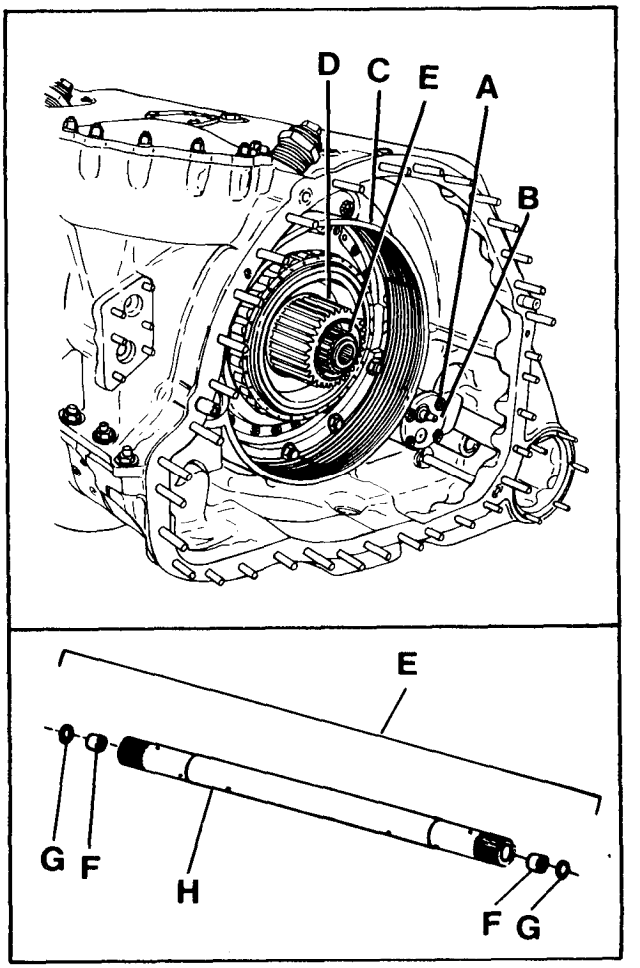
REMOVE OIL OUTPUT PUMP, BRAKE BAND ASSEMBLY (REVERSE-RANGE BAND ASSEMBLY), REVERSE-RANGE SUN GEAR ASSEMBLY, AND MAIN SHAFT ASSEMBLY (MAIN CROSS-DRIVE SHAFT ASSEMBLY)

TOOLS: Chisel
Machinist's hammer
Bearing puller
Slide hammer
9/16-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive breaker bar

PRELIMINARY PROCEDURE: Remove Reverse-Range Carrier Assembly (Page 2-39)

1. Using 9/16-inch socket, extension, and breaker bar, remove four self-locking bolts (A).
2. Remove transmission (output) oil pump assembly (B).
3. Remove reverse range band assembly (C).
4. Remove sleeve bearing and spur gear (reverse sun gear) (D) from main shaft assembly (E).
5. Remove main shaft assembly (E) from left end of transmission.
6. If necessary to replace needle roller bearings (F), use chisel and hammer to destake and remove shims (G). Using bearing puller and slide hammer, remove bearings (F) from main shaft (H).

END OF TASK



TA 272341

DISCONNECT INNER UNIT ASSEMBLY FROM FRONT AND REAR MECHANICAL HOUSINGS

TOOLS: 3/4-in. 1/2-in. drive socket
1/2-in. drive 10-in. long extension
1/2-in. drive breaker bar
3/4-in. box wrench

SPECIAL TOOLS: Mechanical puller adapter, P/N 7083673
Attachment puller, P/N 7082201

PRELIMINARY PROCEDURE: Remove Oil Output Pump, Brake Band Assembly (Reverse-Range Band Assembly), Reverse-Range Sun Gear Assembly, and Main Shaft (Main Cross-Drive Shaft Assembly) (Page 2-40)

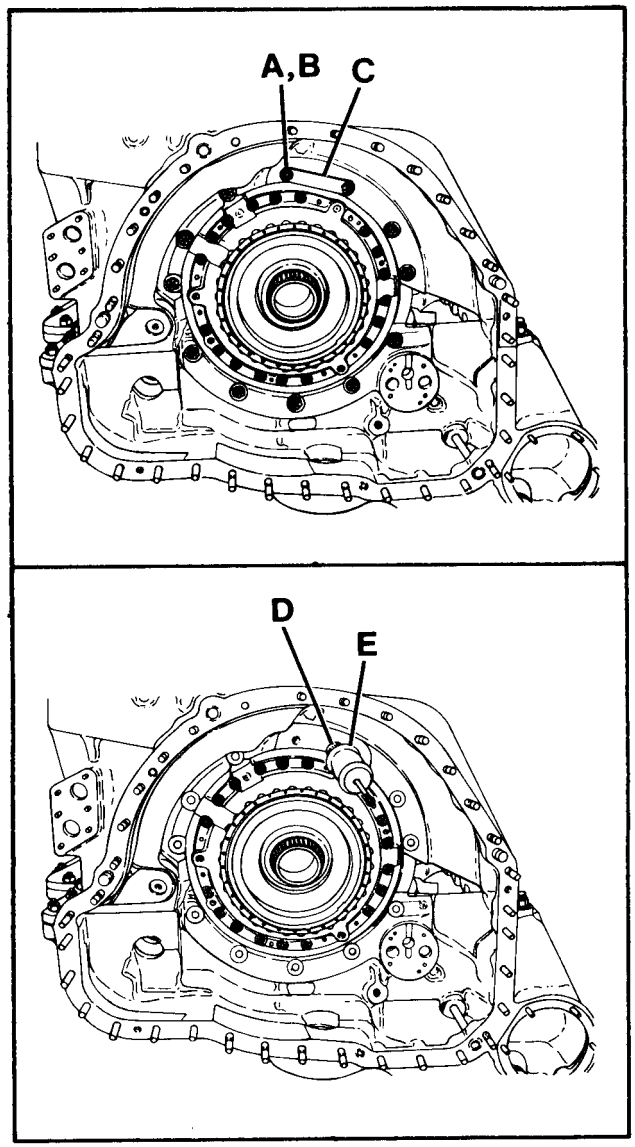
1. Using socket, extension, and breaker bar, remove 12 self-locking bolts (A), 10 flat washers (B), and dowel pin locking plate (C).

2. Thread mechanical puller adapter (D) into dowel pin by hand.

3. Using 3/4-inch box wrench, tighten mechanical puller adapter (D).

4. Thread attachment puller (E) into adapter (D). Slide attachment puller in and out to remove dowel pin.

END OF TASK



TA 272342

REMOVE SPUR GEAR (HIGH-RANGE CLUTCH HUB AND INTEGRAL LOW-RANGE SUN GEAR)

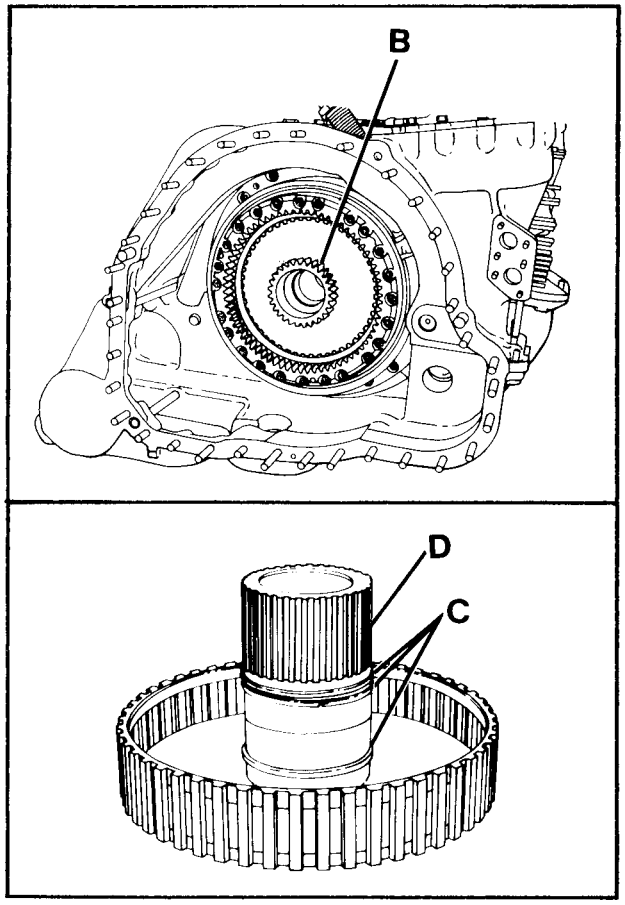
TOOLS: External retaining ring pliers

PRELIMINARY PROCEDURE: Disconnect Inner Unit Assembly From Front and Rear Mechanical Housings (Page 2-41)

1. Remove high-range clutch hub and integral low-range sun gear (B).

2. Using external retaining ring pliers, remove three metal seal rings (C) from hub (D).

END OF TASK



TA 272343

REMOVE LOW-RANGE INTERNAL GEAR, CLUTCH DISK (HIGH-RANGE CLUTCH COVER PLATE), CLUTCH DISK (HIGH-RANGE CLUTCH PLATE), AND PRESSURE PLATE (Sheet 1 of 2)

TOOLS: 9/16-in. 1/2-in. drive socket
Pry bar
1/2-in. drive breaker bar
1/2-in. drive 5-in. long extension

PRELIMINARY PROCEDURE: Remove Spur Gear (High-Range Clutch Hub and Integral Low-Range Sun Gear) (Page 2-42)

PERSONNEL: Two persons required.

1. Place pry bar (A) between internal gear (B) and mechanical housing (C) to prevent gear (B) from turning.

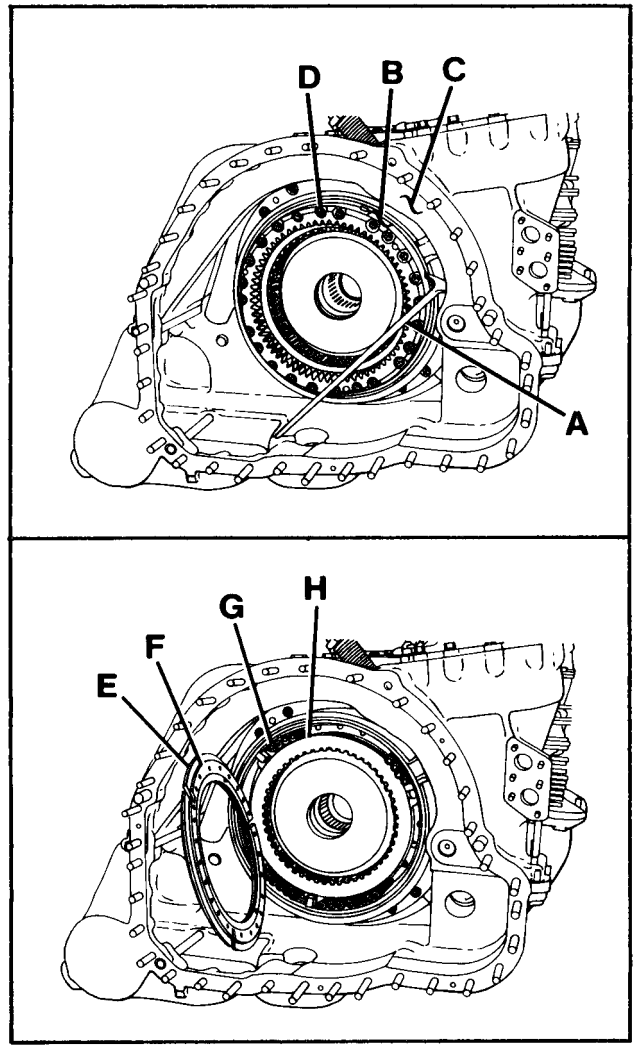
WARNING

Internal gear (B) is held against spring force. Use care to hold gear (B) when removing self-locking bolts (D).

2. Using socket and breaker bar, remove 24 self-locking bolts (D). Remove pry bar (A) and internal gear (B).

3. Remove high-range clutch cover plate (E) along with outer pressure plate (F).

4. Remove 24 compression, helical springs (clutch release springs) (G) and eleven clutch disks (high-range clutch plates) (H).



Go on to Sheet 2.

TA 272344

REMOVE LOWRANGE INTERNAL GEAR, CLUTCH DISK (HIGH-RANGE CLUTCH COVER PLATE), CLUTCH DLSK (HIGH-RANGE CLUTCH PLATE), AND PRESSURE PLATE (Sheet 2 of 2)

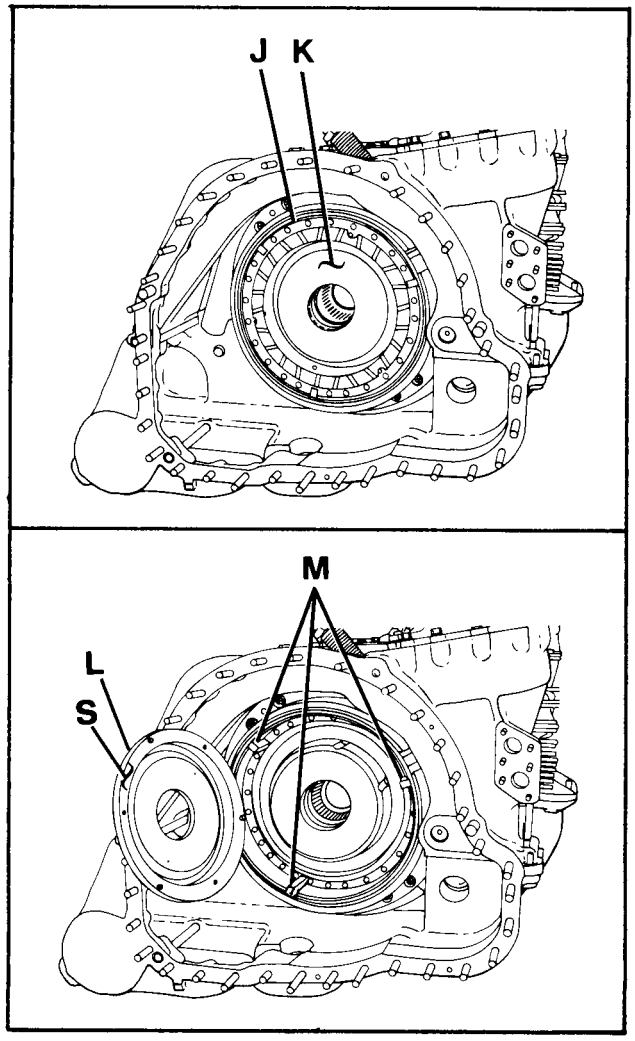
5. Remove high-range clutch inner pressure plate (J).

6. Remove transmission clutch piston (high-range clutch piston) (K).

7. Remove rubber seal (oil seal) (L) from high-range clutch pision (K).

8. Remove three machine keys (clutch plate drive keys) (M).

END OF TASK



TA272345

REMOVE LOW-RANGE DRUM, BRAKE BAND ASSEMBLY (LOW-RANGE BAND ASSEMBLY), AND TORQUE CONVERTER OUTPUT SHAFT

TOOLS: 9/16-in. 1/2-in. drive socket
5/32-in. hex key wrench
1/2-in. drive ratchet handle

SPECIAL TOOLS: Assembly remover, P/N 8356051 (Three required)

PRELIMINARY PROCEDURE: Remove Low-Range Internal Gear, Clutch Disk (High-Range Clutch Cover Plate), Clutch Disk (High-Range Clutch Plate), and Pressure Plate (Page 2-44)

1. Using hex key wrench, remove three setscrews (A).

NOTE

Jack bolt (B) of each assembly remove (C) must index with key slot hole (D).

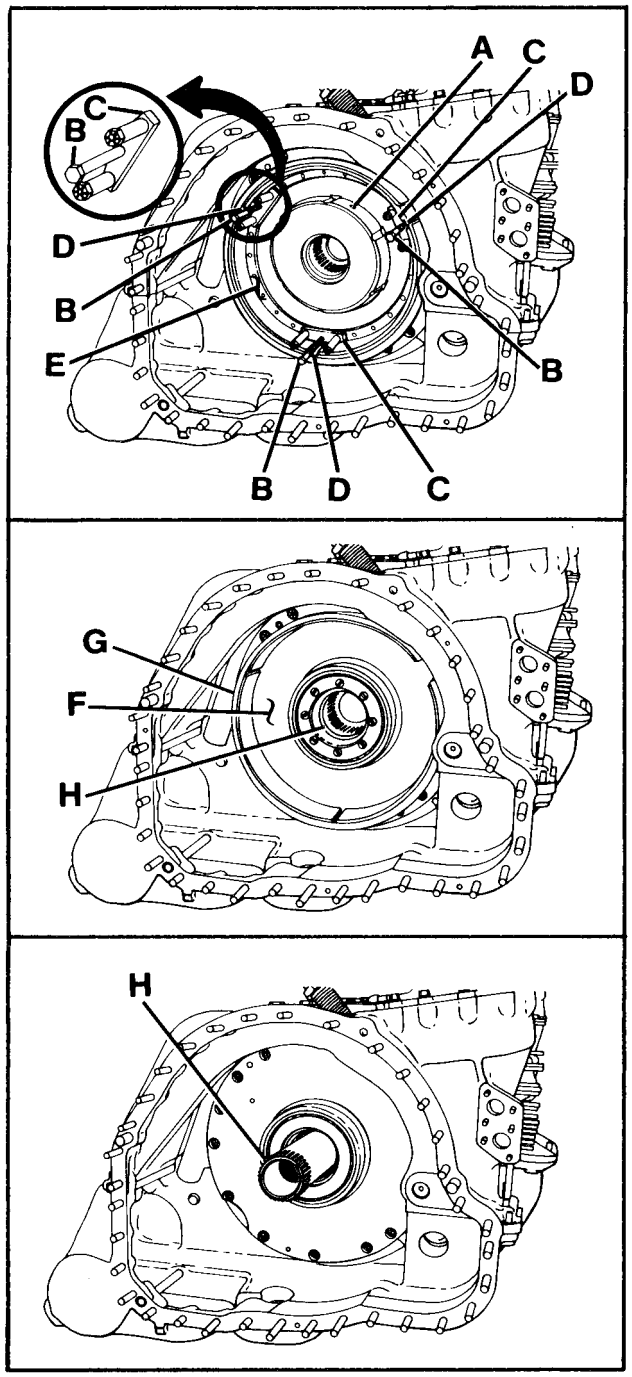
2. Thread three assembly removers (C) into low-range drum (E) using two of the high-range clutch bolts removed on page 2-43 for each assembly remover (C).

3. Using socket and handle, tighten assembly removers (C) equally to force drum (E) off inner unit assembly (F). Remove drum (E). Remove assembly removers and bolts.

4. Remove low-range band assembly (G).

5. Remove torque converter output shaft (H).

END OF TASK



TA 272346

REMOVE REAR MECHANICAL HOUSING (Sheet 1 of 2)

TOOLS: Pry bar
5/8-in. 1/2-in. drive socket
3/4-in. 1/2-in. drive socket
3/4-in. combination wrench
1/2-in. drive breaker bar
1/2-in. drive ratchet handle
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling, P/N 7083778
Machine bolt (puller bolt), P/N 7737292 (four required

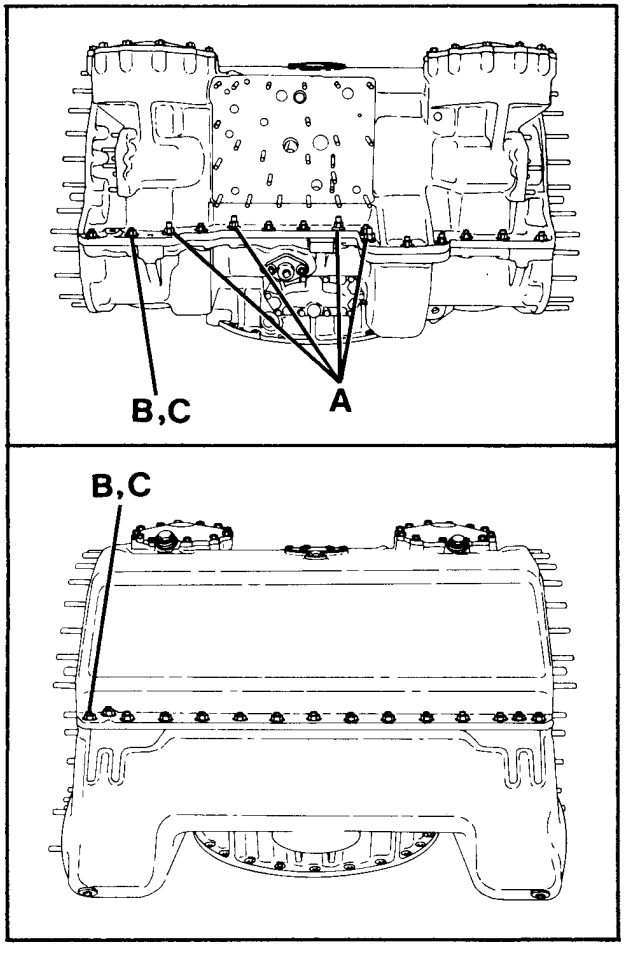
PERSONNEL: Three persons recommended

PRELIMINARY PROCEDURE: Remove Low-Range Drum, Brake Band Assembly (Low-Range Band Assembly), and Torque Converter Output Shaft (Page 2-45)

1. Using combination wrench, remove four plain hexagon nuts, lockwashers, and spacers from locations A.

2. Using 3/4-inch socket and breaker bar, remove remaining 26 nuts (B) and plain washers (C).

Go on to Sheet 2.



TA 272347

REMOVE REAR MECHANICAL HOUSING (Sheet 2 of 2)

3. Attach sling (D) to hoist and to seventh stud (E) up from splitline (F) on each end of rear housing (G). Raise hoist to take up slack from sling (D).

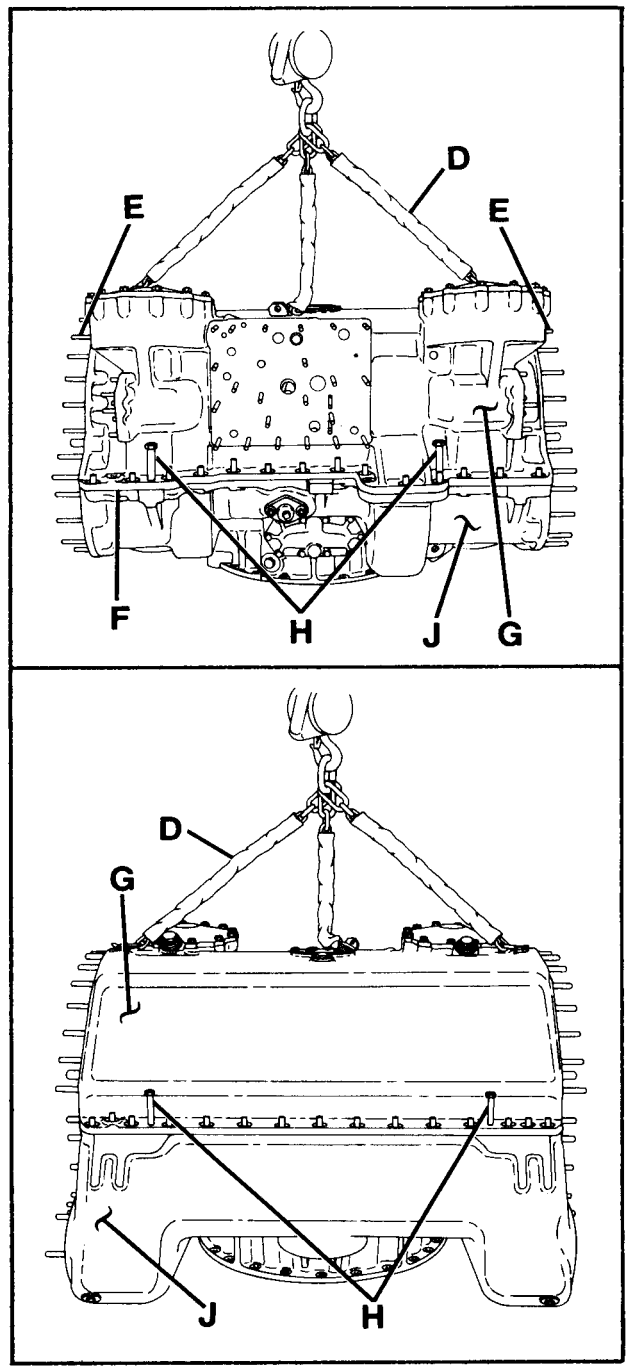
4. Thread four puller bolts (H) into threaded holes in rear housing (G).

5. Using 5/8-inch socket and ratchet handle, tighten four puller bolts (H) to separate rear housing (G) from front housing (J). Use pry bar if necessary.

6. Raise rear housing (G) with hoist and sling (D) and move to clean work surface.

7. Remove four puller bolts (H). Remove sling (D) and hoist.

END OF TASK



TA 272348

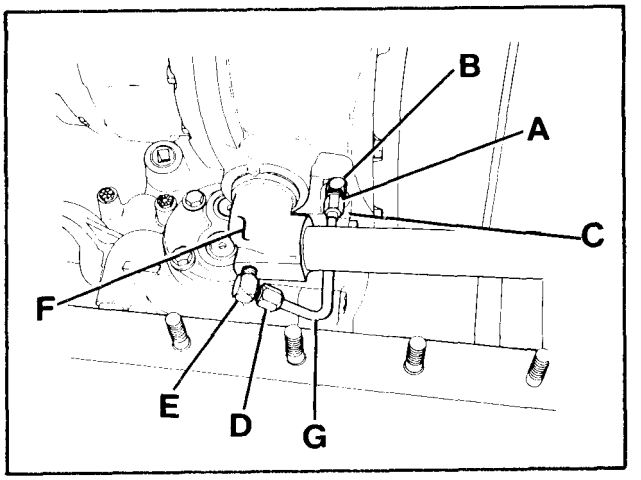
REMOVE OIL PRESSURE REGULATOR TUBE ASSEMBLY (CD 850-6A-1 ONLY)

TOOLS: 9/16-in. line wrench

PRELIMINARY PROCEDURE: Remove Rear Mechanical Housing (Page 2-46)

1. Using wrench, unscrew oil tube nut (A) from elbow fitting (B) on oil input pump (C).
2. Using wrench, unscrew oil tube nut (D) from elbow fitting (E) on elbow assembly (F).
3. Remove oil tube assembly (G).

END OF TASK



TA 272349

REMOVE INNER UNIT ASSEMBLY

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
1/2-in. drive ratchet handle
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Hoisting adapter, P/N 7081501

SUPPLIES: 3/8-24 x 1-3/4-in. bolt (four required)

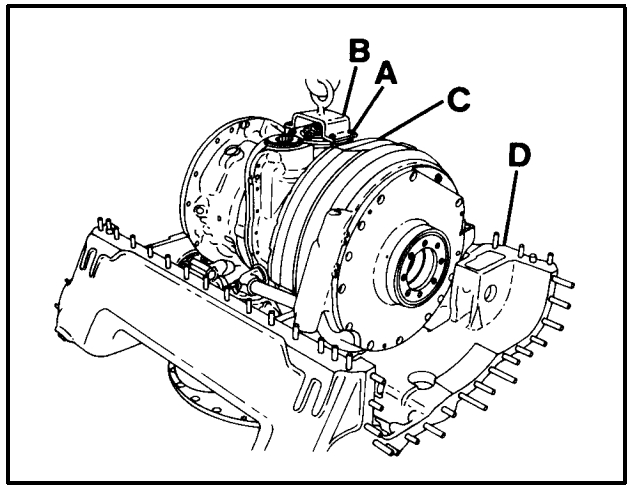
PRELIMINARY PROCEDURE: Remove Rear Mechanical Housing (CD 850-6A Only, Page 2-46) or Remove Oil Pressure Regulator Tube Assembly (CD 850-6A-1 Only, Page 2-48)

1. Using socket and breaker bar, remove four bolts from locations (A) to allow for installation of hoisting adapter (B).

2. Using socket and ratchet handle, attach hoisting adapter (B) with four 3/8-24 x 1-3/4 inch bolts at locations (A).

3. Using hoist, raise inner unit (C) out of housing (D). Set inner unit (C) on work surface.

4. Using socket and ratchet handle, remove four-bolts from locations (A). R-emove hoisting adapter (B).



END OF TASK

TA 272350

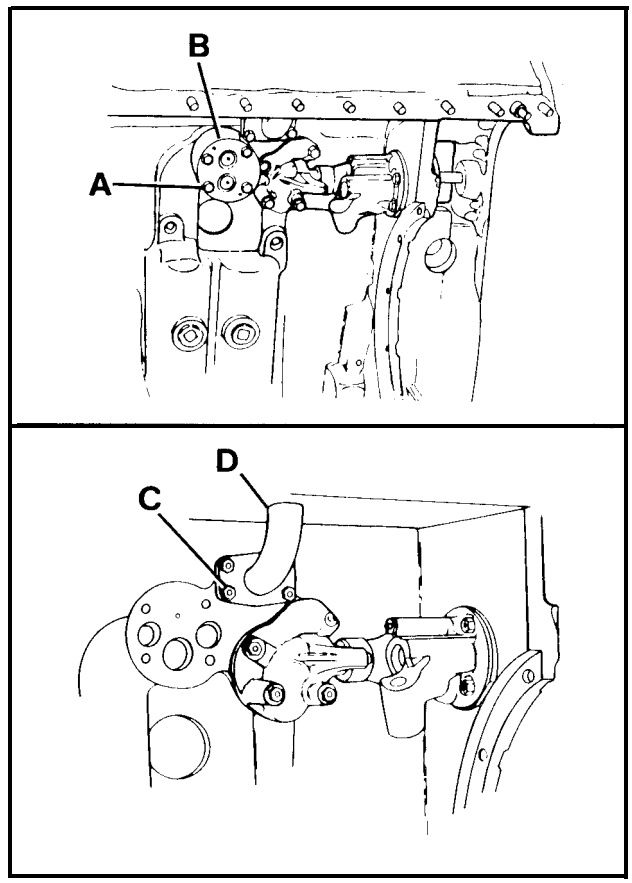
REMOVE OIL INPUT PUMP AND INPUT PUMP TUBE ASSEMBLY (CD 850-6A ONLY)

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive breaker bar

PRELIMINARY PROCEDURE: Remove Inner Unit Assembly (Page 2-49).

1. Using 9/16-inch socket, extension, and breaker bar, remove four self-locking bolts (A).
2. Remove oil input pump (B).
3. Using 1/2-inch socket, extension, and breaker bar, remove four self-locking bolts (C).
4. Remove metal tube assembly (D).

END OF TASK



TA 272351

REMOVE OIL INPUT PUMP AND VALVE ASSEMBLY (CD 850-6A-1 ONLY)

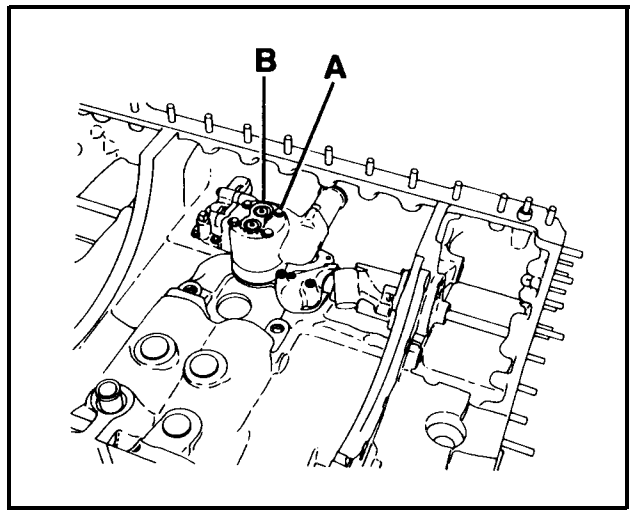
TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive breaker bar

PRELIMINARY PROCEDURE: Remove Inner Unit Assembly (Page 2-49)

1. Using socket, extension, and breaker bar, remove four self-locking bolts (A).

2. Remove oil input pump and valve assembly (B).

END OF TASK



TA 272352

Section VI. TRANSMISSION ASSEMBLY FROM MAJOR COMPONENTS

2-26 OVERVIEW

a. This section provides maintenance instructions for shop assembly of the transmission from major components.

b. Section V of this chapter provides maintenance instructions for disassembly of the transmission into major components.

c. Maintenance instructions for disassembly, repair, and assembly of major components are provided in Chapter 3.

2-27 PRELIMINARY INSTRUCTIONS

a. Make sure all major components have been properly cleaned, inspected, and repaired as necessary

b. Make sure all mandatory replacement parts (gaskets, seals, packings, etc.) are on hand.

c. Oil all thrust surfaces, mating surfaces, bushings, packings, and bearings immediately before assembly.

INSTALL OIL INPUT PUMP AND INPUT PUMP TUBE ASSEMBLY (CD 850-6A ONLY)

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive torque wrench
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling, P/N 7083778

PRELIMINARY PROCEDURE: Remove Oil Input Pump and Input Pump Tube Assembly (Page 2-50)

NOTE

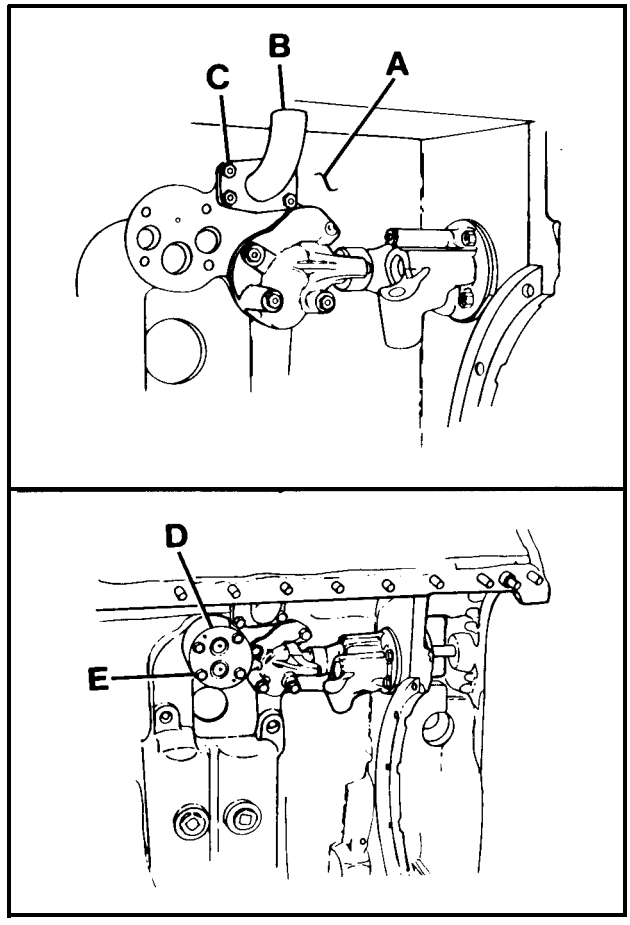
At the beginning of this procedure front housing (A) must be resting on the front flange that connects to the engine. If it is not, the lifting sling must be attached to front housing (A) at this time and the hoist must be used to position front housing (A) on its front flange.

Place metal tube assembly (B) in position and install four self-locking bolts (C).

Using 1/2-inch socket, extension, and torque wrench, tighten four bolts (C) to 17 to 20 lb-ft (23 to 27 N·m).

Place oil input pump (D) in position and install four self-locking bolts (E).

Using 9/16-inch socket, extension, and torque wrench, tighten four bolts (E) to 36 to 43 lb-ft (48 to 58 N·m).



END OF TASK

TA 272391

INSTALL OIL INPUT PUMP AND VALVE ASSEMBLY (CD 850-6A-1 ONLY)

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive torque wrench
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling,
P/N 7083778

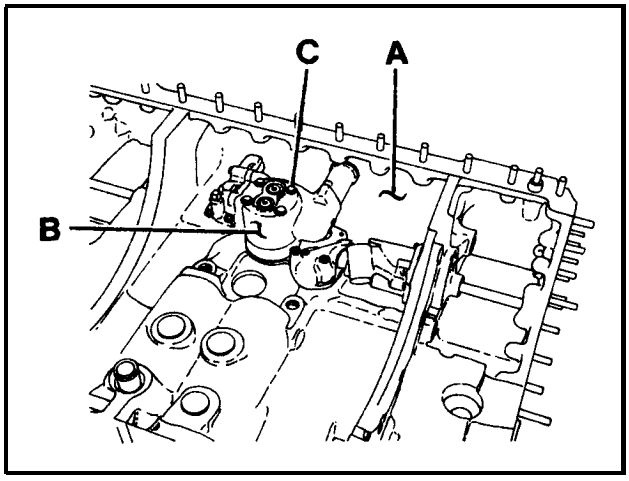
PRELIMINARY PROCEDURE: Remove Oil Input Pump and Valve Assembly (Page 2-51)

NOTE

At the beinning of this procedure front housing (A) must be resting on the front flange that connects to the engine. If it is not, the lifting sling must be attached to front housing (A) at this time and the hoist must be used to position front housing (A) on its front flange.

1. Place oil input pump and valve assembly (B) in position and install four self-locking bolts (C).

2. Using socket, extension, and torque wrench, tighten four bolts (C) to 36 to 43 lb-ft (48 to 58 N·m).



END OF TASK

TA 272353

INSTALL INNER UNIT ASSEMBLY (Sheet 1 of 3)

OVERVIEW

When an inner unit is initially installed during manufacture, castings are ground as necessary to make it seat properly in the front and rear housings. During assembly, if the same inner unit is installed in the same housings, no interference should be encountered, When installing a different inner unit or housing (either new or from another transmission) some grinding may be necessary.

TOOLS: 3/4-in box wrench
3/4-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive ratchet handle
Hoist, 2-ton minimum capacity
1/2-in. drive torque wrench
9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar

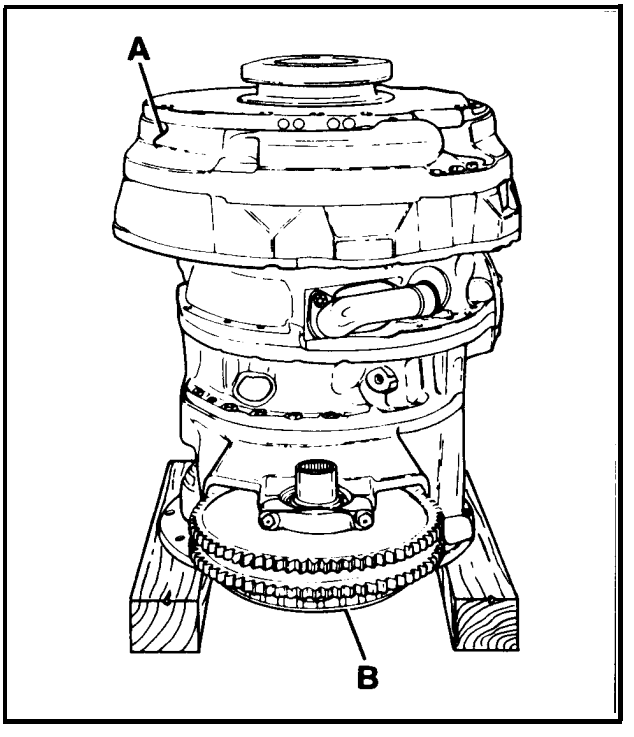
SPECIAL TOOLS: Hoisting adapter, P/N 7081501
Engine sling, P/N 7082787

SUPPLIES: 1/2-20 x 1-1/2-in. bolt (two required)
3/8-16 x 2-1/2-in. bolt (two required)
3/8-24 x 1-3/4-in. bolt (four required)
Wood blocks of various sizes

PRELIMINARY PROCEDURE: Install Oil Input Pump and Input Pump Tube Assembly (CD 850-6A Only, Page 2-53), or Install Oil Input Pump and Valve Assembly (CD 850-6A-1 Only, Page 2-54)

NOTE

If inner unit (A) is resting on bearing (B) end, be sure to use wood blocks to protect bearing (B) when inner unit (A) is being positioned. If a different inner unit (A) is to be installed or if inner unit (A) is to be installed in a different housing, do steps 1 thru 7. If installing the same-inner unit (A) in the same housing, go to step 8.



Go on to Sheet 2.

TA 272354

INSTALL INNER UNIT ASSEMBLY (Sheet 2 of 3)

1. Using hoist, position inner unit (A) so that bevel input gear (C) is downward.

2. Using 9/16-inch socket and breaker bar, remove two existing bolts at location (D) and install the wide end of engine sling (E) at locations (D) with two 3/8-16 x 2-1/ 2 inch bolts.

3. Using 3/4-inch box wrench, install two 1/2-20 x 1-1/2 inch bolts at locations (F).

NOTE

Be sure rear housing (G) is resting securely on wood blocks.

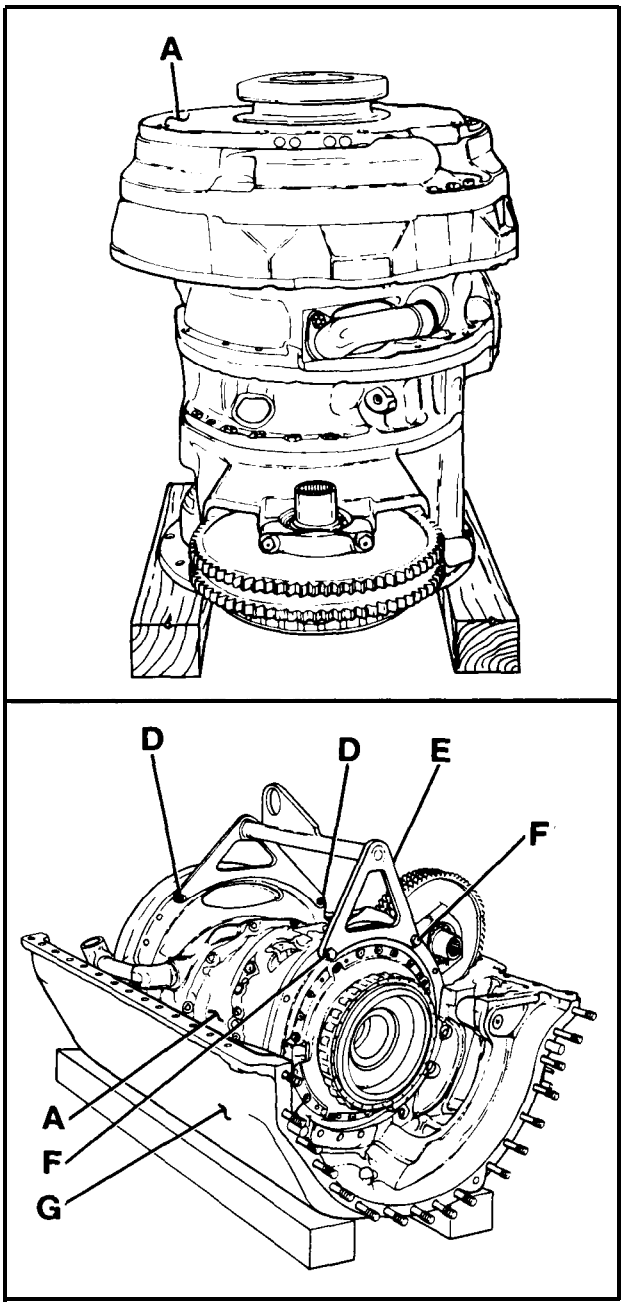
4. Attach engine sling (E) to hoist, raise inner unit (A) and lower it gently into rear housing (G). Aline bolt holes in inner unit flange with holes in web of rear housing (G) check closely for proper seating in rear housing (G). If interference is encountered, grind point of contact sufficiently to allow proper seating.

5. Using hoist, raise inner unit (A) out of housing (G). Set inner unit (A) on clean work surface.

6. Using 9/16-inch socket and ratchet handle, remove two 3/8-16 x 2-1/2 inch bolts from locations (D). Instal the original bolts back into locations (D).

7. Using 3/4-inch box wrench, remove the two 1/2-20 x 1-1/2 inch bolts from locations (F).

Go on to Sheet 3.



TA 272355

INSTALL INNER UNIT ASSEMBLY (Sheet 3 of 3)

8. Position front housing (H) so that it is resting on flange (J).

9. Using 9/16-inch socket and breaker bar, remove four bolts at locations (K) to allow for installation of hoisting adapter (L).

10. Using 9/16-inch socket and ratchet handle, attach hoisting adapter (L) with four 3/8-24 x 1-3/4 inch bolts at locations (K).

11. Attach hoisting adapter (L) to hoist. Using hoist, raise inner unit (A) and gently lower it into front housing (H). If interference prevents inner unit (A) from seating properly, grind point of contact of housing (H) sufficiently to allow proper seating.

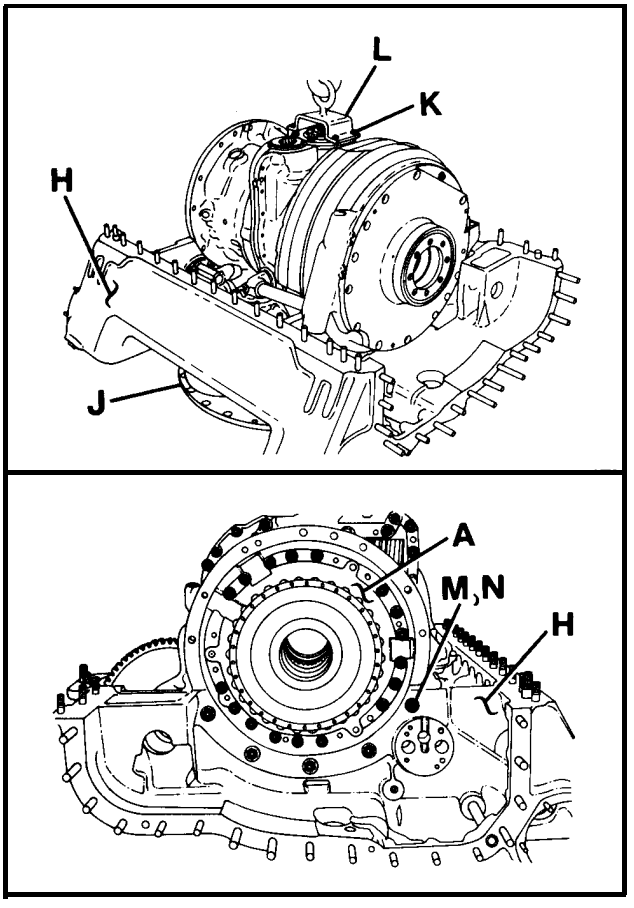
12. Using 3/4-inch socket, extension, and ratchet handle, install five flat washers (M) and self-locking bolts (N) that attach inner unit (A) to front housing (H).

13. Tighten five bolts (N) to seat inner unit (A) in front housing (H) and then loosen bolts (N) one full turn.

14. Using 9/16-inch socket and ratchet handle, remove four bolts from locations (K). Remove hoisting adapter (L).

15. Install original four 3/8-24 x 1-1/4 inch bolts at locations (K). Torque bolts at locations (K) to 41-49 lb-ft (56 to 66 N*m).

END OF TASK



TA 272356

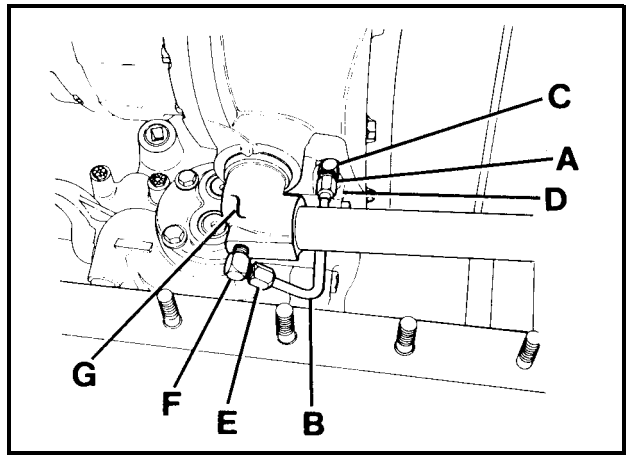
INSTALL OIL PRESSURE REGULATOR TUBE ASSEMBLY (CD 850-6A-1 ONLY)

TOOLS: 9/16-in. line wrench

PRELIMINARY PROCEDURE: Install Inner Unit Assembly (Page 2-55).

1. Connect nut (A) of oil tube (B) to elbow fitting (C) on oil input pump (D).
2. Connect nut (E) of oil tube (B) to elbow fitting (F) on elbow assembly (G).
3. Using wrench, tighten nuts (A) and (E) sufficiently to prevent leakage.

END OF TASK



TA 272357

INSTALL REAR MECHANICAL HOUSING (Sheet 1 of 3)

TOOLS: 3/8 to 1/2-in. adapter
3/4-in. box wrench
3/4-in. 1/2-in. drive socket
1/2-in. drive 10-in. long extension
1/2-in drive torque wrench
Hoist, 2-ton minimum capacity
1/2-in. drive ratchet handle
3/8-in. drive 3/4-in. crowfoot attachment

SPECIAL TOOLS: Lifting sling, P/N 7083778
Mechanical puller adapter, P/N 7083673

SUPPLIES: Linen thread
Splitline sealer
1/2-in. stiff bristle brush

PRELIMINARY PROCEDURE: Install Inner Unit Assembly (CD 850-6A Only, Page 2-55) or Install Oil Pressure Regulator Tube Assembly (CD 850-6A-1 Only, Page 2-58).

1. Using brush, apply moderate coat of splitline sealer (item 16, Appendix C) to surfaces (A) and (B).

2. Place linen thread (C) (item 17, Appendix C) along surface (B). Place thread (C) between the inside edge of the splitline and studs (D). Allow 1 to 2 inches of thread to extend past the ends of front housing (E).

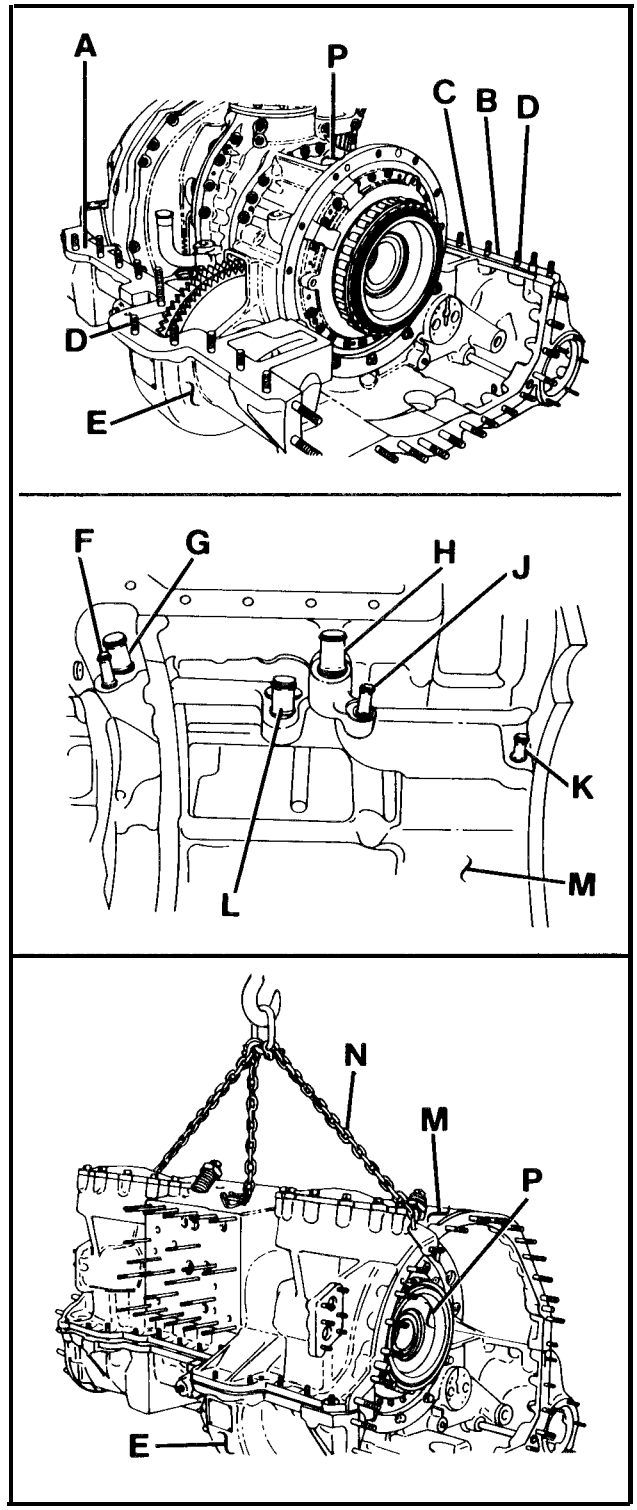
3. Check two preformed packings on each of six oil tubes (F), (G), (H), (J), (K), and (L) to assure that they are in place in rear housing (M). Apply oil to each preformed packing.

4. Attach lifting sling (N) to rear housing (M) and suspend from hoist.

5. Position rear housing (M) over inner unit (P) and lower it into place.

6. Remove lifting sling (N) from rear housing (M).

Go on to Sheet 2.



TA 272358

INSTALL REAR MECHANICAL HOUSING (Sheet 2 of 3)

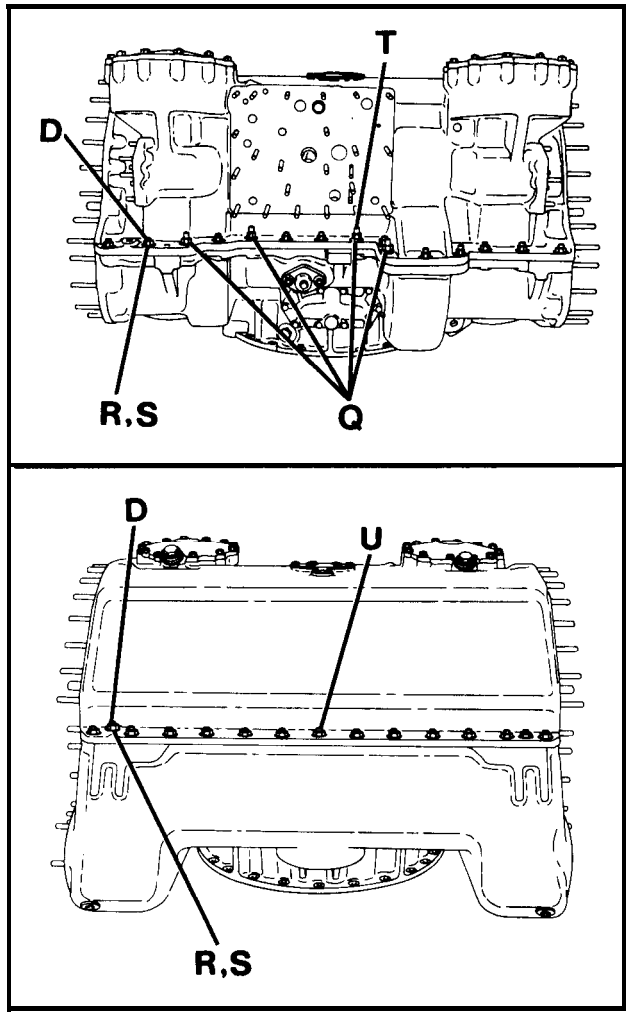
7. Manually install four spacers, lock-washers, and plain, hexagon nuts at locations (Q).

8. Manually install 26 plain washers (R) and nuts (S) on to studs (D).

9. Using socket and torque wrench (and adapter and crow foot attachment as necessary), starting with center stud (T) and alternately working toward each end, draw 15 nuts down snug. Do not exceed 30 lb-ft (41 N•m). Do the same with the remaining 15 nuts starting with center stud (U).

10. Tighten 30 splitline nuts (S) to 67 to 80 lb-ft (91 to 108 N•m).

Go on to Sheet 3



TA 272359

INSTALL REAR MECHANICAL HOUSING (Sheet 3 of 3)

11. Install rear housing dowel pin (V) into rear housing (M).

12. Thread mechanical puller adapter (W) into dowel pin (V). Using box wrench, tighten adapter (W).

13. Thread attachment puller (X) into adapter (W). Work attachment puller (X) to gently tap dowel pin (V) into place. Pin (V) should be flush with surface Using box wrench, remove puller (X) and adapter (W).

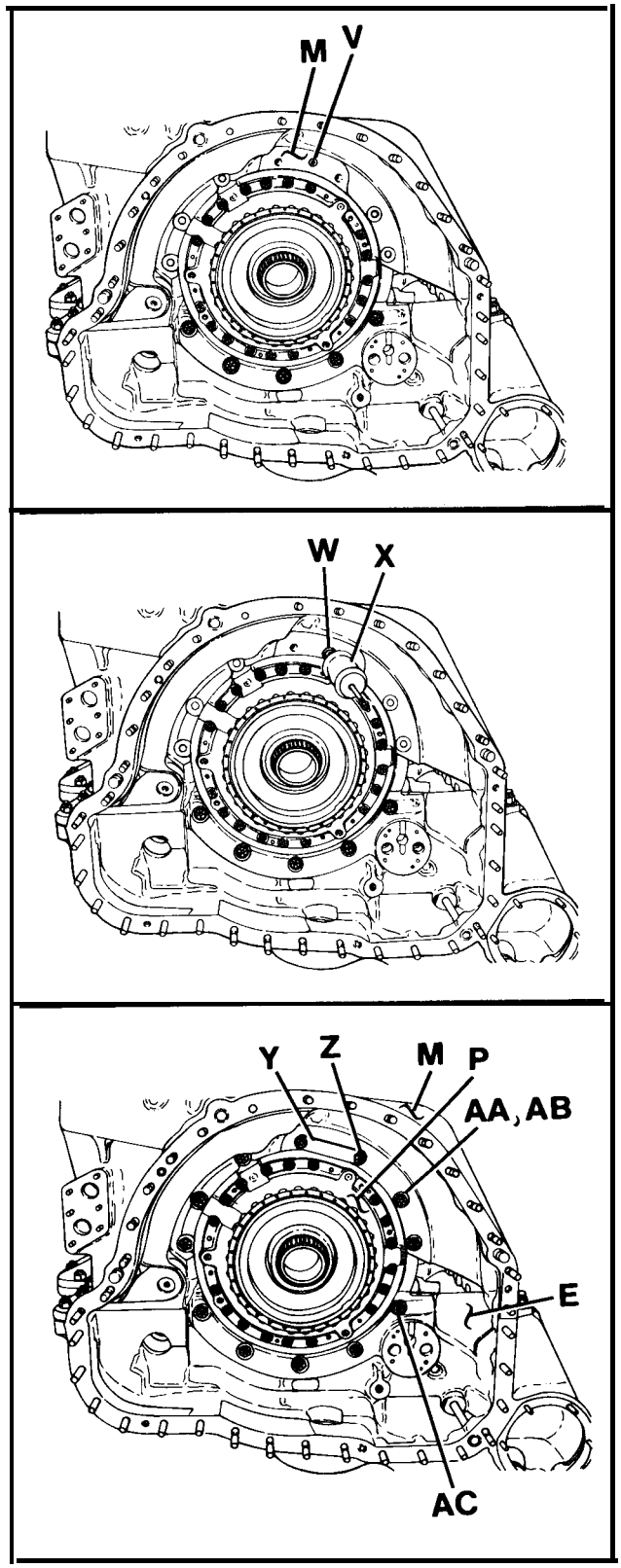
14. Using socket, extension, and handle, install dowel pin locking plate (Y) with two self-locking bolts (Z).

15. Using socket, extension, and handle, install five self-locking bolts (AA) and flat washers (AB).

16. Tight en seven bolts (Z, AA) to seat inner unit (P) in rear housing (M) and then loosen bolts (Z, AA) one full turn.

17. Using socket, extension, and torque wrench, tighten all 12 bolts (Z, AA, AC) that attach inner unit (P) to front housing (E) and rear housing (M) to 96 to 115 lb-ft (130 to 156 N·m).

END OF TASK



TA 272360

INSTALL LOW-RANGE DRUM, BRAKE BAND ASSEMBLY (LOW-RANGE BAND ASSEMBLY), AND TORQUE CONVERTER OUTPUT SHAFT (Sheet 1 of 2)

TOOLS: 3/8-in. drive 5/32-in. hex key socket (short)
Plastic insert hammer
Machinist's hammer
Center punch
3/8-in. drive torque wrench

SUPPLIES: Container suitable for soaking band assembly.

PRELIMINARY PROCEDURE: Install Rear Mechanical Housing (Page 2-59).

1. Soak low-range band (A) in transmission oil (item 4 or 6, Appendix C) in container for two hours (minimum) before assembly.

2. Insert double-splined end of converter output shaft (B) into right end of inner unit (C). Work shaft (B) through inner unit (C) until first spline extends from left end.

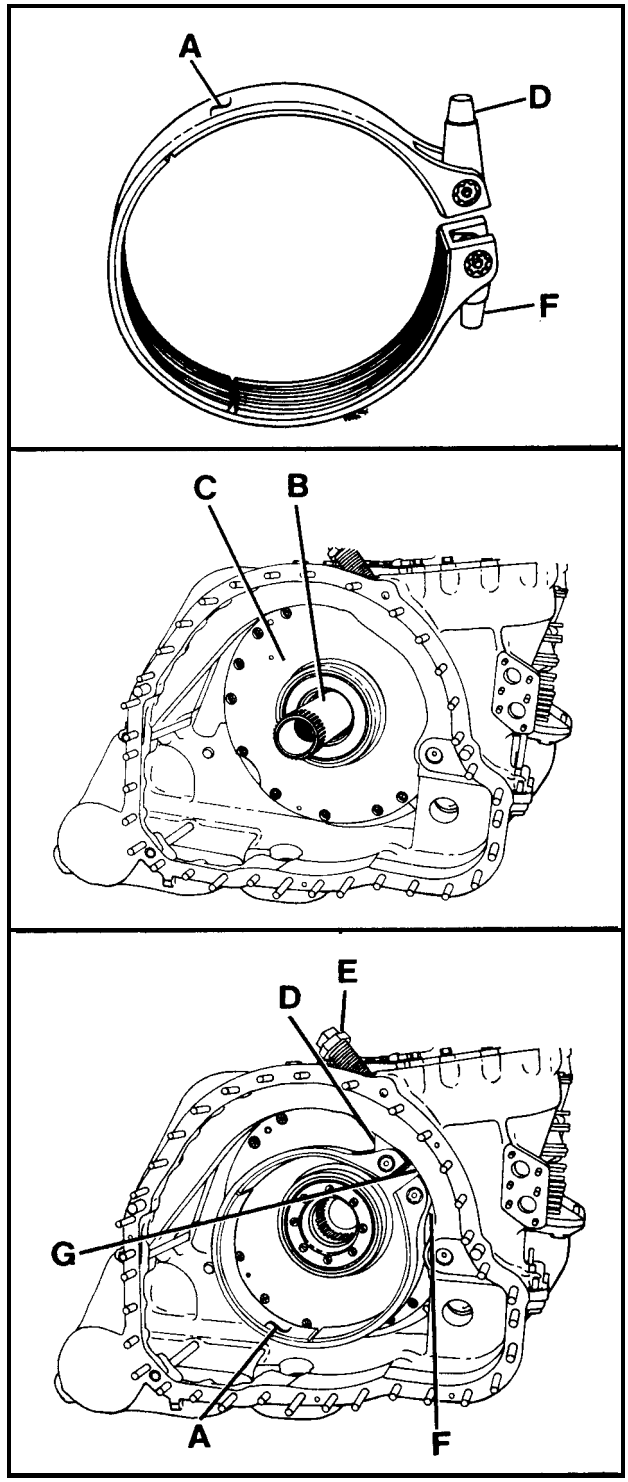
3. Place low-range band (A) so that anchor strut (D) is nested in socket of low-range band adjustment screw (E).

NOTE

Apply strut (F) is the pointed one.

4. Move band as necessary to seat apply strut (F) in socket of servo actuating lever (G).

Goon to Sheet 2.



TA 272361

INSTALL LOW-RANGE DRUM, BRAKE BAND ASSEMBLY (LOW-RANGE BAND ASSEMBLY), AND TORQUE CONVERTER OUTPUT SHAFT (Sheet 2 of 2)

5. Hold band (A) in position while manually tightening band adjustment screw (E) sufficiently to hold struts in sockets.

6. Using petrolatum (item 13, Appendix C), lubricate two hook-type seal rings (G) and install them on low-range drum (H).

7. Insatall low-range drum (H). Gently tap drum (H) with plastic insert hammer, working all around, until it is properly seated.

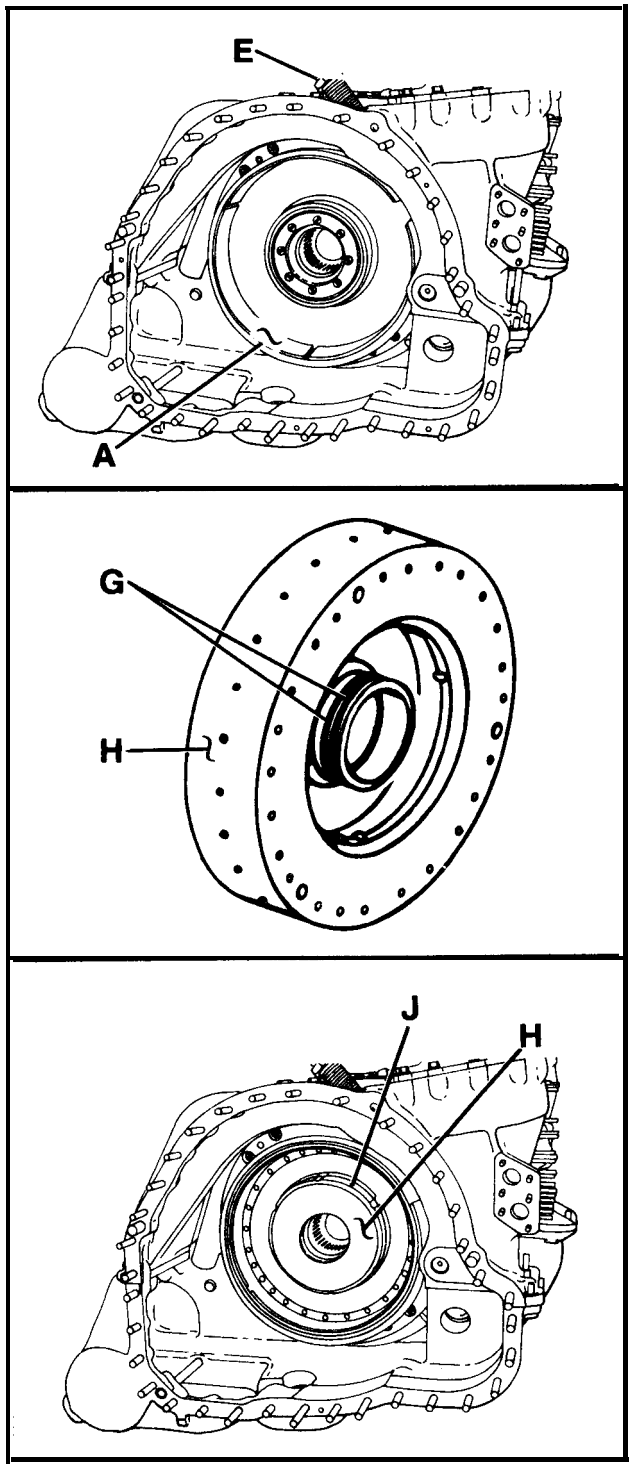
8. Install three setscrews (J) 120 degrees apart in drum (H). Using hex key wrench, tighten setscrews (J) to 72 to 96 lb-in. (7 to 11 N·m).

CAUTION

To prevent interference or damage to the piston, make sure you do not cause burrs or high spots on drum (H) when staking setscrews (J).

9. Using punch and machinist's hammer stake three setscrews (J) in tapped holes.

END OF TASK



TA 272362

INTALL LOW-RANGE INTERNAL GEAR, CLUTCH DISK (HIGH-RANGE CLUTCH COVER PLATE). CLUTCH DISKS (HIGH-RANGE CLUTCH PLATES), AND PRESSURE PLATE
(Sheet 1 of 3)

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive torque wrench
Pry bar

PERSONNEL: Two persons recommended

PRELIMINARY PROCEDURE: Install Low-Range Drum, Brake Band Assembly (Low-Range Band Assembly), and Torque Converter Output Shaft (Page 2-62)

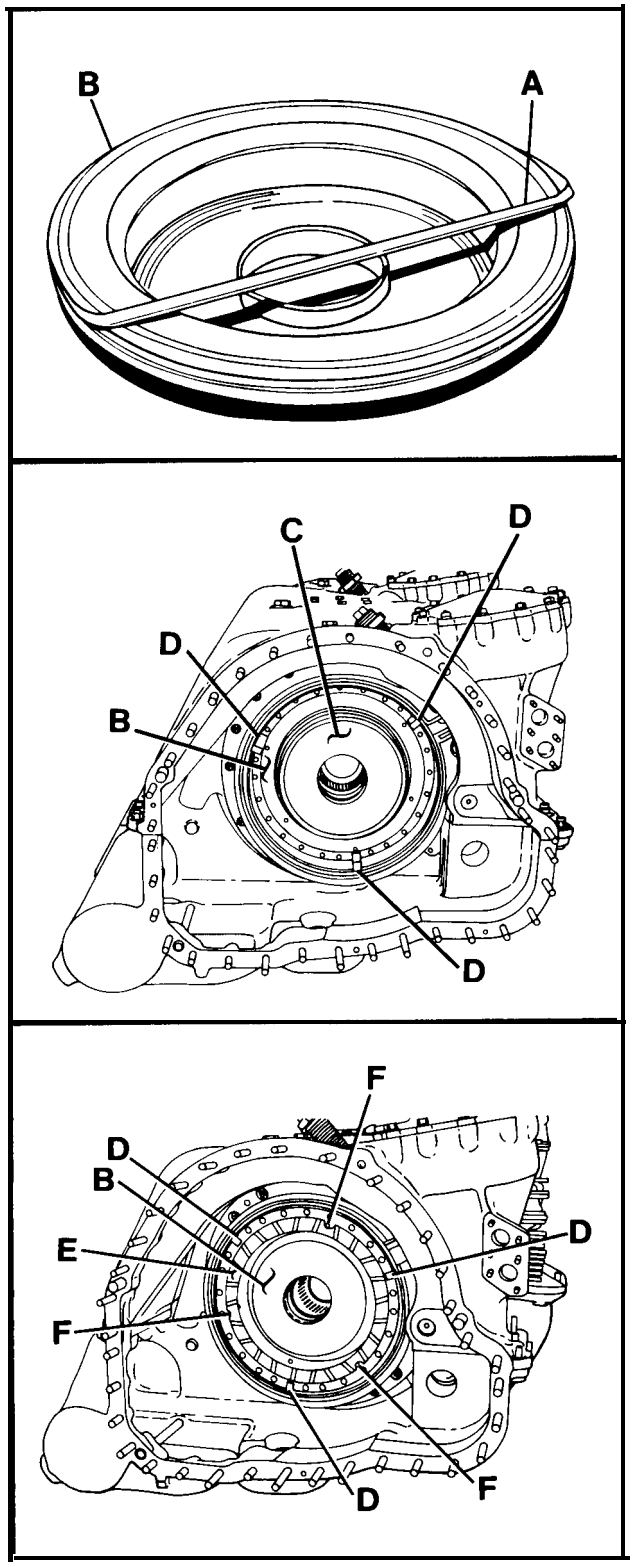
1. Lubricate rubber seal (A) with transmission oil and install on transmission clutch piston (high-range clutch piston) (B).

2. Install piston (B) on drum (C).

3. Install three machine keys (clutch plate drive keys) (D).

4. Line up high-range clutch inner pressure plate (E) with three keys (D) and install plate (E) with smooth side toward piston (B). Rotate piston (B) and aline three dowel pins F on piston (B) with holes in plate (E).

Go on to Sheet 2.



TA 272363

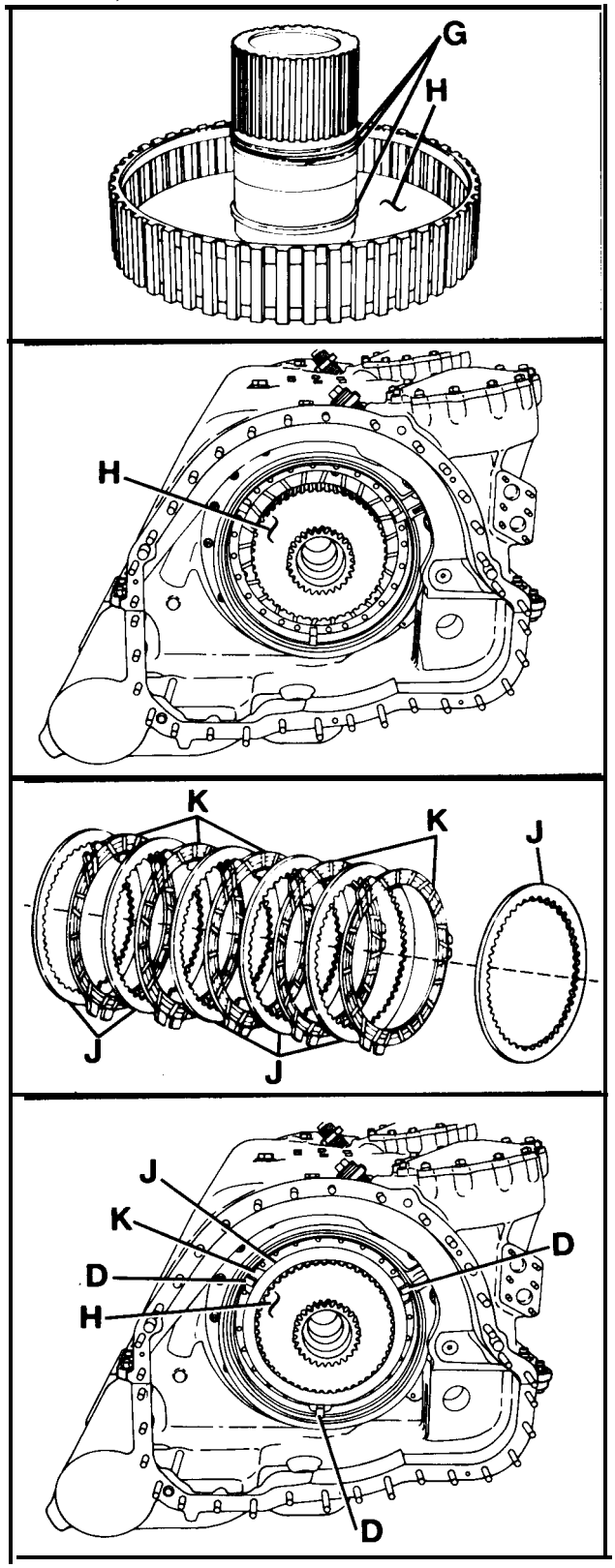
INSTALL LOW-RANGE INTERNAL GEAR, CLUTCH DISK (HIGH-RANGE CLUTCH COVER PLATE), CLUTCH DISKS (HIGH-RANGE CLUTCH PLATES), AND PRESSURE PLATE (Sheet 2 of 3)

5. Oil three metal seal rings (G) with transmission oil and install rings (G) on spur gear (high-range clutch hub) (H).

6. Install hub (H).

7. Install 11 clutch disks (high-rage clutch plates) as follows: Starting with one internal-splined clutch plate (J), install it on high-range hub (H). Next, install an external-tanged clutch plate (K) on three clutch plate drive keys (D). Alternately install other five internal-splined plates (J) and four external-tanged plates (K).

Go on to Sheet 3.



TA 272364

INSTALL LOW-RANGE INTERNAL GEAR, CLUTCH DISK (HIGH-RANGE CLUTCH COVER PLATE), CLUTCH DISKS (HIGH-RANGE CLUTCH PLATES), AND PRESSURE PLATE (Sheet 3 of 3)

8. Assembly low-range ring gear (L), 24 bolts (M), high-range cover plate (N), high-range clutch outer pressure plate (P), and 24 clutch release springs (Q). Be sure gear (L) dowels match up with cover plate (N) dowel holes.

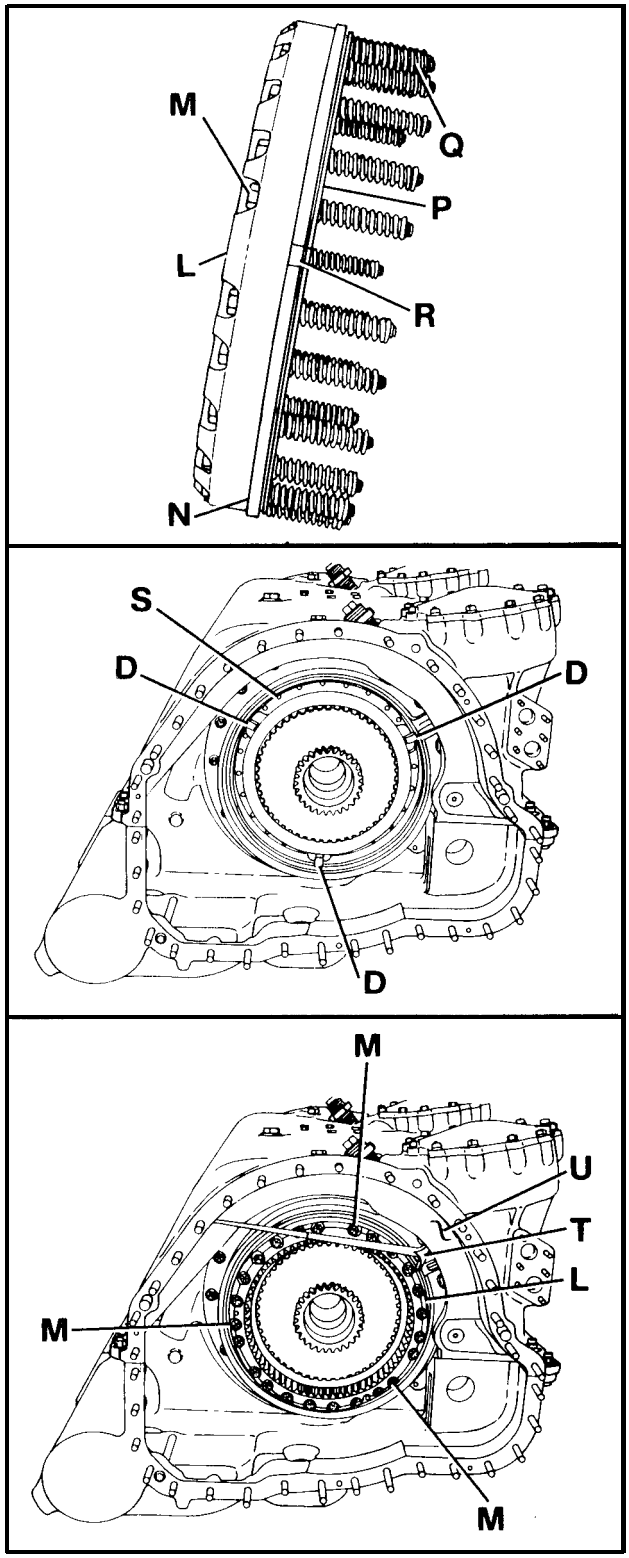
9. Position parts assembled in step 8 so that key slots (R) in high-range clutch outer pressure plate (P) are alined with three clutch plate drive keys (D).

10. Thread 24 bolts (M) into threaded holes in low-range drum (S).

11. Place pry bar (T) between ring gear (L) and rear housing (U) to prevent ring gear (L) from turning.

12. Using socket, extension, and torque wrench, tighten three bolts (M), 120 degrees apart, evenly to 36 to 43 lb-ft (48 to 58 N·m). Tighten remaining 21 bolts (M) to 36 to 43 lb-ft (48 to 58 N·m).

END OF TASK



TA 272392

INSTALL BRAKE BAND ASSEMBLY (REVERSE-GEAR BAND ASSEMBLY), REVERSE SUN GEAR ASSEMBLY, AND MAIN SHAFT ASSEMBLY (MAIN CROSS-DRIVE SHAFT ASSEMBLY) (Sheet 1 of 2)

TOOLS: Machinist's hammer
Center punch
Arbor press

PRELIMINARY PROCEDURE: Install Low-Range Internal Gear, Clutch Disk (High-Range Clutch Cover Plate), Clutch Disks (High-Range Clutch Plates), and Pressure Plate (Page 2-64)

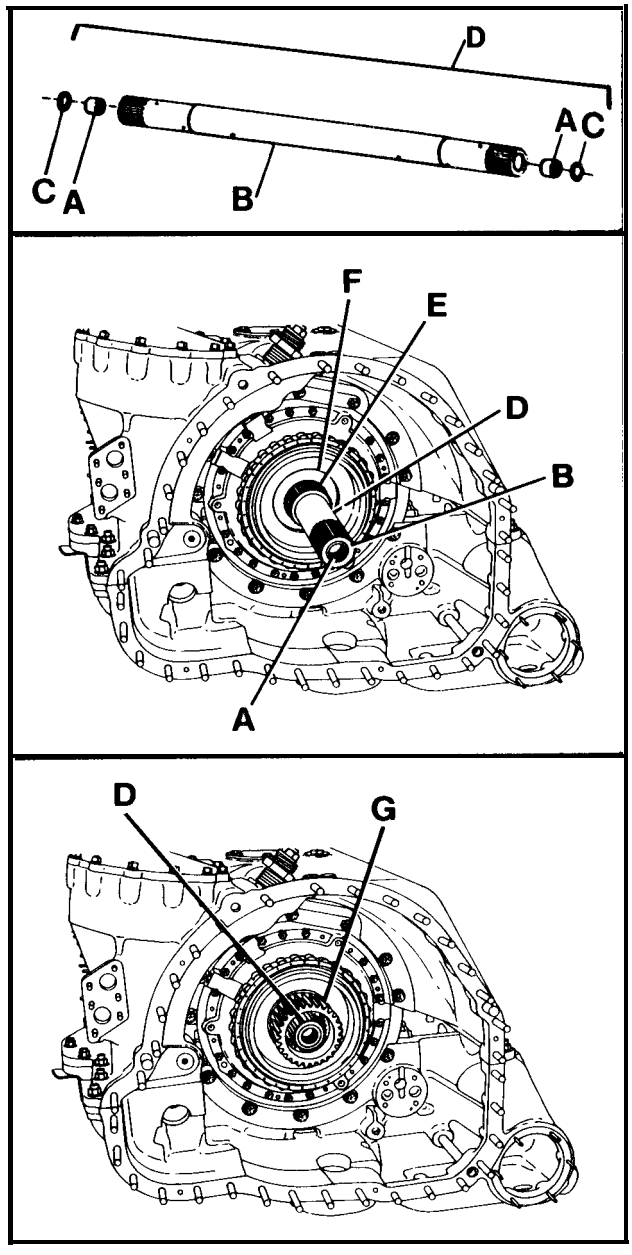
1. If removed, using arbor press, install needle roller bearings (A) to a seat in shaft (B). Install shims (C). Using hammer and punch, stake shims (C) to shaft (B) at six equally spaced locations

2. Insert main shaft assembly (D) through the center of converter output shaft (E) from the right end.

3. Apply a light coat of petrolatum and install thrust washer bearing (F). Make sure bearing (F) indexes with the pocket in the left steer housing.

4. Install reverse sun gear assembly (G).

Go on to Sheet 2.



TA 272365

INSTALL BRAKE BAND ASSEMBLY (REVERSE-GEAR BAND ASSEMBLY), REVERSE SUN GEAR ASSEMBLY, AND MAIN SHAFT ASSEMBLY (MAIN CROSS-DRIVE SHAFT ASSEMBLY) (Sheet 2 of 2)

NOTE

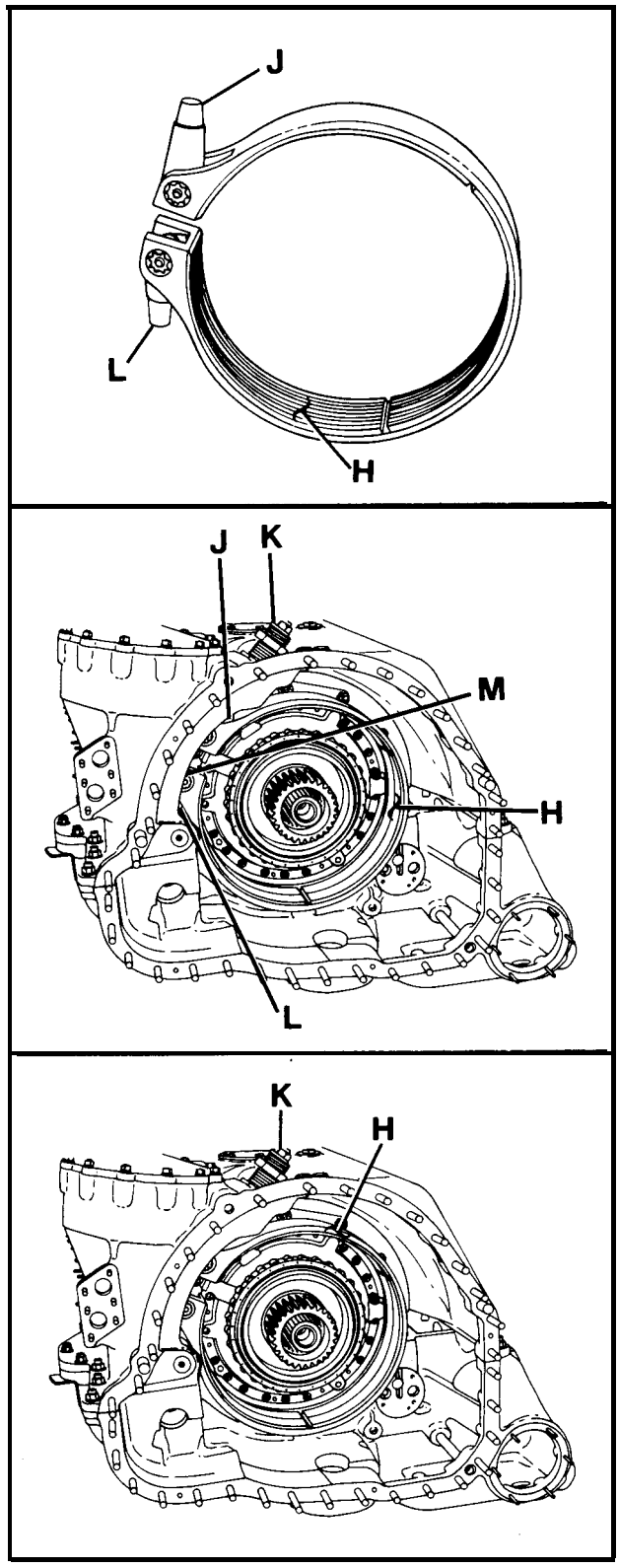
Soak reverse gear band assembly (H) in transmission oil (item 4 or 6, Appendix C) for two hours (minimum) before assembly.

5. Position reverse gear band (H) so that anchor strut (blunt end) (J) is nested in socket of reverse-range band adjusting screw (K).

6. Move band (H) as necessary to seat apply strut (L) in socket of servo actuating lever (M).

7. Hold band (H) in position and tighten band adjusting screw (K) sufficiently to hold struts (J, L) in sockets.

END OF TASK



TA 272366

INSTALL REVERSE-RANGE CARRIER ASSEMBLY

TOOLS: None

PERSONNEL: Two persons recommended

SUPPLIES: A block of wood (2 x 4 in.)

PRELIMINARY PROCEDURE: Install Brake Band Assembly (Reverse-Gear Band Assembly), Reverse Sun Gear Assembly, and Main Shaft Assembly (Main Cross-Drive Shaft Assembly) (Page 2-68)

1. Apply petrolatum (item 13, Appendix C) to both faces of thrust washer bearing (A).

2. Install thrust washer bearing (A) on back side of reverse-range carrier assembly (B).

CAUTION

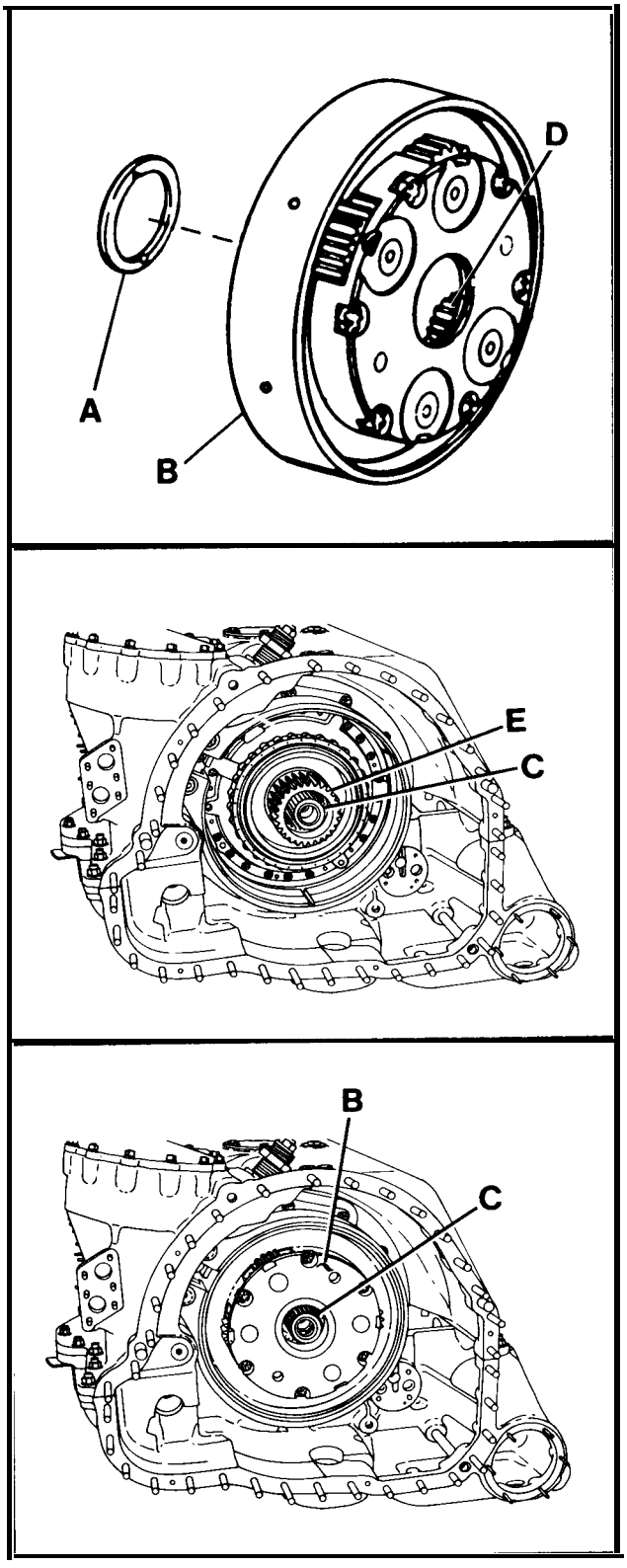
Make sure you do not push main shaft assembly (C) through inner unit assembly.

3. Install reverse-range carrier assembly (B) onto the inner unit left end, engaging pinion teeth (D) with those of reverse range sun gear (E).

NOTE

A 2 x 4 piece of wood may be helpful in supporting weight of carrier assemby (B) while it is being lined up with sun gear (E).

END OF TASK



TA 272367

INSTALL LEFT OUTPUT INTERNAL GEARS, REVERSE AND OUTPUT GEAR HUB ASSEMBLY, OIL OUTPUT PUMP, OIL OUTPUT PUMP DRIVE GEAR, AND SHORT STEER SHAFT
(Sheet 1 of 2)

TOOLS: 3/4-in. 1/2-in. drive socket
5/8-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive torque wrench
Pry bar
Plastic insert hammer
9/16-in. 1/2-in. drive socket
External retaining ring pliers

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Install Reverse-Range Carrier Assembly (Page 2-69)

1. Install thrust washer bearing (A) on hub assembly (B).

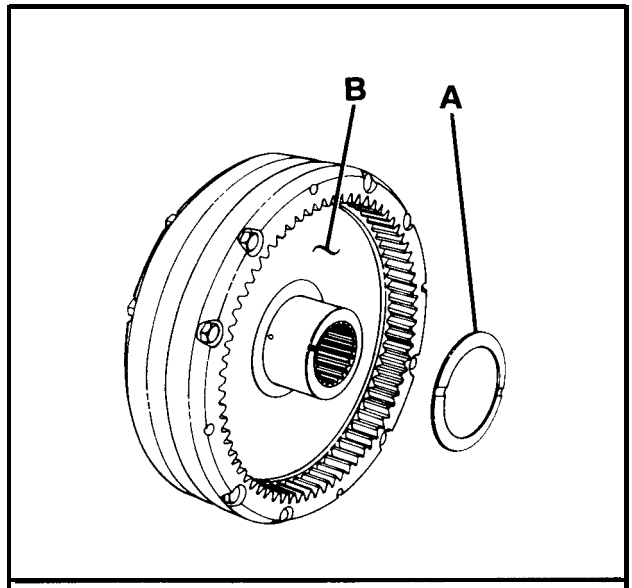
CAUTION

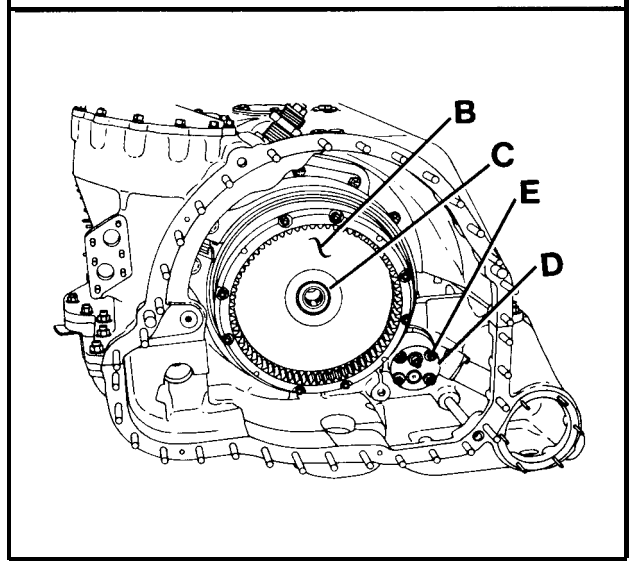
Make sure you do not push main shaft assembly (C) through inner unit assembly or allow high-range clutch hub to disengage clutch plates.

2. Have one person install internal gears and hub assembly (B) on main shift assembly (C) while other person, using hammer, taps main shaft assembly (C) from other side until shaft (C) is flush with hub assembly (B).

3. Place oil output pump assembly (D) in position and install four self-locking bolts (E).

4. Using 9/16-inch socket, extension, and torque wrench, tighten four bolts (E) to 36 to 43 lb-ft (48 to 58 N·m).





TA 272368

Go on to Sheet 2.

INSTALL LEFT OUTPUT INTERNAL GEARS, REVERSE AND OUTPUT GEAR HUB ASSEMBLY OIL OUTPUT PUMP, OIL OUTPUT PUMP DRIVE GEAR, AND SHORT STEER SHAFT
(Sheet 2 of 2)

NOTE

(CD 850-6A1 Only) Be sure Woodruff key is in place on oil pump shaft (F) before installing output oil pump drive gear (G).

5. Install output oil pump drive gear (G) on pump shaft (F).

6. Install self-locking nut (H) on oil output pump shaft (F) while holding gear stationary with pry bar (J).

7. (CD 850-6A only). Using 5/8-inch socket, extension, and torque wrench, tighten nut (H) to 30 lb-ft (4 N·m).

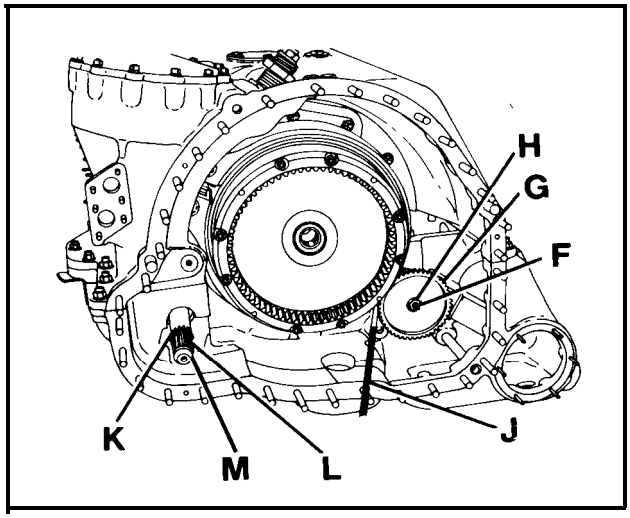
8. (CD 850-6A1 Only). Using 3/4-inch socket, extension, and torque wrench, tighten nut (H) to 30 lb-ft (4 N·m).

NOTE

If either retaining ring (K) located at each end of shaft (L) is damaged, replace it using retaining ring pliers.

9. Install, to a seat, short steer shaft (L) into left end of transmission with tapered end (M) toward the outside.

END OF TASK



TA 272369

INSTALL LEFT END COVER ASSEIMBLY (Sheet 1 of 3)

TOOLS: 9/16-in. box wrench
3/4-in. 1/2-in. drive deep well socket
1/2-in. drive 5-in. long extension
1/2-in. drive torque wrench
Flat-tip screwdriver
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: End cover lifting bracket, P/N 11650103

SUPPLIES: 3/8-24 x 3-3/4-in. bolt (two required)
Linen thread
Splitline sealer
1/2-in. stiff bristle brush

PRELIMINARY PROCEDURE: Install Left-Output Internal Gears, Reverse and Output Gear Hub Assembly, Oil Output Pump, Oil Output Pump Drive Gear, and Short Steer Shaft (Page 2-70)

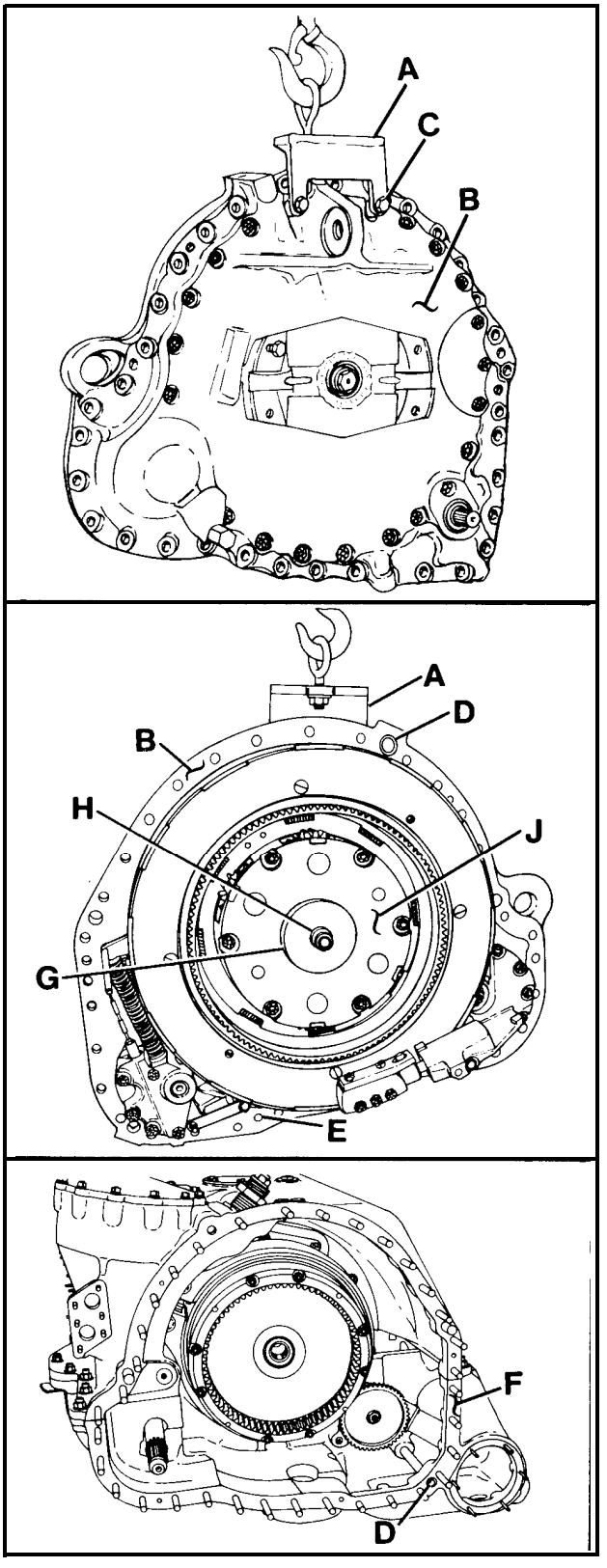
1. If lifting bracket (A) is not already attached, using box wrench, attach it to end cover assembly (B) with two 3/8-24 bolts (C). Tighten bolts (C).

2. Attach hoist to lifting bracket (A) and take up all slack.

3. Inspect left end cover assembly (B) interface to see whether three performed packings (D) and (E) are missing from left end cover assembly (B) or from front housing (F). If packings are missing, apply light coat of petrolatum (item 13, Appendix C) on new packings (D, E) and install them.

4. Check that thrust washer (G) and seal ring (H) are in place on hub of output carrier (J).

Go on to Sheet 2.



TA 272370

INSTALL LEFT END COVER ASSEMBLY (Sheet 2 of 3)

CAUTION

Make sure you do not cause a buildup of sealer near oil passage ports (K) in the splitline.

5. Apply a moderate coat of sealer (item 16, Appendix C) to splitline surfaces on front housing (F) and rear housing (L) and to the mating surface on end cover assembly (B).

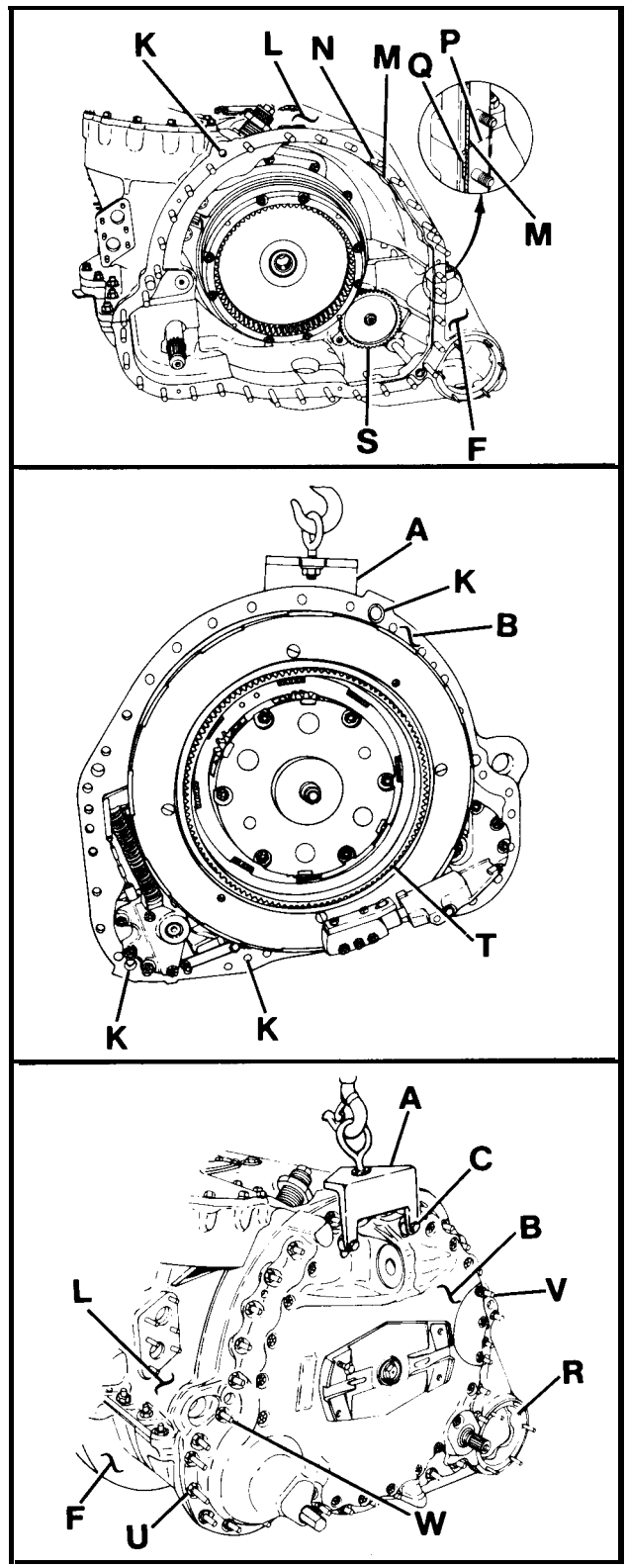
6. Place linen thread (M) (item 17, Appendix C) as shown. Lay thread (M) to sixth studs (N) from bottom splitline (P). Lay thread (M) between the inside edge of the splitline and the studs and around the outside of oil passage (K). Place end of bottom splitline thread (Q) toward front of housing.

7. Attach hoist to lifting bracket (A). Raise hoist and move end cover assembly (B) into position.

8. Carefully aline components in end cover assembly (B) with components in transmission while moving into position so studs (N) on front housing (F) and rear housing (L) protrude through end cover assembly (B). Reach through side oil tube assembly hole (R) to index oil pump drive gear (S) with output carrier ring (T).

9. Install 32 nuts (U) manually. Using 3/4-inch socket, extension, and torque wrench, tighten 32 nuts (U) as follows: Starting with studs (V) and (W), tighten nuts (U) alternately until splitlines are drawn together all way around. Tighten all nuts (U) to 67 to 80 lb-ft (91 to 109 N·m).

Go on to sheet 3.



TA 272371

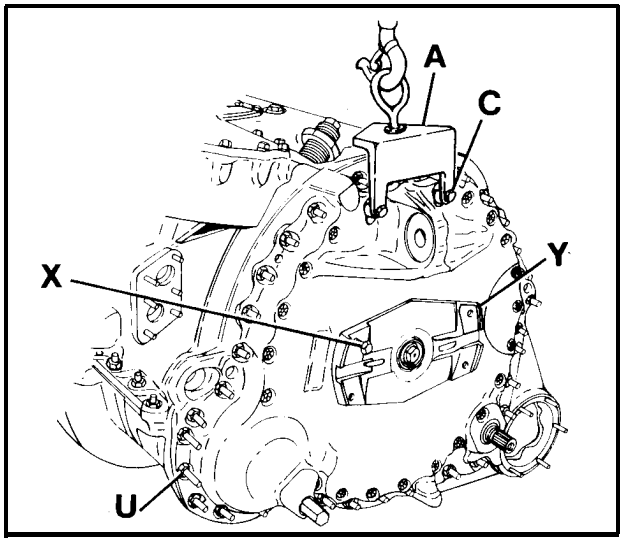
INSTALL LEFT END COVER ASSEMBLY (Sheet 3 of 3)

10. Using box wrench, remove two bolts (C) attaching lifting bracket (A). Remove lifting bracket (A).

11. Using socket, extension, and torque wrench install two bolts in holes where bolts (C) were removed. Tighten to 41 to 49 lb-ft (56 to 66 N·m).

12. Using socket, extension, and torque wrench, install remaining two nuts (U) in locations that were not accessible in Step 9. Tighten the two nuts (U) to 67 to 80 lb-ft (91 to 109 N·m).

13. Remove bolt (X) that was install in one of the holes in thrust washer bearing (output flange) (Y) during disassembly.



END OF TASK

TA 272385

INSTALL LOW-RANGE CARRIER ASSEMBLY, RIGHT OUTPUT INTERNAL GEAR AND HUB ASSEMBLY, AND LONG STEER SHAFT

TOOLS: External retaining ring pliers

PRELIMINARY PROCEDURE: Install Left End Cover Assembly (Page 2-72)

1. Install thrust washer bearing (A) onto hub of low-range carrier and ring gear assembly (B).

CAUTION

Make sure you do not push main shaft assembly (C) through inner unit.

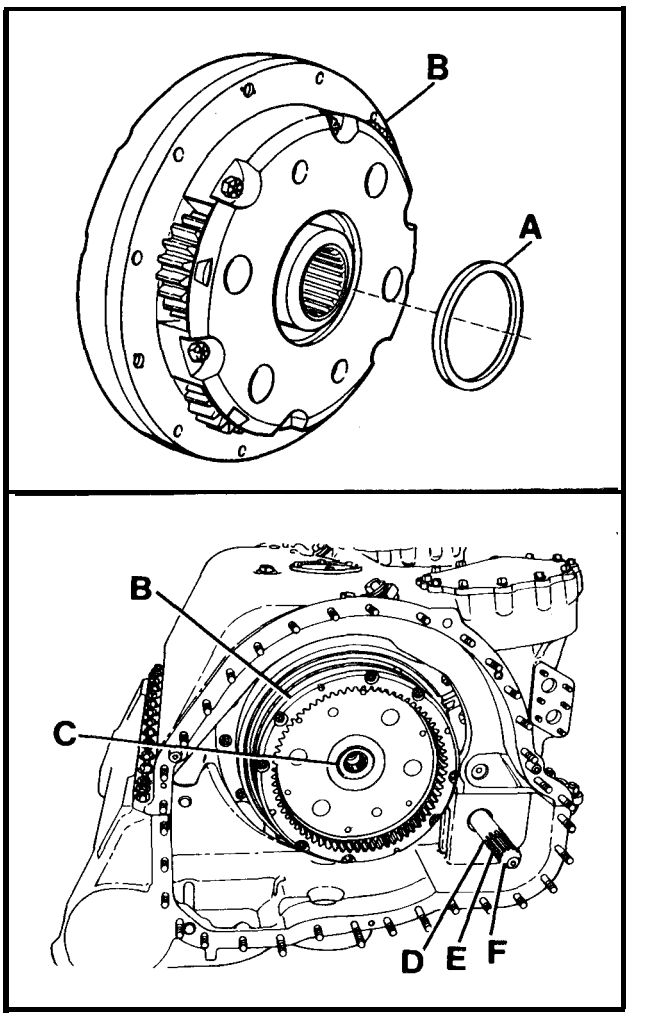
2. Install low-range carrier and ring gear assembly (B) on main shaft assembly (C).

NOTE

If either of retaining rings (D) located at each end of shaft (E) is damaged, replace it using retaining ring pliers.

3. Install to a seat, long steer shaft (E) into right end of transmission, tapered end (F) toward the outside.

END OF TASK



TA 272372

INSTALL RIGHT END COVER ASSEMBLY (Sheet 1 of 2)

TOOLS: 9/16-in. box wrench
3/4-in. 1/2-in. drive deep well socket
1/2-in. drive 5-in. long extension
1/2-in. drive torque wrench
Hoist, 2-ton minimum capacity
9/16-in. 1/2-in. drive socket

SPECIAL TOOLS: End Cover lifting bracket, P/N 11650103

SUPPLIES: 3/8-24 x 3-3/4 in. bolt (two required)
Linen thread
Splitline sealer
1/2-in. stiff bristle brush

PRELIMINARY PROCEDURE: Install Low-Range Carrier Assembly, Right-Output Internal Gear and Hub Assembly, and Long Steer Shaft (Page 2-75).

1. If not attach, install lifting bracket (A) on end cover assembly (B) with two 3/8-24 bolts (C). Using box wrench, tighten two bolts (C).

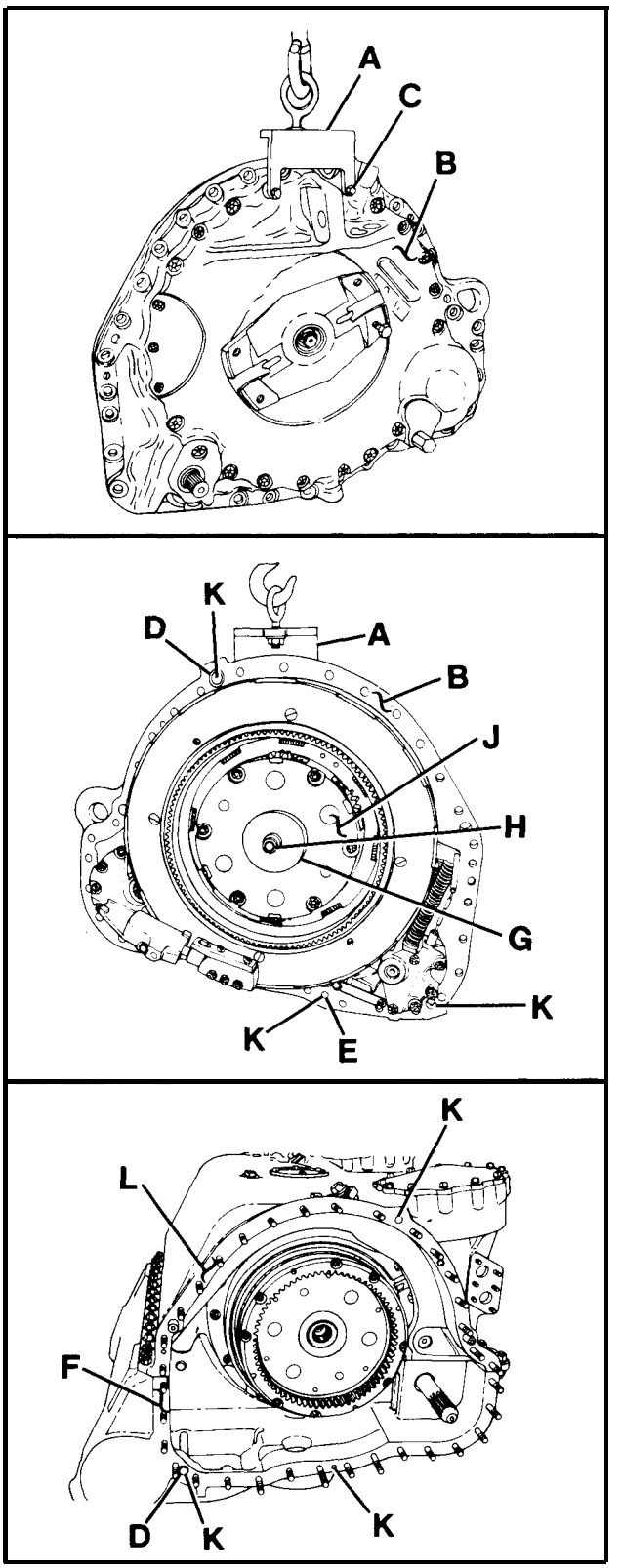
2. Inspect interface of right end cover assembly (B) to see whether three preformed packings (D) and (E) are missing from right end cover assembly (B) or from front housing (F). If packings are missing, apply light coat of petrolatum (item 13, Appendix C) on new packings (D, E) and install them.

3. Check that thrust washer (G) and seal ring (H) are in place on hub of output carrier (J).

CAUTION

Make sure you do not cause a buildup of sealer near oil passage ports (K) in the splitline.

4. Apply moderate coat of sealer (item 16, Appendix C) to splitline surfaces on end cover assembly (B) and to mating surfaces on front housing (F) and rear housing (L).



TA 272373

Go on to Sheet 2.

INSTALL RIGHT END COVER ASSEMBLY (Sheet 2 of 2)

5. Place linen thread (M) (item 17, Appendix C) as shown. Lay thread (M) to sixth studs (N) from bottom splitline (P). Lay thread (M) between the inside edge of the splitline and the studs and around the outside of oil passage (K). Place end of bottom splitline thread (Q) toward the front of housing.

6. Attach hoist to lifting bracket (A). Raise hoist and move end cover (B) into assembly position

7. Carefully aline components in end cover (B) with components in transmission while moving into position so studs (N) on front housing (F) and rear housing (L) protrude through end cover assembly (B).

8. Install 32 nuts(R) manually. Using 3/4-inch socket, extension, and torque wrench, tighten 32 nuts (R) as follows Starting with studs (S and T), tighten nuts (R) alternately until splitlines are drawn together all way around. Tighten all nuts(R) to 67 to 80 lb-ft (91 to 109 N·m).

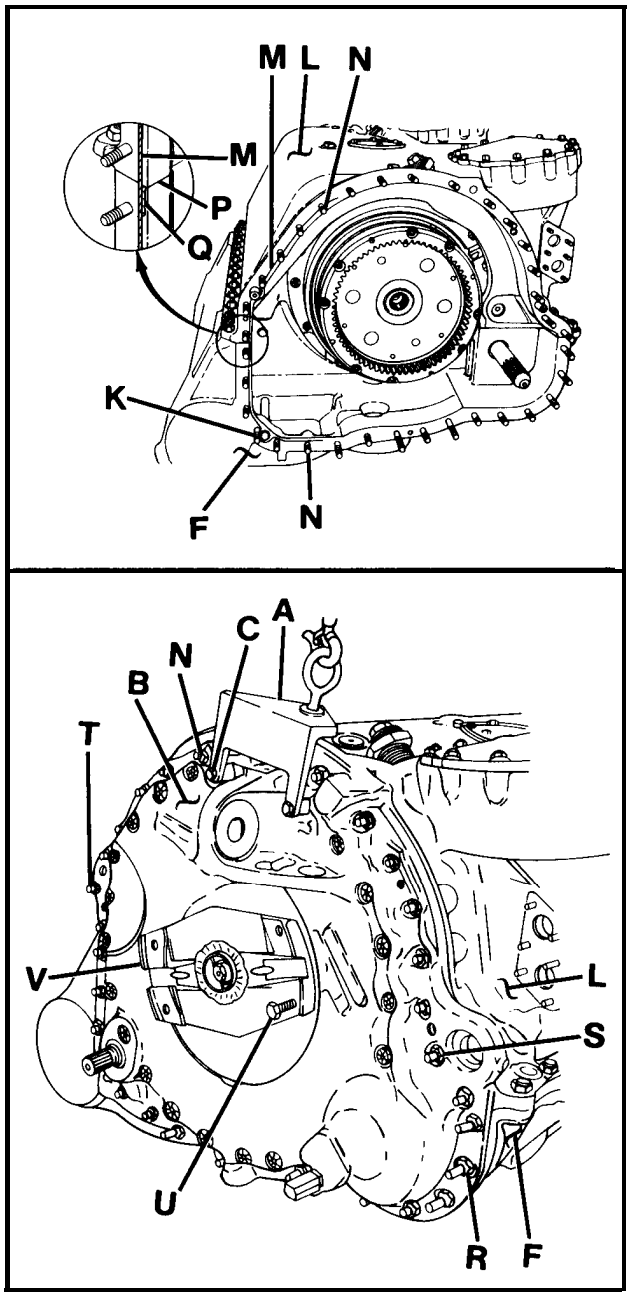
9. Using box wrench, remove two bolts (C) attaching lifting bracket (A). Remove lifting bracket (A).

10. Using 9/16-inch socket, extension, and torque wrench, install two bolts in holes where bolts (C) were removed. Tighten to 41 to 49 lb-ft (56 to 66 N·m).

11. Using 3/4-inch socket, extension, and torque wrench, install remaining two nuts (R) in locations that were not accessible in Step 8. Tighten two nuts (R) to 67 to 80 lb-ft (91 to 109 N·m).

12. Remove bolt (U) that was installed in one of the holes in thrust washer bearing (output flame) (V) during disassembly.

END OF TASK



TA 272374

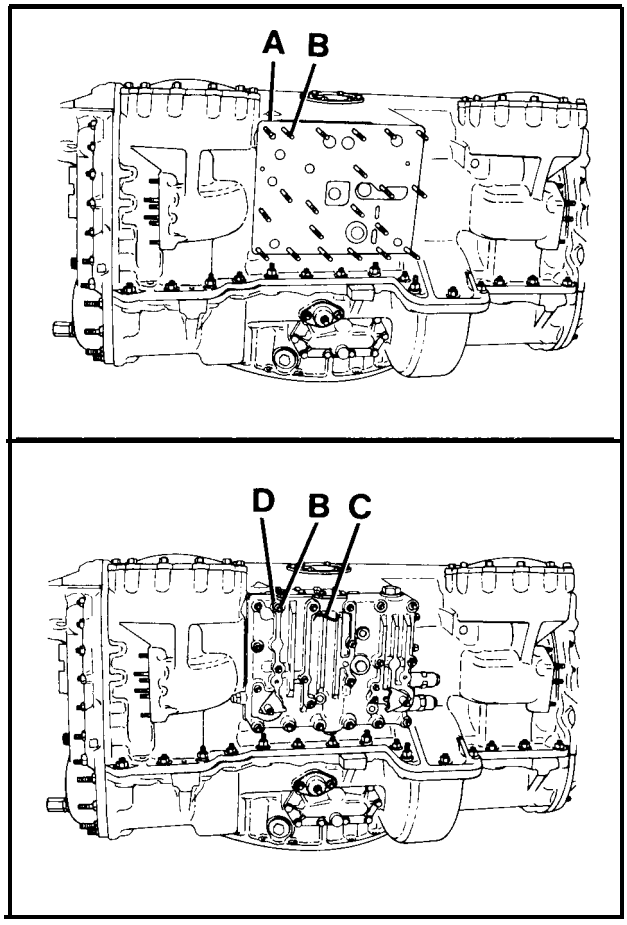
INSTALL CONTROL VALVE BODY ASSEMBLY

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive torque wrench

PRELIMINARY PROCEDURE: Install Right End Cover Assembly (Page 2-76)

1. Oil gasket (A) with transmission oil (item 4, Appendix C) and install over studs (B).
2. Install control valve body (C) onto studs (B).
3. Install 22 nuts (D) onto studs (B).
4. Using socket, extension, and torque wrench, tighten 22 nuts (D) to 26 to 32 lb-ft (35 to 43 N·m).

END OF TASK



TA 272375

INSTALL STRAIGHT SHAFT (INPUT SHAFT) AND OIL INPUT PUMP DRIVE GEAR (Sheet 1 of 2)

TOOLS: 1-1/16 in. 1/2-in. drive socket
1/2-in. drive breaker bar
Internal retaining ring pliers
Hoist, 2-ton minimum capacity (two required)
3/4-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive torque wrench
Pry bar

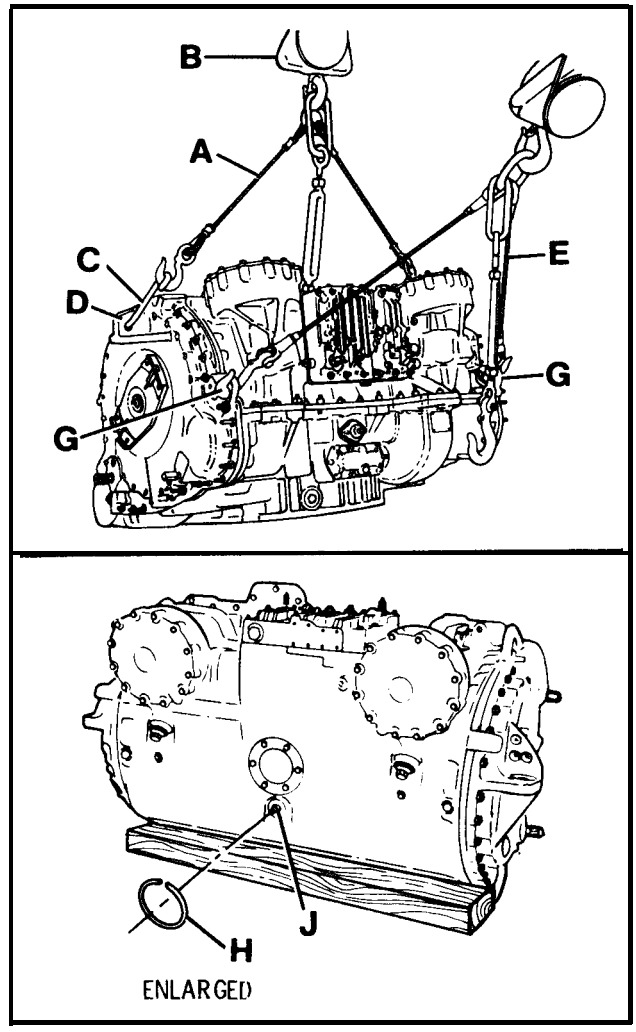
SPECIAL TOOLS: Lifting sling, P/N 7081593 (two required)
S hook, P/N 11650102 (two required)

SUPPLIES: Wood blocks of various sizes

PRELIMINARY PROCEDURE: Install Control Valve Body Assembly (Page 2-78)

1. Attach lifting sling (A) to hoist (B) and S hooks (c). Insert S hooks (C) into transmission mounting flange holes (D).
2. Raise transmission with hoist (B).
3. Attach lifting sling (E) to hoist (F) and end cover lifting eyes (G).
4. Rotate transmission by raising hoist (F) until end cover lifting eyes (G) are in upward position.
5. Lower hoist (B) and take away sling (A) and S hooks (C).
6. Lower hoist (F) until transmission is resting on bottom of housings Use wood blocks to stabilize, as necessary. Lower hoist (F) and take away sling (E).
7. Using internal retaining ring pliers, install retaining ring (H) in drive transfer gear (J) with numbers toward rear of transmission.

Go on to Sheet 2.



TA 272376

INSTALL STRAIGHT SHAFT (INPUT SHAFT) AND OIL INPUT PUMP DRIVE GEAR (Sheet 2 of 2)

8. Install gasket (K) and input shaft plug (L). Using 1-1/16 inch socket and breaker bar, tighten input shaft plug (L).

NOTE

It is not necessary to torque input shaft plug (L) at this time.

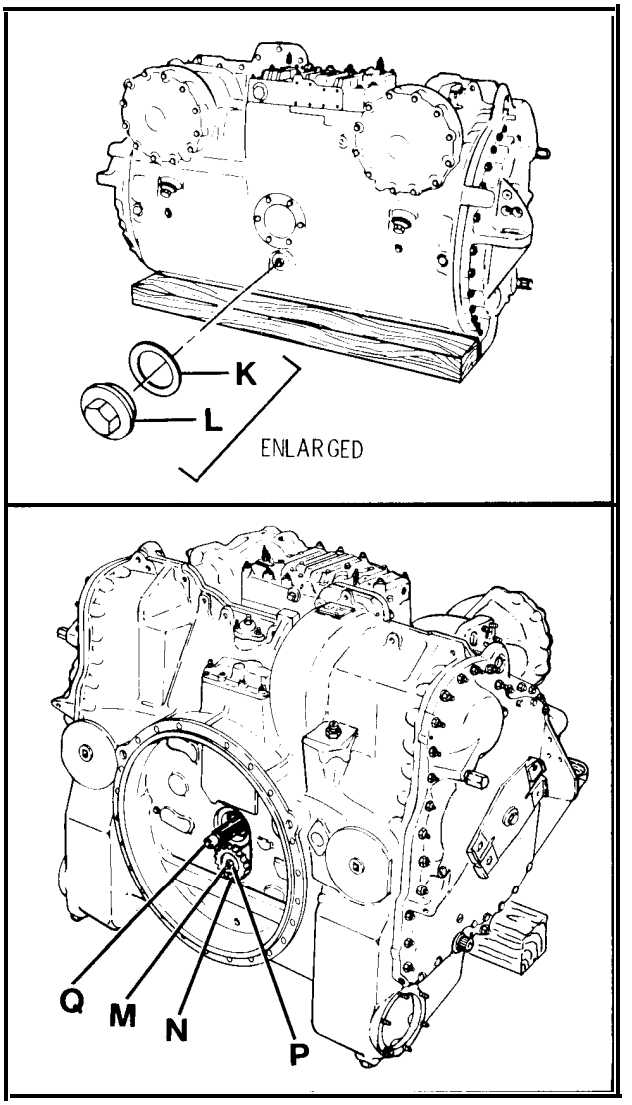
9. Install Woodruff key into oil input pump shaft (M).

10. Install oil input pump drive gear (N) and self-locking nut (P).

11. Insert input shaft (Q), pilot diameter forward, from front of transmission and aline splines on shaft (Q) with splines in input drive gear (N).

12. Use pry bar to keep gear (N) from turning. Using 3/4-inch socket, extension, and torque wrench, tighten nut (P). First notice how much torque it takes to turn nut (P) on the shaft; then tighten nut (P) to 30 lb-ft (41 N•m) greater than the torque noted.

END OF TASK



TA 272377

ADJUST BAND ADJUSTING SCREWS

TOOLS: 1-1/16 in. 1/2-in. drive socket
1-1/16 in. open end wrench
9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
3/4-in. to 1/2-in. adapter

SPECIAL TOOLS: Socket wrench socket, PIN 7003946

PRELIMINARY PROCEDURE: Install Straight Shaft (Input Shaft) and Oil Input Pump Drive Gear (Page 2-79)

NOTE

Hardware and procedures for adjustment of the low and reverse-range bands are identical.

1. Using 1-1/16 inch socket and torque wrench, tighten adjusting screws (A) and (B) to 30 lb-ft (41 N·m); then back off one full turn (two places).

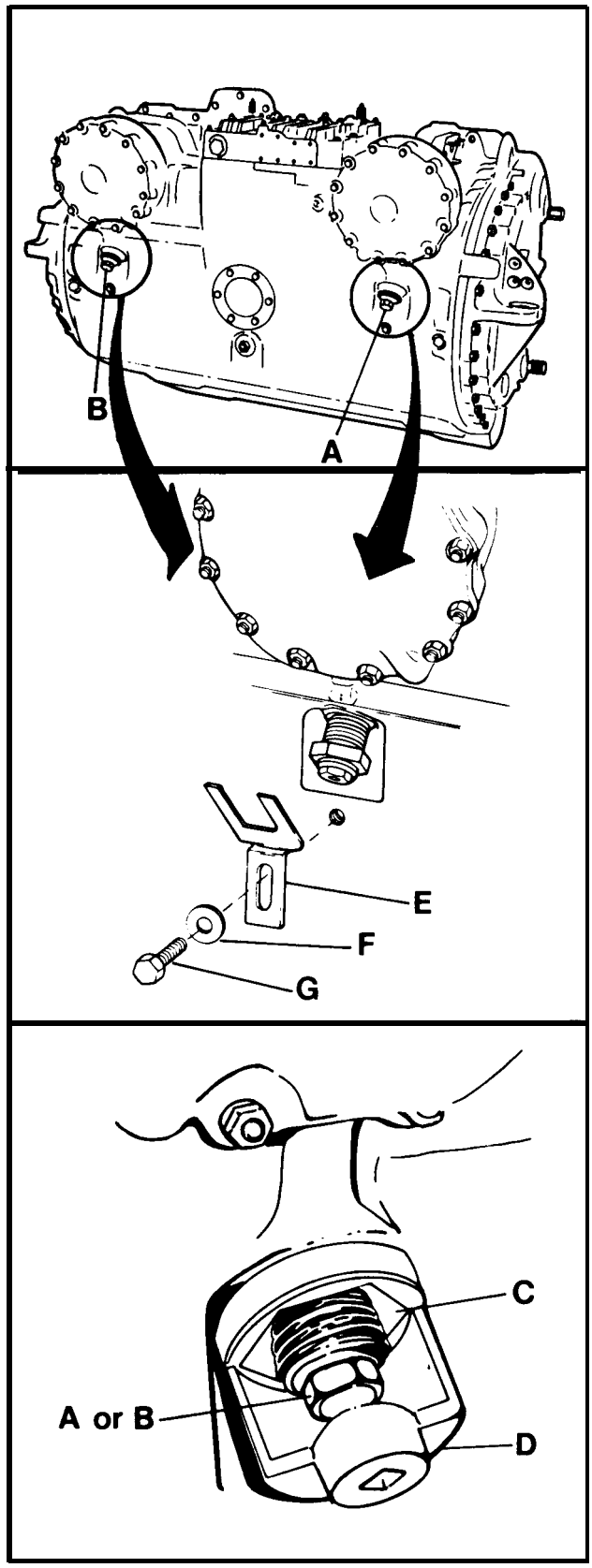
2. Install gasket and self-locking nut (C) on adjusting screw (A) or (B) (two places).

3. Using socket wrench socket (D), adapter, and torque wrench, and 1-1/16 inch open end wrench, tighten locknut (C) to 150 lb-ft (203 N·m) (two places). Line up flats on locknut (C) so that locking plate (E) may be installed.

4. Install locking plate (E), washer (F), and bolt (G) (two places).

5. Using 9/16-inch socket and torque wrench, tighten bolt (G) to 18 to 22 lb-ft (25 to 29 N·m) (two places).

END OF TASK



TA 272393

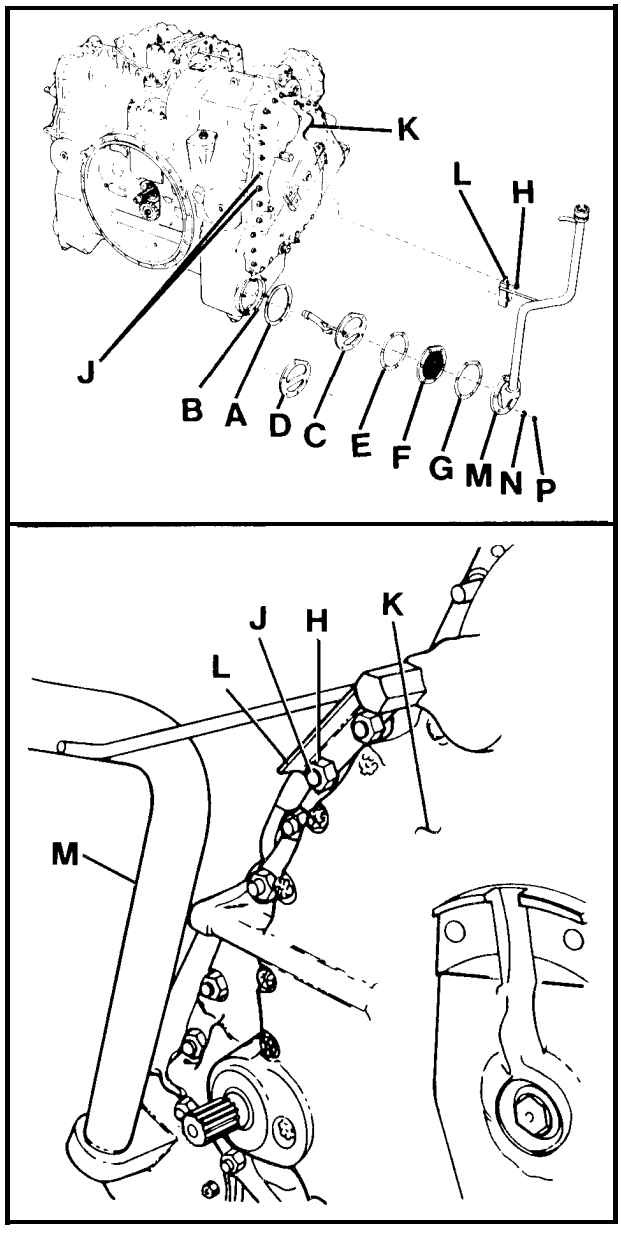
INSTALL SIDE OIL FILLER (Sheet 1 of 2)

TOOLS: 3/4-in. open end wrench
7/8-in. open end wrench
3/4-in. 1/2-in. drive socket
1/2-in. drive torque wrench
1/2-in. 1/2-in. drive socket
Hose clamp pliers

PRELIMINARY PROCEDURE: Adjust Band Adjusting Screws (Page 2-81)

1. Oil gasket (A) with transmission oil (item 4, Appendix C). Aline and install on studs (B).
2. (CD 850-6A Only) Install strainer assembly (C).
3. (CD 850-6A-1 Only) Install side oil screen cover plate (D).
4. Oil gasket (E) with transmission oil (item 4, Appendix C). Aline and install on studs (B).
5. Install sediment strainer element (F) on studs (B).
6. Oil and install gasket (G) on studs (B).
7. Using 3/4-inch socket, remove two nuts (H) off long studs (J) on left end cover assembly (K). These are the studs to which bracket (L) will be attached.
8. Install bracket (L) on studs (J) alining holes in tube assembly (M) with studs (B).
9. Using 3/4-inch socket, reinstall two nuts (H) removed in step 7. Tighten nuts (H) to 67 to 80 lb-ft (91 to 109 N·m).
10. Using 1/2-inch socket and torque wrench, install six lockwashers (N) and nuts (P) and tighten to 20 to 23 lb-ft (27 to 31 N·m).

Go on to Sheet 2.



TA 272378

INSTALL SIDE OIL FILLER (Sheet 2 of 2)

11. Install one end of rubber tube (Q) over end of small tube assembly (R) and, using hose clamp pliers, fasten both tubes together by securing hose clamp (S).

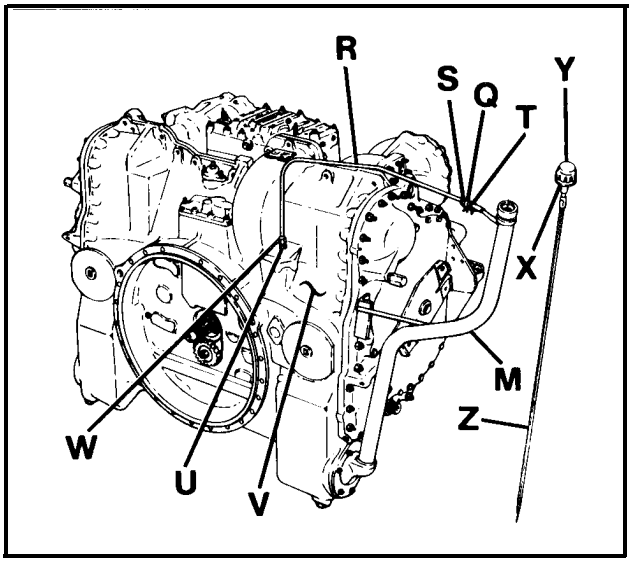
12. Slide hose clamp (T) and open end of rubber tube (Q) over end of large tube assembly (M). Using hose clamp pliers, secure hose clamp (T).

13. Using 3/4-inch open end wrench, hold adapter (U) in housing (V) to prevent adapter (U) from turning. Using 7/8-inch open end wrench, tighten nut (W) that secures small tube assembly (R) to adapter (U).

14. Check to ensure gasket (X) is present inside cap (Y). If missing, install new gasket (X).

15. Install dipstick (Z) into large tube assembly (M) with a clockwise twisting motion until cap (Y) is seated on tube assembly (M).

END OF TASK



TA 272379

CHAPTER 3
MAJOR COMPONENT MAINTENANCE INSTRUCTIONS

Section I. INTRODUCTION

3-1 OVERVIEW

a. This chapter provides separate maintenance instructions for the repair of each of the major components in a CD-850-6A transmission. A separate section has been devoted to each major component as follows:

(1) Section II - End Cover Assemblies

(2) Section III - Front Cover Assembly

(3) Section IV - Rear Cover Assembly

(4) Section V - Inner Unit Assembly

(5) Section VI - Control Valve Assembly

b. Maintenance instructions for the Planetary Assemblies and the Oil Pump Assemblies have not been provided. Repair of these items is beyond the capabilities of Direct and General Support maintenance and should not be attempted below depot level.

3-2 CLEANING

a. Subassembly cleaning procedures, as provided on page 2-17 should be completed prior to disassembly of major components.

b. Additional cleaning of individual component parts may be necessary after disassembly.

3-3 LUBRICATION RECOMMENDATIONS

Lubrication recommendations, as provided on page 2-22, must be observed during all maintenance operations.

3-4 INSPECTION AND REPAIR RECOMMENDATIONS

Inspection and repair recommendations procedures, as provided on page 2-19, must be followed.

3-5 ESSENTIAL REPAIR CONCEPT

Direct and General Support maintenance activities function on a concept of performing only those repairs that are essential to return the transmission to a serviceable condition. Major components should be disassembled only to the extent necessary to perform essential repairs. Complete disassembly should be accomplished only during overhaul at depot level.

3-6 MANDATORY REPLACEMENT PARTS

Certain items, such as gaskets, preformed packings, oil seals, cotter pins, and lockwire may be deformed during use and are very often damaged or destroyed during removal. Such items should be discarded as they are removed during disassembly. New, replacement items must be used for reassembly.

Section II. END COVER ASSEMBLIES

3-7 OVERVIEW

a. Left and right end cover assemblies are functionally identical and they each contain the same complement of component parts. Some of the individual components are mirror-images of each other for left- and right-handed applications.

b. The procedures in this section apply specifically to the left end cover assembly, as written. When working on a right end cover assembly, it is only necessary to substitute "right" for "left" in the text, and to perceive the illustrations as mirror-images.

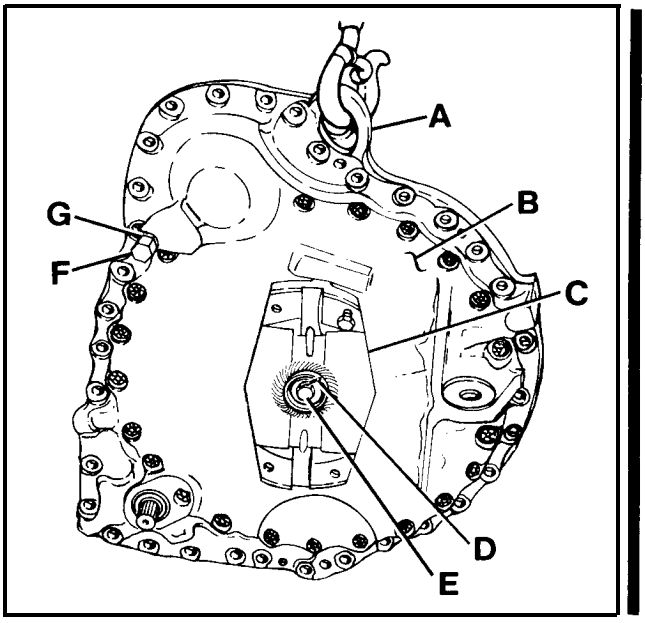
c. Procedures have been provided for complete disassembly of the end cover assembly. Disassemble only to the extent necessary to accomplish the required repair.

REMOVE THRUST WASHER BEARING (OUTPUT FLANGE), SLEEVE NUT (BRAKE ADJUSTMENT WORM CAP), AND LOCKNUT

TOOLS: 15-16 in. box wrench
1-in. box wrench
7/8-in. 1/2-in. drive socket
1/2-in. drive breaker bar
Diagonal pliers
Hoist, 2-ton minimum capacity

SUPPLIES: Wood blocks of various sizes

PRELIMINARY PROCEDURE: Remove Left End Cover Assembly (Page 2-31) or Remove Right End Cover Assembly (Page 2-3 3)



1. Using hoist through lifting eye (A) position end cover assembly (B) over work surface so that it is leaning to output flange (C) side.

2. Using diagonal pliers, remove lockwire (D) from output flange retaining screw (E).

3. Using 7/8-inch socket and breaker bar, remove screw (E) and washer. Remove flange (C).

NOTE

The oil seal behind flange (C) can be removed if necessary by using a mechanical puller.

4. Using 1-inch box wrench, remove worm cap (F) and using 15/16-inch wrench, remove locknut (G).

5. Lower end cover assembly (B) to work surface resting on output flange (C) side. Use wood blocks to stabilize, as necessary.

END OF TASK

TA 272380

REMOVE BRAKE ADJUSTMENT COMPONENTS

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
Internal retaining ring pliers
Plastic insert hammer

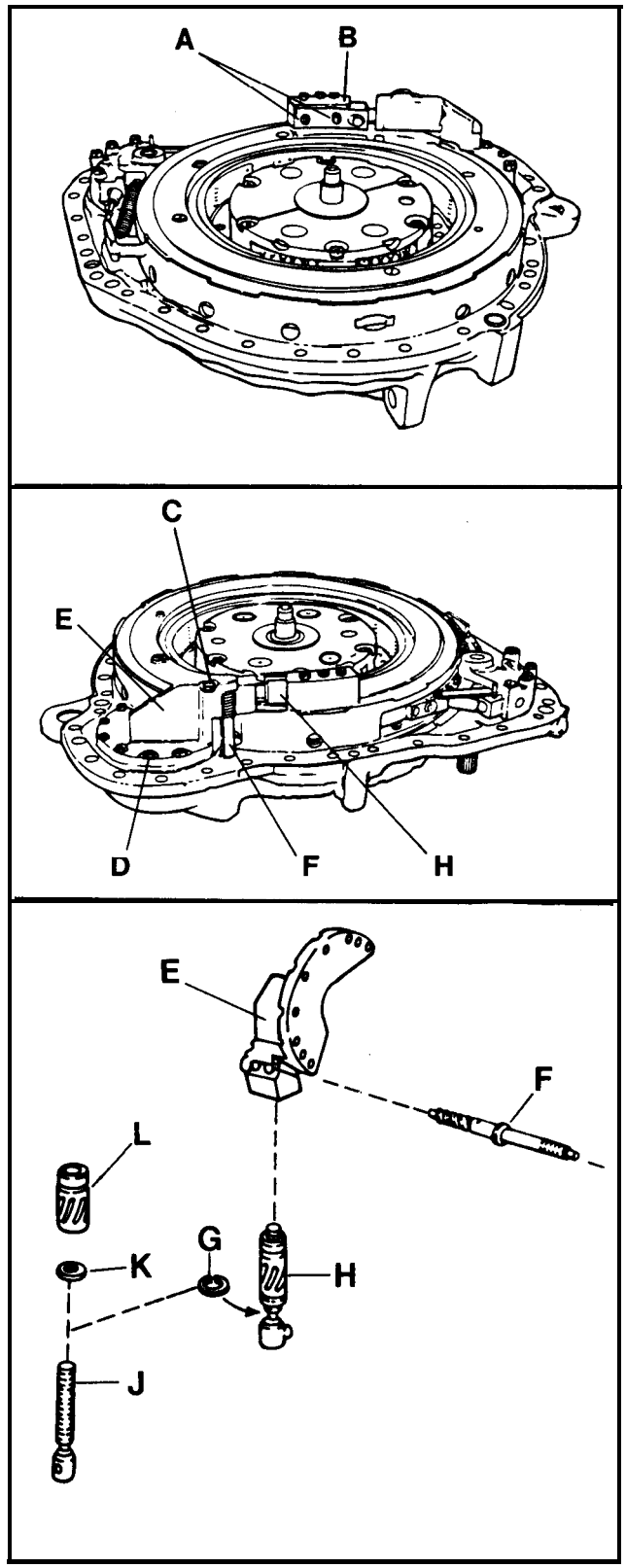
PRELIMINARY PROCEDURE: Remove Thrust Washer Bearing (Output Flange), Sleeve Nut (Brake Adjustment Worm Cap), and Locknut (page 3-4).

1. Using socket and breaker bar, remove two bolts (A). Remove locator plate (B).
2. Using socket and breaker bar, remove one cap screw (C) and six bolts (D).
3. Remove brake adjustment bracket assembly (E). It may be necessary to tap with plastic insert hammer.
4. Remove worm shaft (F) and washer from bracket assembly (E).
5. Using internal retaining ring pliers, remove retaining ring (G) from bolt assembly (H).
6. Remove adjusting bolt (J), washer (K) and gear (L) from bracket assembly.

NOTE

If the bolt assembly shows signs of damage, replace it.

END OF TASK



TA236526

REMOVE BRAKE RETURN CAM COMPONENTS

TOOLS: 9/16-in. box wrench
Flat-tip screwdriver

PRELIMINARY PROCEDURE: Remove Brake Adjustment Components (Page 3-5)

1. Using screwdriver (A) between brake apply shaft bracket (B) and seat assembly (C), compress cam return spring (D) sufficiently to remove it. Remove seat assembly (C) and pin (E).

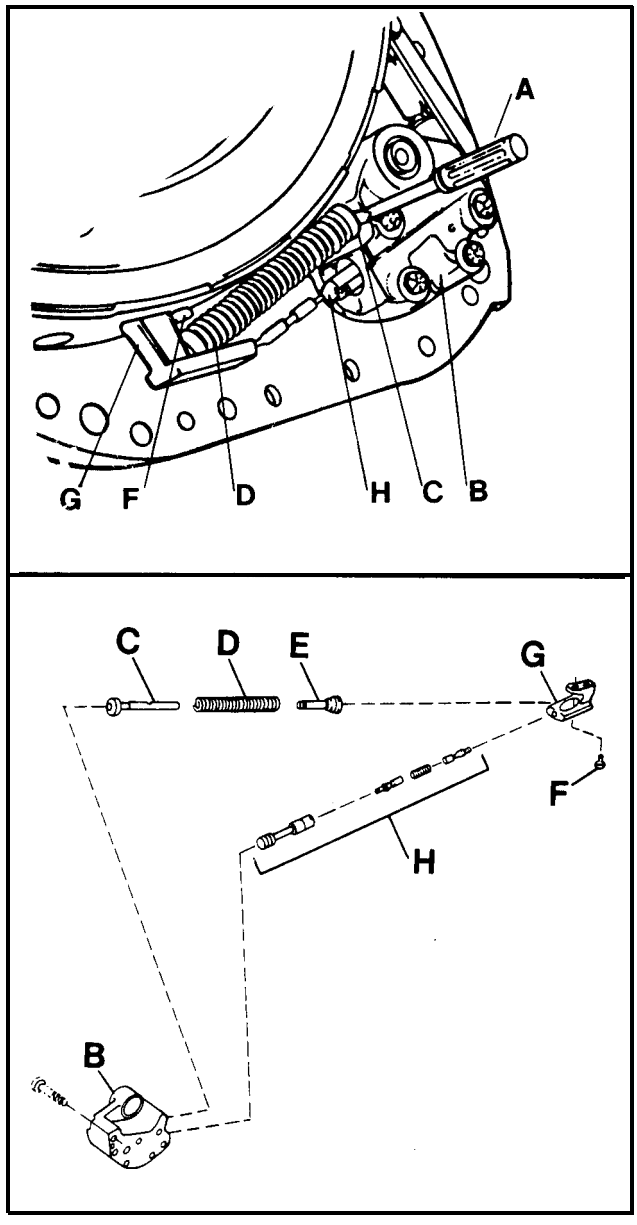
2. Using box wrench, remove bolt (F).

3. Remove cam return bracket (G) with linkage and brake cooling oil valve (H) attached.

NOTE

Do not disassemble cooling oil valve linkage (H) unless replacement is necessary. The stroke of the cooling oil valve is adjusted to the particular end cover when linkage is assembled during manufacture. If any part is replaced, readjustment, using new ball joints and stud, is required.

END OF TASK



TA236527

REMOVE BRAKE APPLY COMPONENTS

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
Diagonal pliers
Flat-tip screwdriver

PRELIMINARY PROCEDURE: Remove Brake Return Cam Components (Page 3-6)

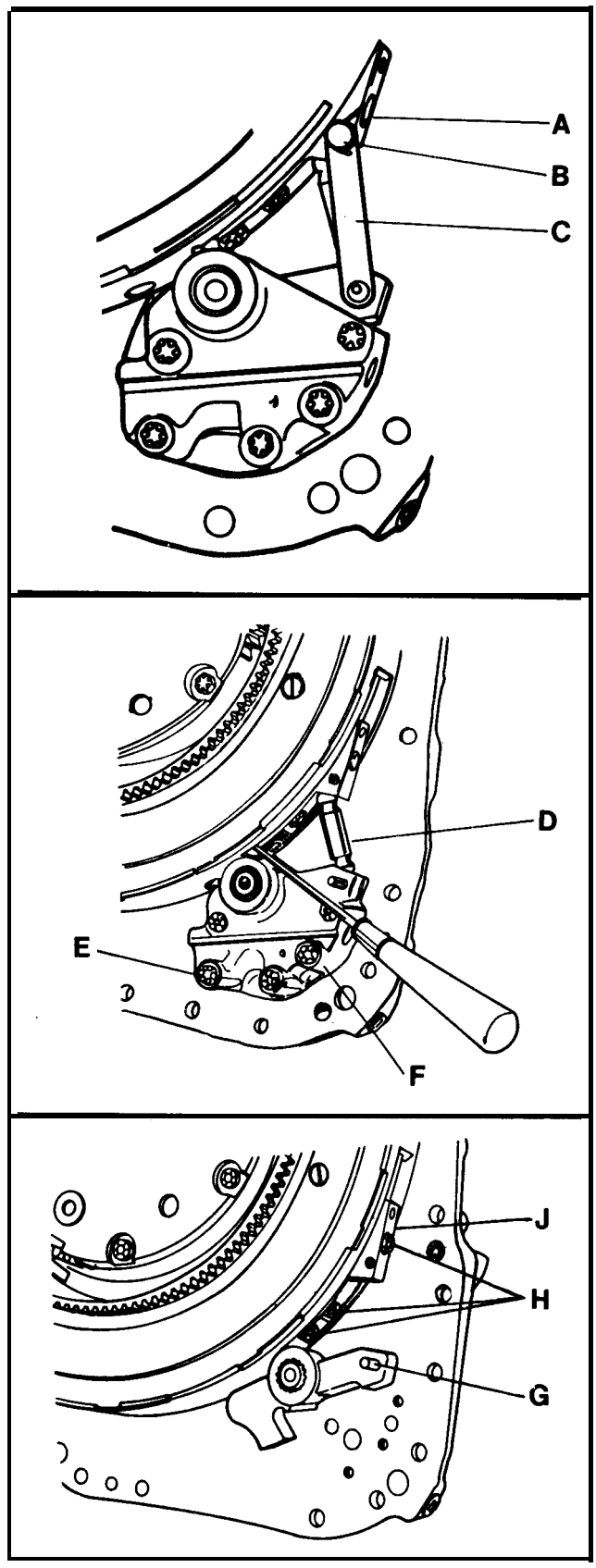
1. Using diagonal pliers, remove lock wire (A).
2. Using socket and breaker bar, remove bolt (B) and washer. Remove brake apply strut retainer (C).
3. Using screwdriver, rotate stationary cam sufficiently toremove brake apply strut (D).
4. Using socket and breaker bar, remove five bolts (E). Remove brake apply shaft bracket (F).

NOTE

Remove needle bearing from bracket only if replacement is required.

5. Remove brake apply lever (G).
6. Using socket and breaker bar, remove three bolts (H). Remove brake apply cam bracket (J).

END OF TASK



TA236528

REMOVE STATIONARY CAM RING

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
Centering punch
Machinist's hammer
Plastic insert hammer

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Remove Brake Apply Components (Page 3-7)

1. Using centering punch and machinist's hammer, make mating marks on stationary cam ring (A) and brake anchor (B).

NOTE

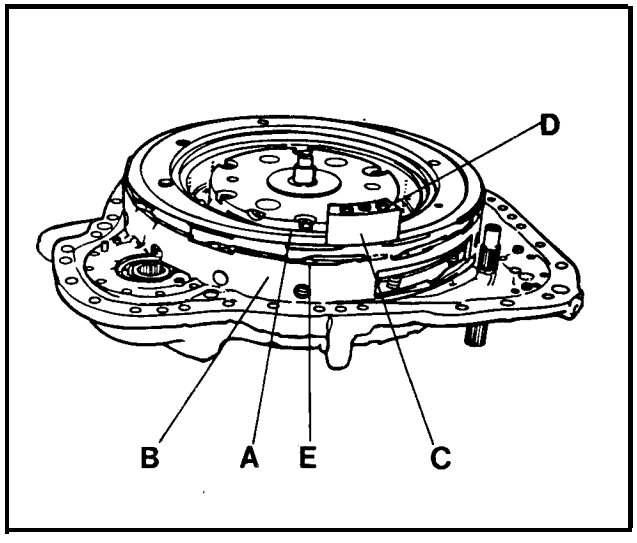
The brake assembly is under spring load. It is advisable for one person to hold down on stationary cam ring (A) while a second person performs Step 2.

2. Using plastic insert hammer, tap on block (C) to rotate cam ring (A) until tabs on ring aline with slots in anchor (B).

3. Using socket and breaker bar, remove three bolts (D). Remove block (C).

4. Remove stationary cam ring (A). Remove 12 bearing balls (E).

END OF TASK



TA236529

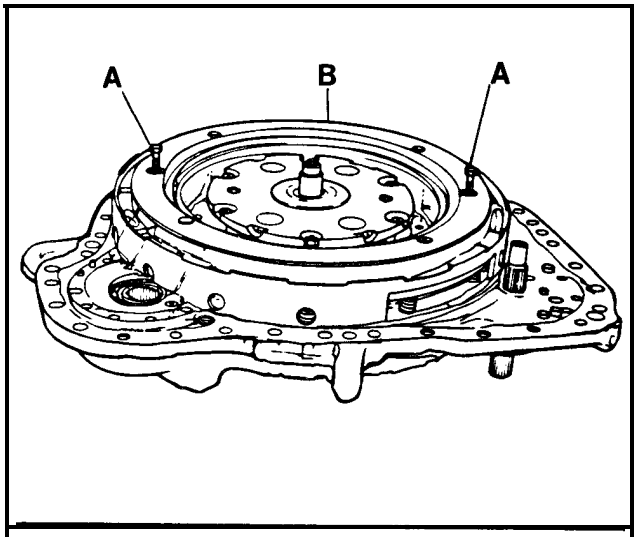
REMOVE ROTATING CAM RING AND PISTON

TOOLS: Flat-tip screwdriver
9/16-in. combination wrench

SUPPLIES: Two 3/8-16 x 2-in. bolts

PRELIMINARY PROCEDURE Remove Stationary Cam Ring (Page 3-8)

1. Using wrench, install two 3/8 - 16 x 2-inch bolts (A) and lift entire rotating cam ring and piston assembly (B) out of brake hub. Remove the bolts (A).



CAUTION

If assembly not turned over as directed in the next step, 247 bearing balls will be spilled.

2. Turn the assembly over. Using screwdriver, remove the two setscrews (C) that hold rotating cam ring (D) to piston (E).

3. Gently lift piston (E) off rotating cam (D). Remove 247 bearing balls and place in a suitable receptacle.

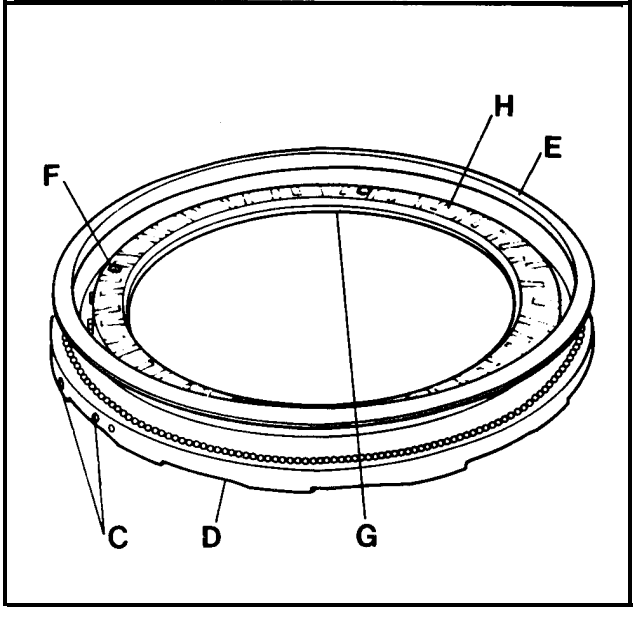
NOTE

The threaded ends of the four screws (F) that hold the baffle to the piston are peened at assembly. It may be necessary to drill the ends to facilitate removal.

4. Using screwdriver, remove four screws (F).

5. Remove baffle (G) and pressure plate (H).

END OF TASK



TA236530

REMOVE BRAKE HUB AND OUTPUT CARRIER ASSEMBLY

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
5/8-in. 1/2-in. drive socket
Flat-tip screwdriver
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling, P/N 7073778

SUPPLIES: 7/16-20 x 2-in. bolts (two required)
Wood blocks

PERSON N EL: Two persons required

PRELIMINARY PROCEDURE: Remove Rotating Cam Ring and Piston (Page 3-9)

1. Using 5/8-inch socket and breaker bar, remove two directly opposite bolts from assembly. Use two 7/16-20 x 2-inch bolts to attach lifting sling to brake hub (A). Attach hoist to sling and lift assembly out of end cover.

2. Place on work surface and remove lifting sling and two bolts.

3. Turn assembly over and place on surface with splined shaft (B) facing upward. Use wood blocks for stability.

4. Using 9/16-inch socket and breaker bar, remove eight bolts (C) and four flexible hub springs (D) and support blocks (E).

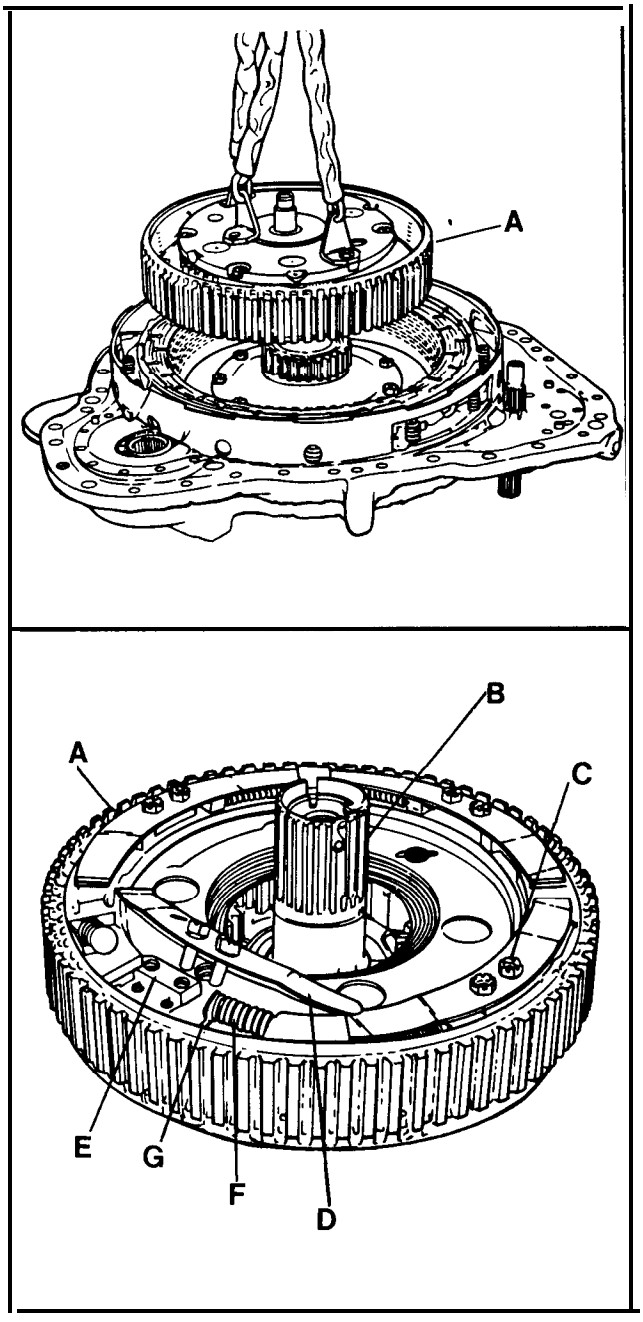
5. Using screwdriver, remove eight damper springs (F) and sixteen damper buttons (G).

6. Remove brake hub (A).

NOTE

Do not disassemble output planetary carrier assembly. This is a depot function.

END OF TASK



TA236531

REMOVE BRAKE PLATES AND ANCHOR

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
External retaining ring pliers
Hoist, 2-ton minimum capacity
Pry bar
Plastic insert hammer

PRELIMINARY PROCEDURE: Remove Brake Hub and Carrier Assembly (Page 3-10)

NOTE

Keep brake plates in sequence unless they are to be replaced.

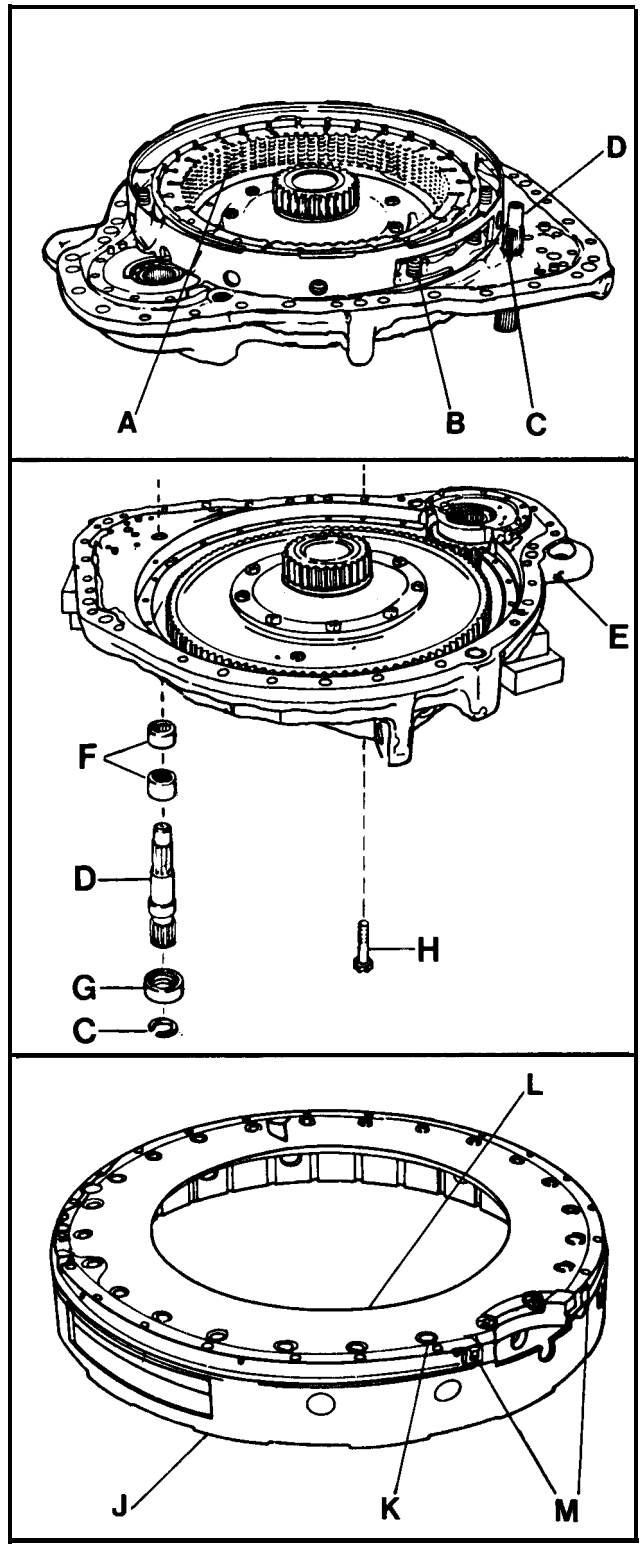
1. Remove 13 brake plates (A) and 12 release springs (B).
2. Using external retaining ring pliers, remove retaining ring (C) from brake apply shaft (D).
3. Attach hoist to lifting eye (E) and raise cover.
4. Remove brake apply shaft (D).

NOTE

Remove the brake apply shaft needle bearings (F) and seal (G) only if replacement is required.

5. Using socket and breaker bar, remove 19 bolts (H).
6. Lower cover back to surface. Remove lifting sling from end cover.
7. Use pry bar to raise brake anchor (J) and remove anchor. Remove oil seal.
8. Invert brake anchor. Using socket and breaker bar, remove 24 bolts (K). Using plastic insert hammer, remove pressure plate (L). Replace two rubber plugs (M) if worn.

END OF TASK



TA236532

REMOVE SPUR GEARS (OUTPUT SUN GEAR, STEER OUTPUT GEAR) (Sheet 1 of 2)

TOOLS: 3/4-in. 1/2-in. drive socket
1/2-in. drive breaker bar
Hoist, 2-ton minimum capacity
Pry bar (two required)
Machinist's hammer
Straight

SPECIAL TOOLS: Lifting sling, P/N 7073778

PERSON N EL: Two persons required

PRELIMINARY PROCEDURE: Remove Brake Plates and Anchor (Page 3-11)

1. Using socket and breaker bar, loosen 12 bolts (A) while using pry bar (B) to prevent gear rotation. Remove three equally spaced bolts (A).

2. Using removed bolts (A), attach lifting sling (C) to sun gear hub (D).

3. Using hoist, lift sun gear hub (D) and steer output gear (E) as an assembly out of cover. Set on clean work surface.

NOTE

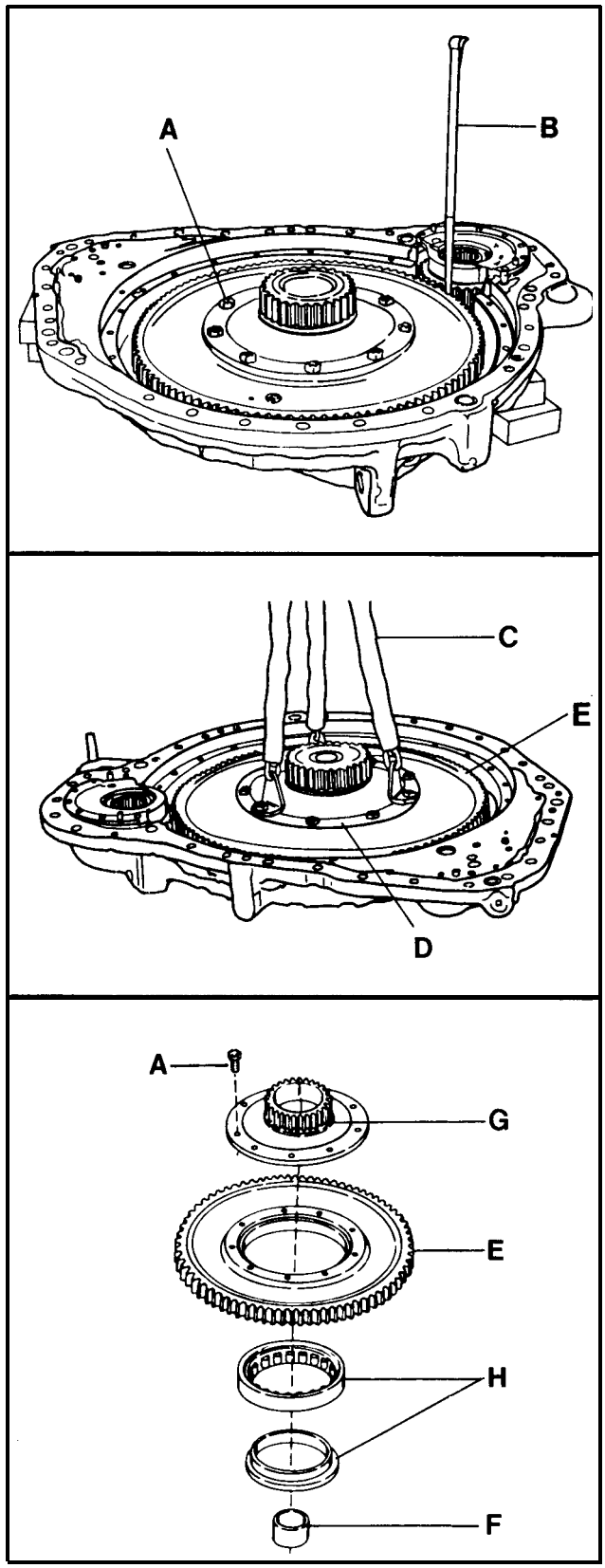
Do not remove sleeve bearing (F) from sun gear hub (G). Replacement of this bearing is a depot level task.

4. Using socket and breaker bar, remove all nine bolts (A), thereby also removing sling.

NOTE

Cylindrical roller bearing (H) is a matched assembly, and if suitable for reuse, must be rematched with serial numbers on the inner and outer races.

Go on to Sheet 2.



TA236533

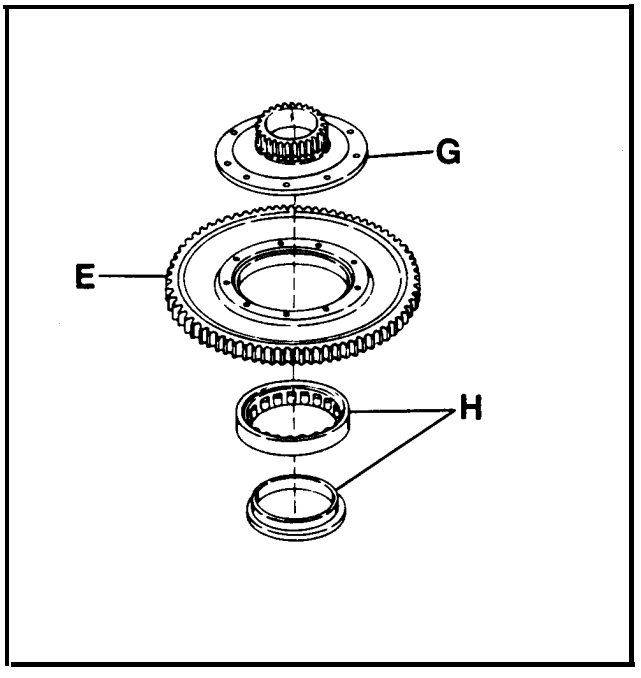
REMOVE SPUR GEARS (OUTPUT SUN GEAR, STEER OUTPUT GEAR) (Sheet 2 of 2)

5. Remove output sun gear (G) from steer output gear (E).

6. Using hammer and straight, remove bearing (H) outer race and rollers from steer output gear (E).

7. Using two pry bars, remove bearing (H) inner race from end cover.

END OF TASK



TA236534

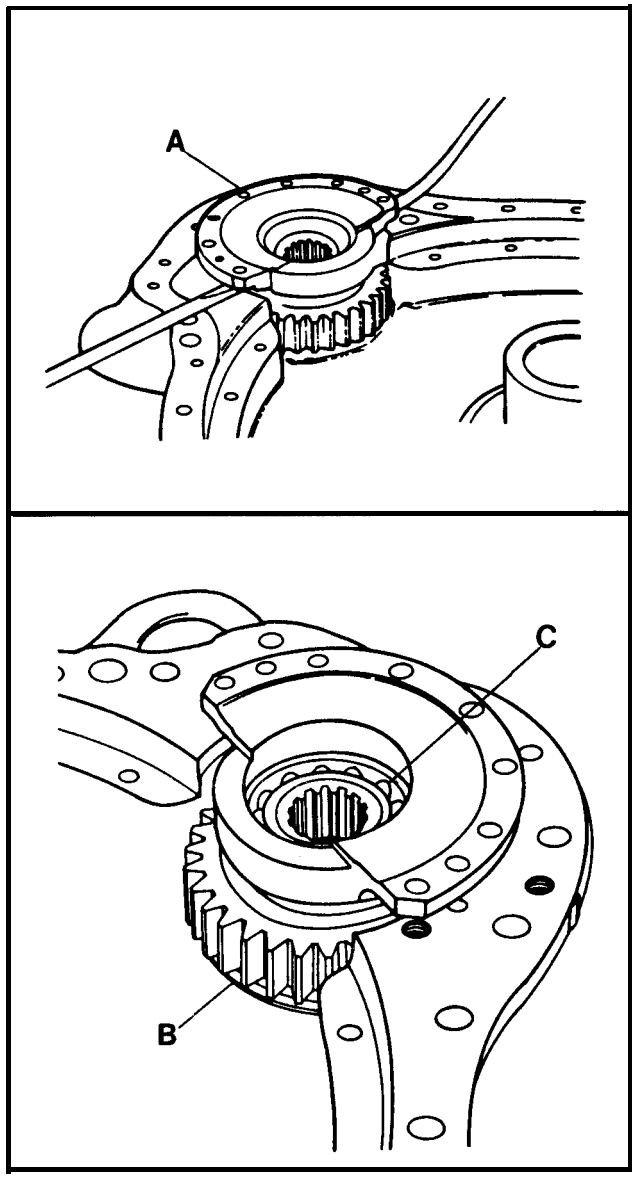
REMOVE STEER PINION

TOOLS: Pry bar (two required)

PRELIMINARY PROCEDURE: Remove Sun and Steer Output Gears (Page 3-12)

1. Using two pry bars, pry bearing support (A) out of cover.
2. Remove pinion gear and bearing assembly (B).
3. If damaged, remove bearings (C) from pinion with the aid of a gear puller.

END OF TASK



TA236535

3-8 CLEANING

Clean all end cover assembly parts, as necessary, in accordance with page 2-17.

3-9 INSPECTION AND REPAIR (Sheet 1 of 3)

a. Refer to Page 2-19 for general inspection and repair recommendations.

b. Additional repair procedures which may occasionally be necessary are provided below.

1. Using screwdriver, remove seal (A). Seal should be installed after shouldered shaft (brake apply shaft) (B) is installed.

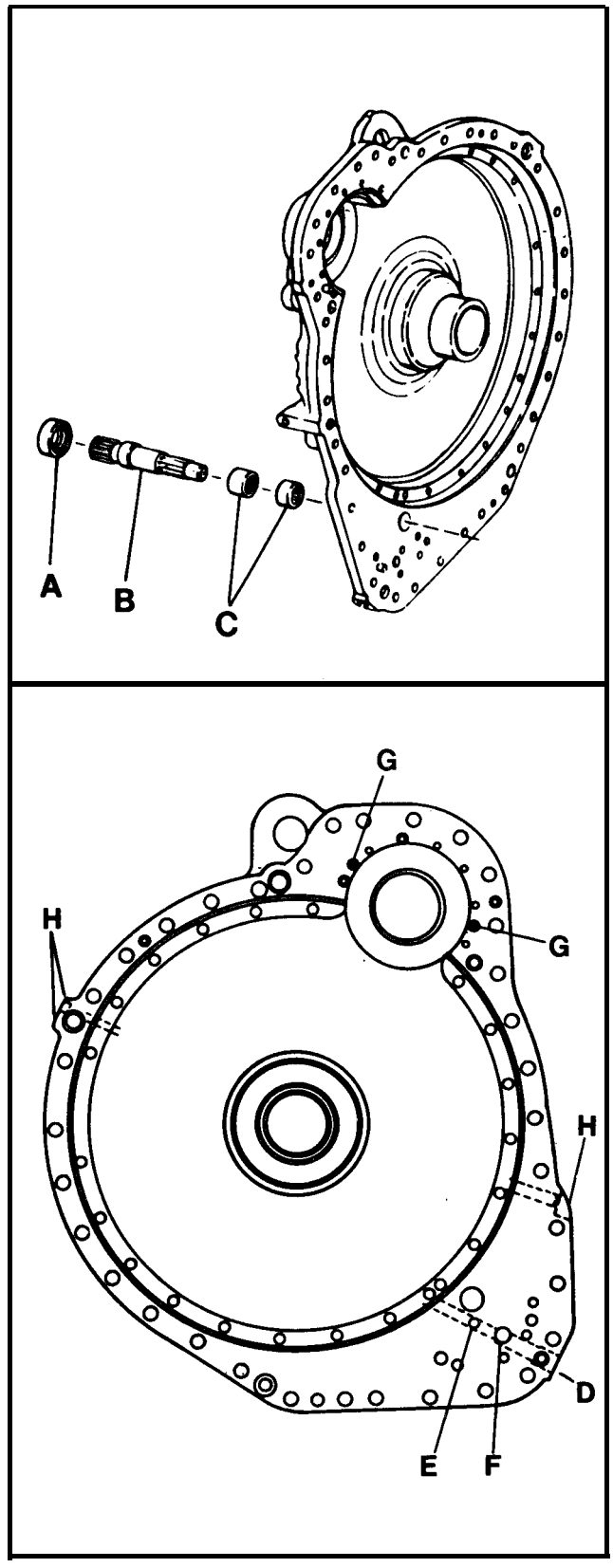
2. Use a bearing puller to remove needle bearings (C). Use a hammer, needle bearing replacer P/N 7082981, and handle P/N 7082196 to install inner bearing.

3. If damaged, remove outer plug (D) with 3/8-inch drive breaker bar. Check to see if inner plug is present. If missing, install new plug. The installed plug must block the web between holes (E) and (F).

4. If dowel pins (G) are damaged, replace as needed (page 3-16).

5. If plugs (H) are missing, use hammer and straight to pound new plugs in below surface. Stake in three places.

Go on to Sheet 2.



TA236536

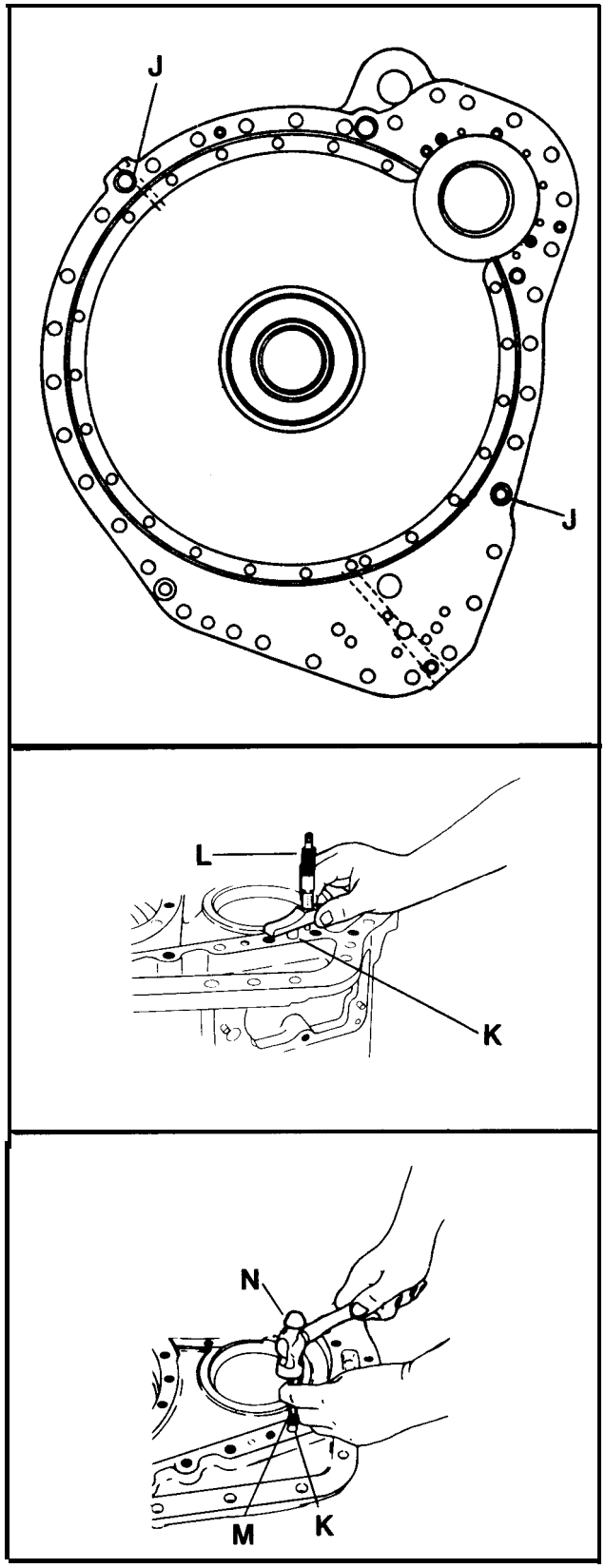
3-9 INSPECTION AND REPAIR (Sheet 2 of 3)

6. To remove sleeve spacers (J), use puller bolt, mechanical puller, and tap and die set. If plug is missing, use hammer and straight to pound new plug in below surface and stake in three places. Using hammer and straight, install spacers (J) flush to 0.010-inch (0.025 mm) below surface of end cover.

c. Procedures for replacement of damaged dowel pins are provided below.

1. Measure height of damaged dowel pin (K) with depth gage (L). Record the measurement.

2. Using a center punch (M) and ball peen hammer (N), center punch the end of dowel pin (K).



TA236537

Go on to Sheet 3.

3-9 INSPECTION AND REPAIR (Sheet 3 of 3)

3. Cover the area around dowel pin (K) with clean cloths (P) and masking tape (Q). This will keep chips out of openings.

4. Drill pin (K) with electric drill (R) and No. 21 twist drill (S).

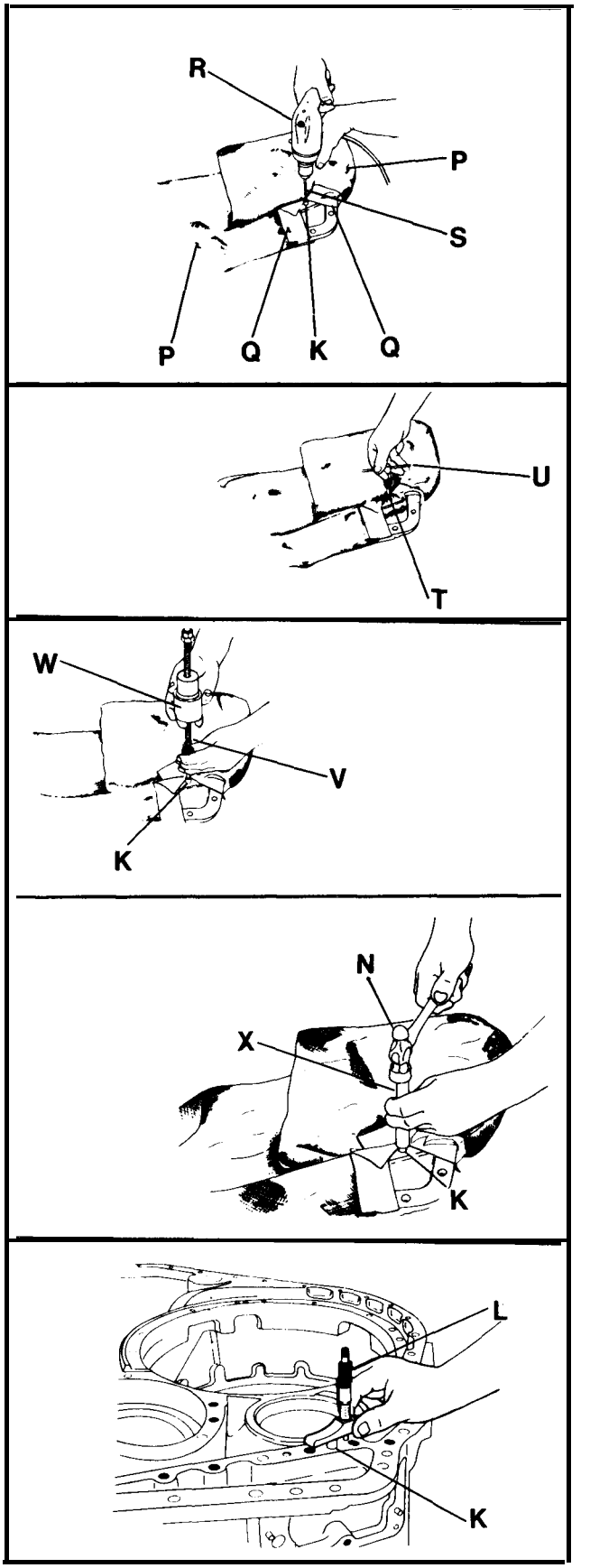
5. Tap hole with No. 10 tap (T) and tap handle (U).

6. Screw MS 9783-18 bolt (V) into tapped hole in pin (K). Attach slide hammer (W) and pull pin from housing.

7. Put new pin (K) into hole in housing. Using a pin punch (X) and ball peen hammer (N), set pin (K) to the height recorded in step 1.

8. Use depth gage (L) to check height of pin (K).

END OF TASK



TA236538

INSTALL OUTPUT FLANGE OIL SEAL

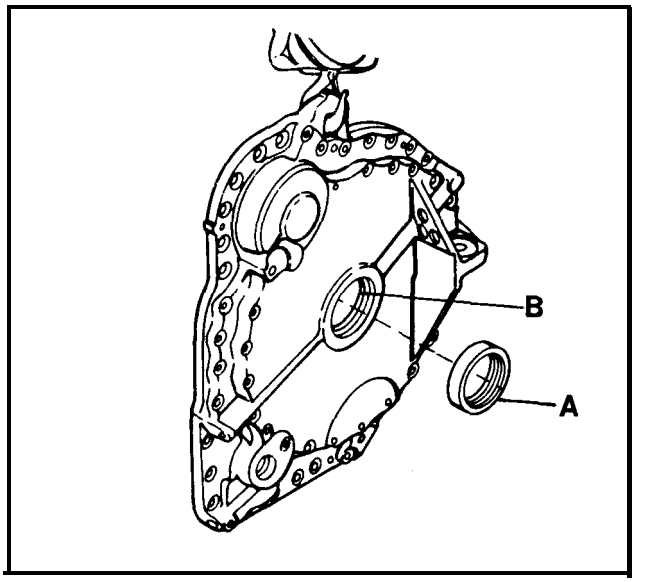
TOOLS: Arbor press

PRELIMINARY PROCEDURE: Cleaning and Inspection (Page 3-15)

1. Lubricate oil seal (A) with high-temperature grease (item 14, Appendix C).

2. Using arbor press, install output flange oil seal (A) by pressing to bottom of bore (B).

END OF TASK



TA236539

INSTALLSPUR GEAR (STEER PINION)

TOOLS: Plastic insert hammer
Arbor press

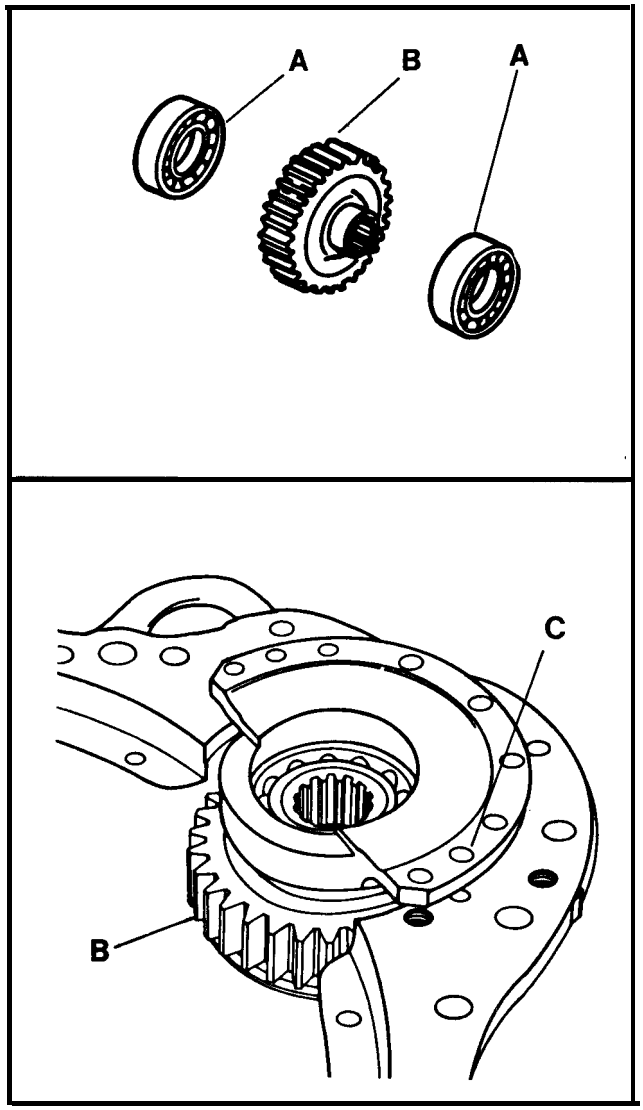
PRELIMINARY PROCEDURE: Install Output Flange Seal (Page 3-18)

1. Using arbor press, install bearings (A) on hub of steer pinion (B).

2. Using plastic insert hammer, install pinion and bearings into end cover.

3. Install bearing support (C) onto end cover. Using plastic insert hammer, tap bearing support (C) into place.

END OF TASK



TA236540

INSTALL SPUR GEARS (STEER OUTPUT GEAR, OUTPUT SUN GEAR)

TOOLS: 3/4-in. 1/2-in. drive socket
1/2-in. drive torque wrench
Hammer
Straight
Arbor press
Pry bar

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Install Steer Pinion (Page 3-19)

NOTE

The inner and outer races of the steer output gear bearing are a matched set and serial numbers must be matched for assembly.

1. Using arbor press, install bearing (A) outer race and rollers, serial numbered side first, into steer output gear (B).

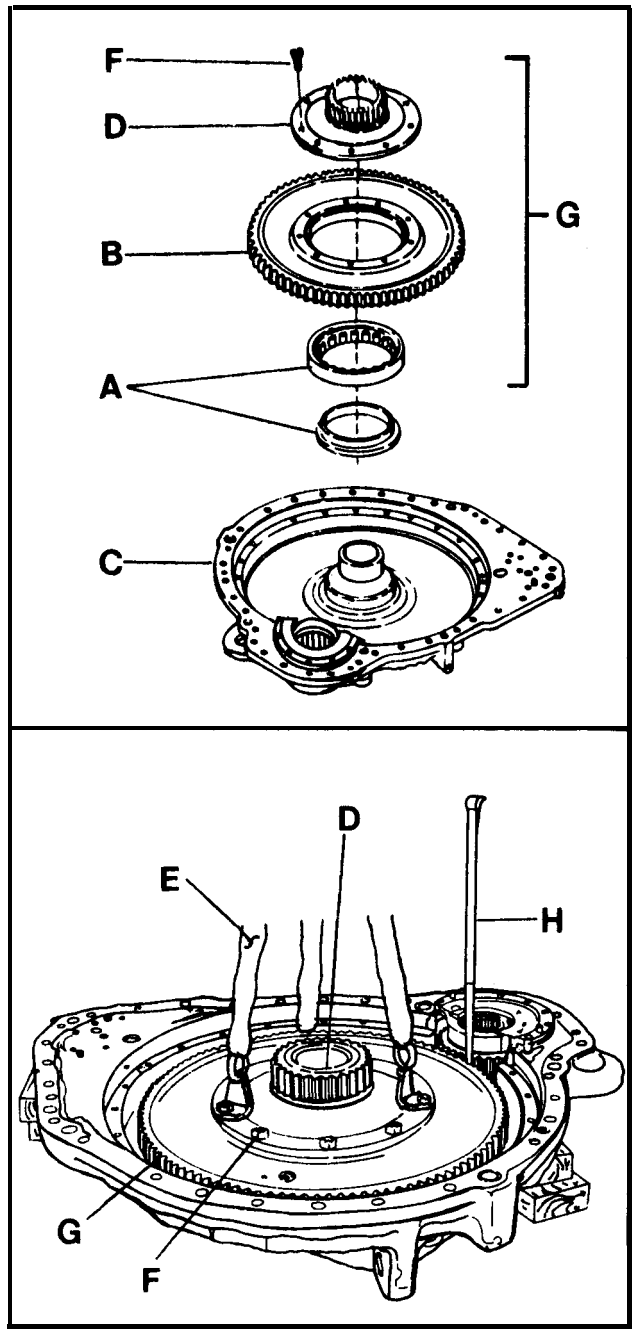
2. Using hammer and straight, install bearing (A) inner race, serial numbered side upward, onto end cover output hub (C). Install steer output gear (B), with bearing (A) outer race and rollers, onto bearing (A) inner race and onto end cover hub (C).

3. Install output sun gear hub (D) onto steer output gear (B). Install sling (E) with three bolts (F). Install remaining nine bolts (F).

4. Using sling, install steer output gear assembly (G) into end cover. Remove sling and hoist. Install three remaining bolts (F).

5. Using pry bar (H) to prevent gear rotation and using socket and torque wrench, tighten twelve bolts (F) to 96 to 115 lb-ft (130 to 156 N.m).

END OF TASK



TA236541

INSTALL BRAKE ANCHOR (Sheet 1 of 2)

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
Plastic insert hammer
External retaining ring pliers
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Thimble, P/N 7081614

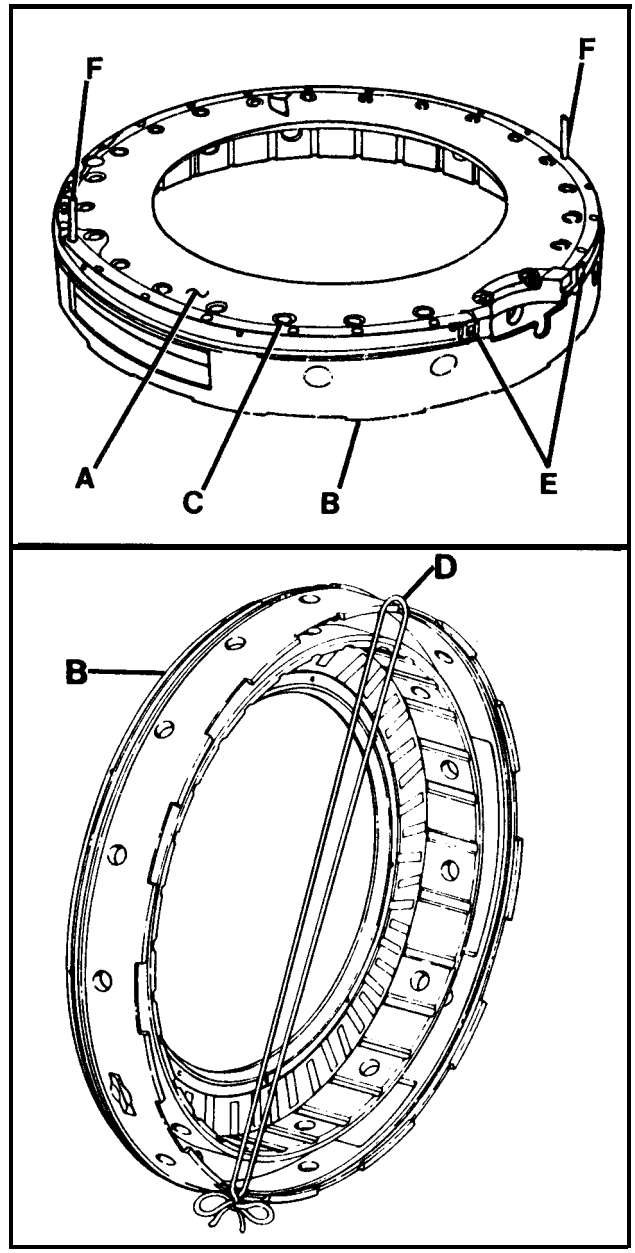
SUPPLIES: 3/8-24 X 4-in. guide bolt (two required)

PERSONNEL: Two persons recommended

PRELIMINARY PROCEDURE: Install Steer Output Gear and Output Sun Gear (Page 3-20)

1. Using plastic insert hammer, install pressure plate (A) on brake anchor (B). Install 24 bolts (C).
2. Using socket and torque wrench, tighten 24 bolts (C) to 41 to 49 lb-ft (56 to 66 N•
3. Measure a loop of oil seal (D) approximate diameter of brake anchor (B) and tie two ends in a knot. Stretch seal sufficiently to install in groove in OD of anchor with knot in center of steer pinion slot. Be sure seal does not protrude beyond slot. If it does, tie knot tighter so it will be stretched more. Apply a coat of oil to seal.
4. Install bumpers (rubber plugs) (E).
5. Install two 3/8-24 x 4-inch guide bolts (F) into brake anchor (B).

Go on to Sheet 2.



TA 272394

INSTALL BRAKE ANCHOR (Sheet 2 of 2)

6. Position anchor (B) on end cover (G) with steer pinion slot and bolt holes alined. Tap with plastic hammer to seat in end cover.

7. Using hoist attached to end cover lifting eye, raise cover (G) to near vertical position

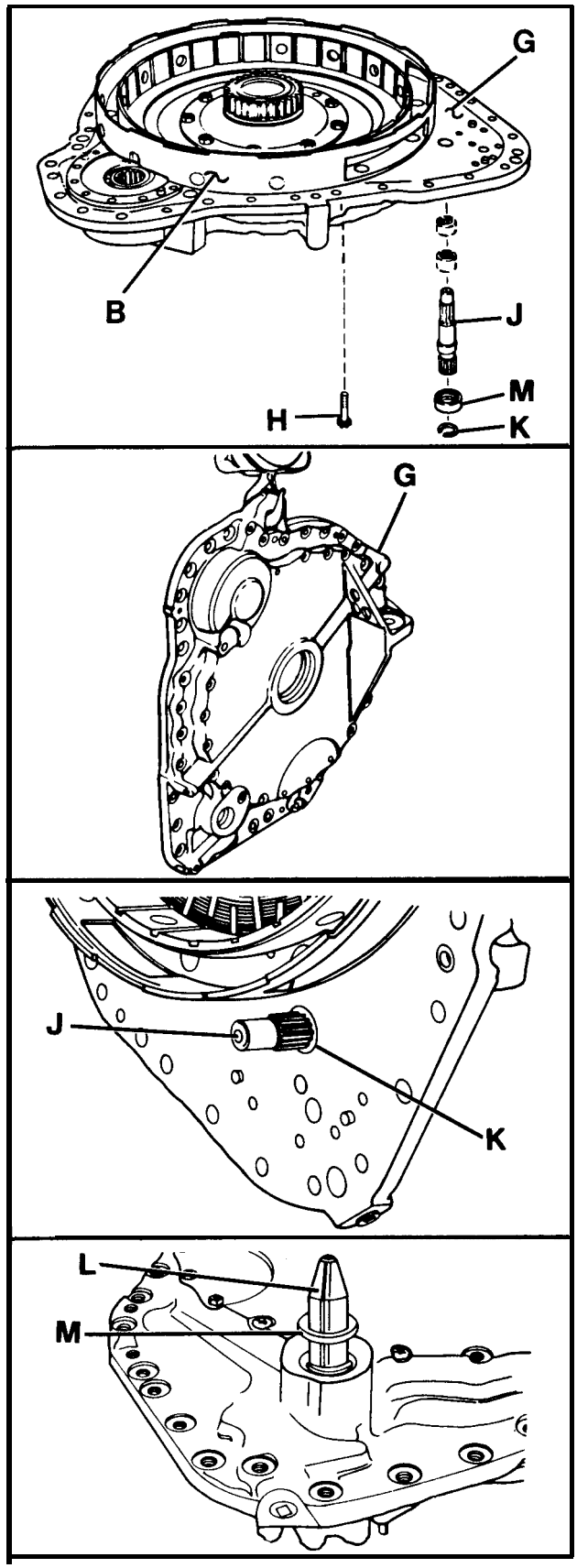
8. Install 21 bolts (H) through end cover (F) and into brake anchor (B). Using socket and torque wrench, tighten bolts (H) to 41 to 49 lb-ft (56 to 66 N·m).

9. Insert brake apply shaft (J). Using external retaining ring pliers, install retaining ring (K).

10. If removed, use thimble (L) to install seal (M).

11. Lower end cover (G) back to work surface. Cut knot, leaving approximately 1-1/2-inch of seal at each end. Remove excess oil seal.

END OF TASK



TA 272386

ASSEMBLE BRAKE HUBANDOUTPUT PLANETARY CARRIER

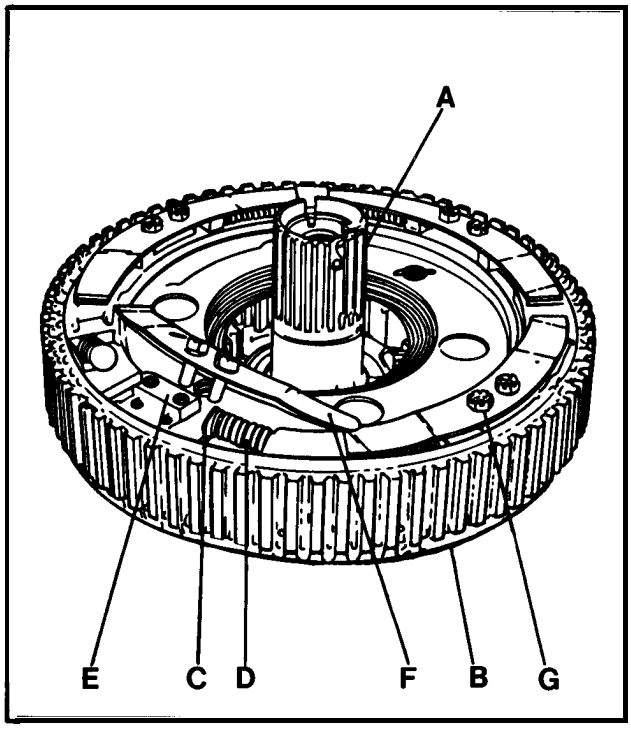
TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE Install Brake Anchor (Page 3-21)

1. Position output planetary carrier (A) on blocks. Install brake hub (B) on carrier (A).
2. Assemble 16 damper buttons (C) in eight springs (D).
3. Install springs and damper buttons in tangs of brake hub (B).
4. Install four spring support blocks (E), flexible hub springs (F), and eight bolts (G).
5. Using socket and torque wrench, tighten eight bolts (G) to 41 to 49 lb-ft (56 to 66 **N.m).**

END OF TASK



TA272395

INSTALL BRAKE HUB AND BRAKE PLATES

TOOLS: Hoist, 2-ton minimum capacity
Flat-tip screwdriver
Pry bar
5/8-in. 1/2-in. drive socket
1/2-in. drive torque wrench

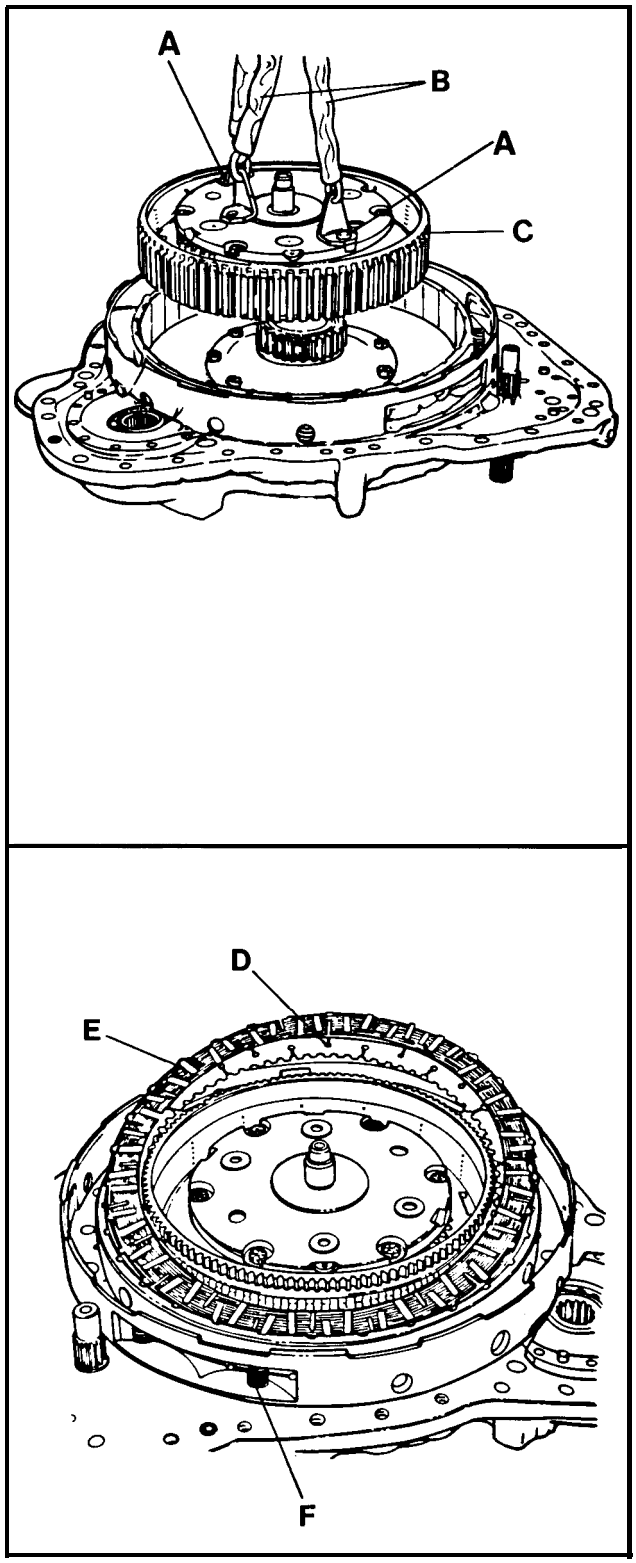
SPECIAL TOOLS: Lifting sling, P/N 7073778

SUPPLIES: 7/16-20 x 2-in. bolt (two required)

PRELIMINARY PROCEDURE: Assemble Brake Hub and Output Planetary Carrier (Page 3-23)

1. Invert brake hub and output planetary carrier assembly.
2. Remove two directly opposite bolts (A).
3. Using two 7/16-20 x 2-inch bolts, attach lifting sling (B) to brake hub (C).
4. Using hoist, raise assembly and lower it into end cover with output shaft in bearings and planetary pinions alined with output sun gear. Remove sling (B) and replace original bolts (A).
5. Use pry bar to prevent rotation of steer gears. Use screwdriver to prevent rotation of carrier gears. Using socket and torque wrench, tighten bolts (A) to 64-77 lb ft (87-104 N.m).
6. Alternately install seven internally splined steel plates (D) and six externally tanged brass plates (E), starting and ending with a steel plate.
7. Install 12 brake release springs (F) into brake anchor.

END OF TASK



TA 272381

ASSEMBLE AND INSTALL CAM RINGS AND PISTON (Sheet 1 of 2)

TOOLS: Flat-tip screwdriver
Machinist's hammer
5/16-in. center punch
9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
Plastic-insert hammer

PRELIMINARY PROCEDURE: Install Brake Hub and Brake Plates (Page 3-24)

1. Install baffle (A), inner lip downward, into piston (B). Install bronze pressure plate (C), smooth side downward, into piston (B).

2. Using screwdriver, install four screws (D) securely. Using hammer, and punch, peen ends of screws (D) on pressure plate side.

3. Place rotating cam ring (E) on work surface with cam side downward. Insert assembled piston into rotating cam ring.

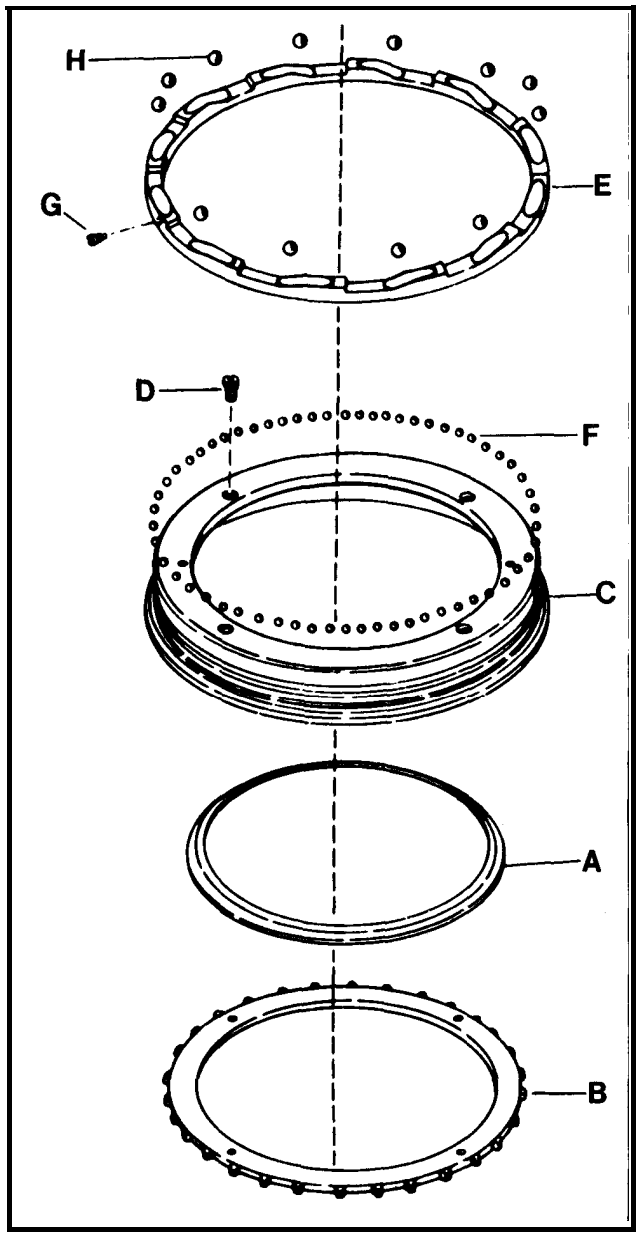
4. Install exactly 247 1/4-inch bearing balls (F) in channel between ring and piston. Use petrolatum (item 13, Appendix C) to hold bearing balls in place.

5 Lift cam ring and install two setscrews (G). Using screwdriver tighten setscrews (G).

6. Invert assembly and install it in brake hub. Index rotating cam ring so that -A- line on cam ring alines with brake adjustment line on brake anchor.

7. Install twelve 11/16-inch bearing balls (H) in pockets on rotating cam ring (E).

Go on to Sheet 2.

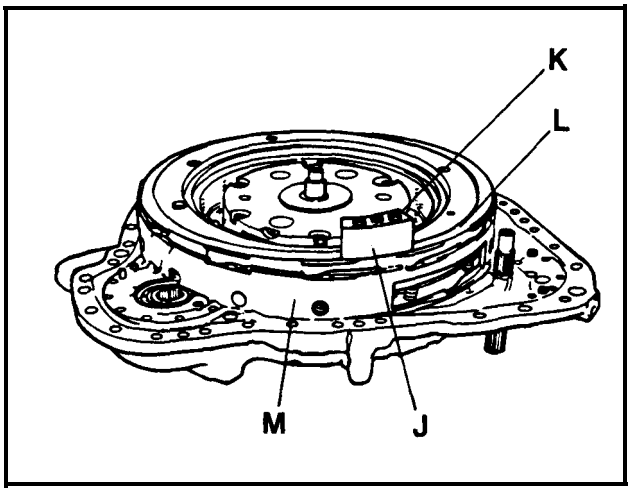


TA236546

ASSEMBLE AND INSTALL CAM RINGS AND PISTON (Sheet 2 of 2)

8. Install ring block (J) and three bolts (K) on stationary cam ring (L). Using socket and torque wrench tighten three bolts (K) to 36-43 lb-ft (49-58 N.m).

9. Install stationary cam ring (L) on brake anchor (M). Press down on ring to compress return springs so that stationary cam ring tabs can be engaged in brake anchor and tabs on pressure plate can be engaged with splines on hub. Tap on ring block with plastic insert hammer to rotate ring until marks made before disassembly are alined.



END OF TASK

TA236547

INSTALL BRAKE APPLY COMPONENTS (Sheet 1 of 2)

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
Flat-tip screwdriver
Diagonal pliers
Machinist's hammer
Plastic insert hammer

SPECIAL TOOLS: Needle bearing replacer, P/N 7082980
Handle, P/N 7082416

PRELIMINARY PROCEDURE Assemble and Install Cam Rings and Piston (Page 3-25)

1. Install bracket (A) and three bolts (B). Using plastic insert hammer, tap ring block to gain access to bolts for socket. Using socket and torque wrench, tighten bolts (B) to 41 to 49 lb-ft (56 to 66 N.m).

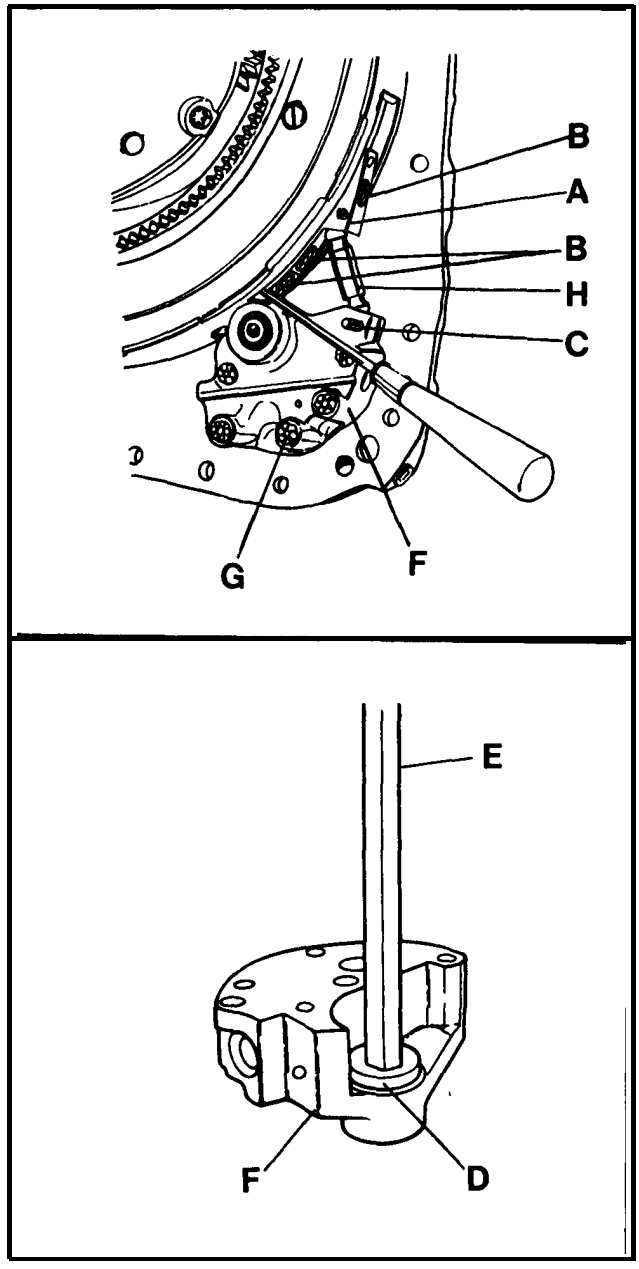
2. Install brake apply lever (C) on brake apply shaft, alining pin in lever with missing spline on shaft.

3. If removed, use replacer (D) and handle (E) with hammer to install needle bearing in brake apply shaft bracket (F).

4. Install bracket (F) and five bolts (G). Using socket and torque wrench, tighten five bolts (G) to 41 to 49 lb-ft (56 to 66 N.m).

5. Using screwdriver, as necessary, to rotate cam ring, install brake apply strut (H).

Go on to Sheet 2.



TA236548

INSTALL BRAKE APPLY COMPONENTS (Sheet 2 of 2)

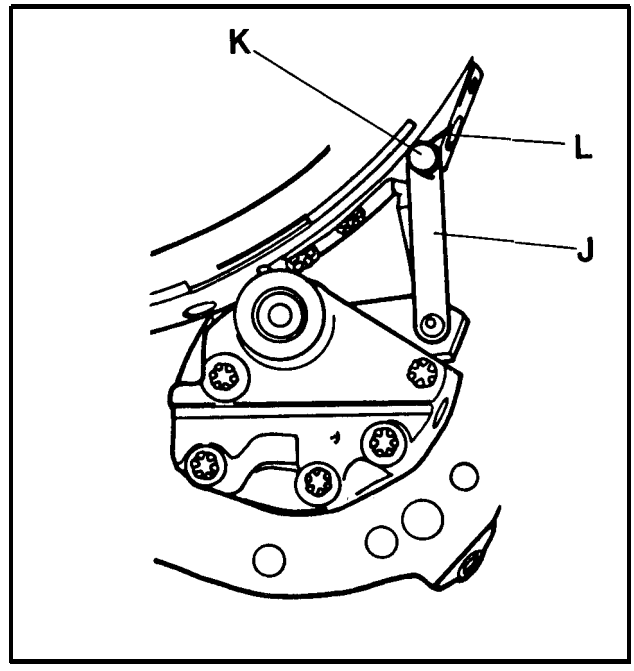
NOTE

Be sure to center strut retainer (J) and spring washer on retainer bolt (K) during installation.

6. Install brake apply strut retainer (J), spring washer, and retainer bolt (K). Using socket and torque wrench, tighten bolt to approximately 11 to 13 lb-ft (15 to 18 N.m).

7. Install lock wire (L) through retainer bolt (K). Using pliers trim excess lock wire (L).

END OF TASK



TA236549

INSTALL BRAKE RETURN CAM COMPONENTS

TOOLS: 1/2-in. drive torque wrench
9/16-in. crowfoot
Flat-tip screwdriver

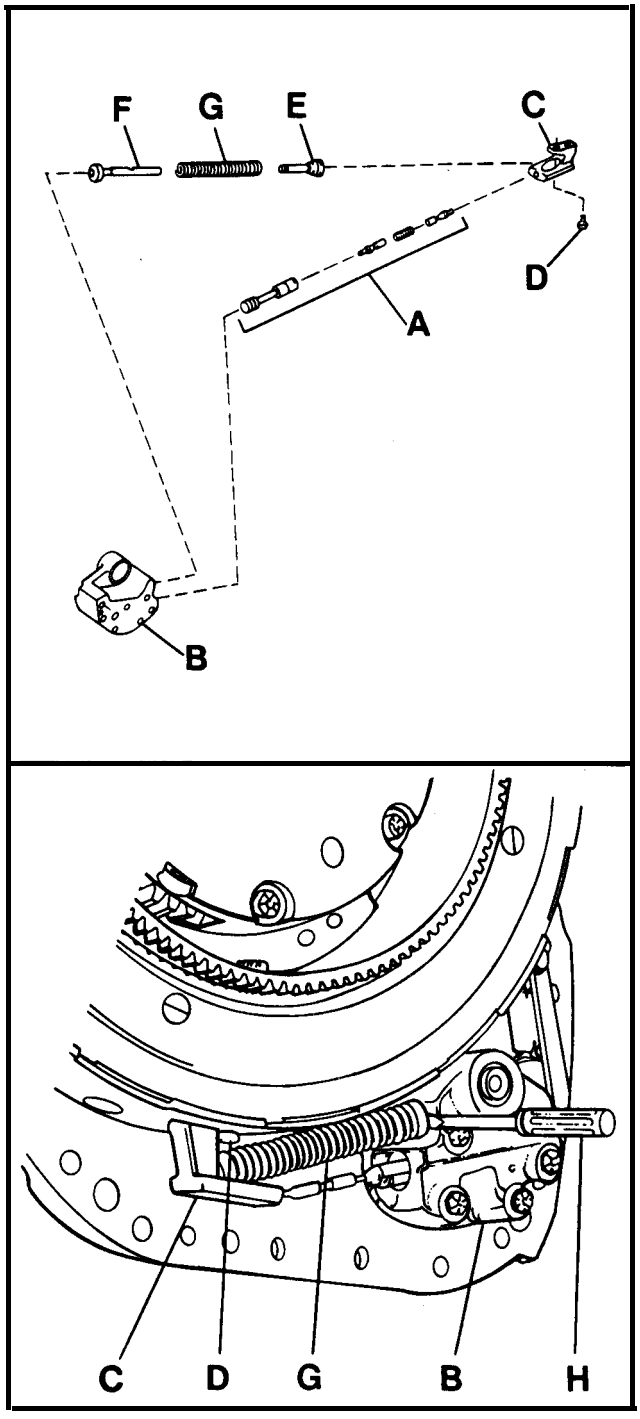
PRELIMINARY PROCEDURE: Install Brake Apply Components (Page 3-27)

NOTE

If cooling oil valve linkage (A) requires replacement, adjust during installation. Adjust ball joints and stud until scribe line on valve alines with edge of bore in brake apply bracket (B). Secure by crimping ends of ball joints on flat of connecting shaft.

1. Install cam return bracket (C) with linkage and valve attached, and bolt (D).
2. using crowfoot and torque wrench, tighten bolt (D) to 41 to 49 lb-ft (56 to 66 N.m).
3. Assemble spring guide pin (E) and seat assembly (F) into spring (G).
4. Install spring assembly between cam return bracket (C) and brake apply bracket (B). Use screwdriver (H) to compress spring for installation. The end of the spring, with seat assembly (F), is installed onto brake apply bracket (B).

END OF TASK



TA236550

INSTALL BRAKE ADJUSTMENT COMPONENTS

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
Internal retaining ring pliers

PRELIMINARY PROCEDURE: Install Brake Return Cam Components (Page 3-29)

1. Assemble brake adjustment bolt (A), washer (B) and worm gear (C) and install them in bracket (D).

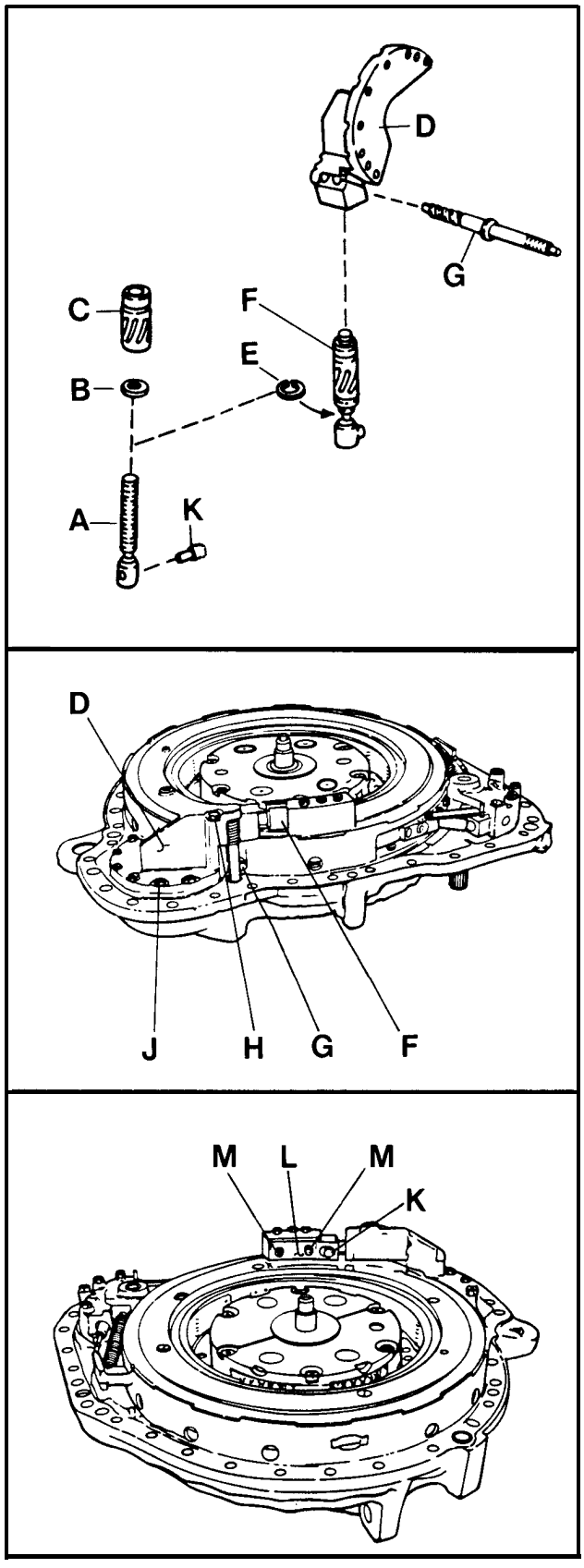
2. Using internal retaining ring pliers, install retaining ring (E) to secure bolt assembly (F) to bracket (D).

3. Install worm shaft (G) and washer in bracket assembly (D).

4. Install bracket assembly, cap screw (H) and six bolts (J). Using socket and torque wrench, tighten six bolts (J) to 41-49 lb-ft (56 to 66 N.m) and cap screw (H) to 33 to 40 lb-ft (45 to 54 N.m).

5. Engage pin (K) of brake adjustment worm gear. Install locator plate (L) and two bolts (M). Using socket and torque wrench, tighten two bolts (M) to 38 to 43 lb-ft (49 to 58 N.m).

END OF TASK



TA236551

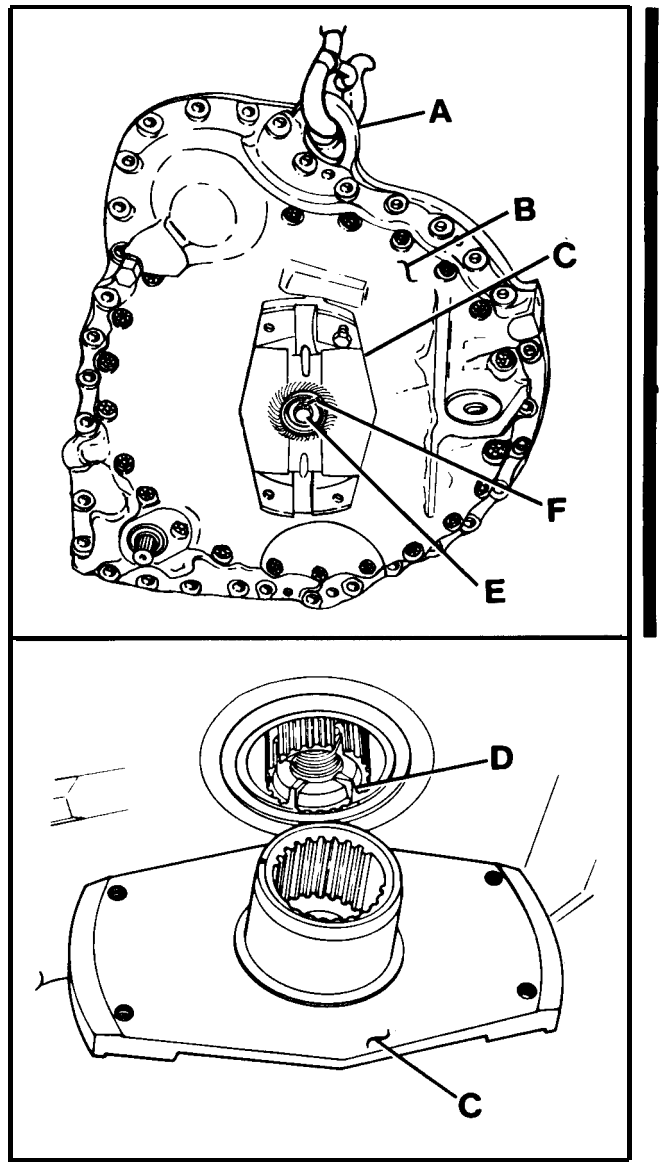
INSTALL THRUST WASHER BEARING (OUTPUT FLANGE), SLEEVE NUT (BRAKE ADJUSTMENT WORM CAP), AND LOCKNUT (Sheet 1 of 2)

TOOLS: 7/8-in. 1/2-in. drive socket
1/2-in. drive torque wrench
7/16-in. open end wrench
15/16-in. box wrench
1-in. box wrench
Diagonal pliers
Chisel
Hoist, 2-ton minimum capacity
Machinist's hammer

PRELIMINARY PROCEDURE: Install Brake Adjustment Components (Page 3-30)

1. Attach hoist to lifting eye (A) and raise end cover assembly (B) to near vertical position.
2. Aline -0- mark on output flange (C) with -0- mark on output shaft (D) and install flange (C) on shaft (D) to nearest spline.
3. Install washer and screw (E) on output shaft (D). Using socket and torque wrench, tighten screw (E) to 150 to 200 lb-ft (203 to 271 N·m).
4. Using pliers, install lock wire (F) to secure screw (E) and trim excess.

Go on to Sheet 2.



TA 272383

INSTALL THRUST WASHER BEARING (OUTPUT FLANGE), SLEEVE NUT (BRAKE ADJUSTMENT WORM CAP), AND LOCKNUT (Sheet 2 of 2)

NOTE

If a new brake anchor was installed in the transmission, perform the following adjustment procedure.

5. Lower end cover assembly (B) onto work surface.

6. Observe two parallel lines scribed on cam (G) that can be seen through rectangular opening in brake anchor (H). Move brake lever (J) to full release position.

7. Using sharp chisel, place mark (K) on brake anchor (H) alined with line marked -R-. This will be base line for all future adjustment.

NOTE

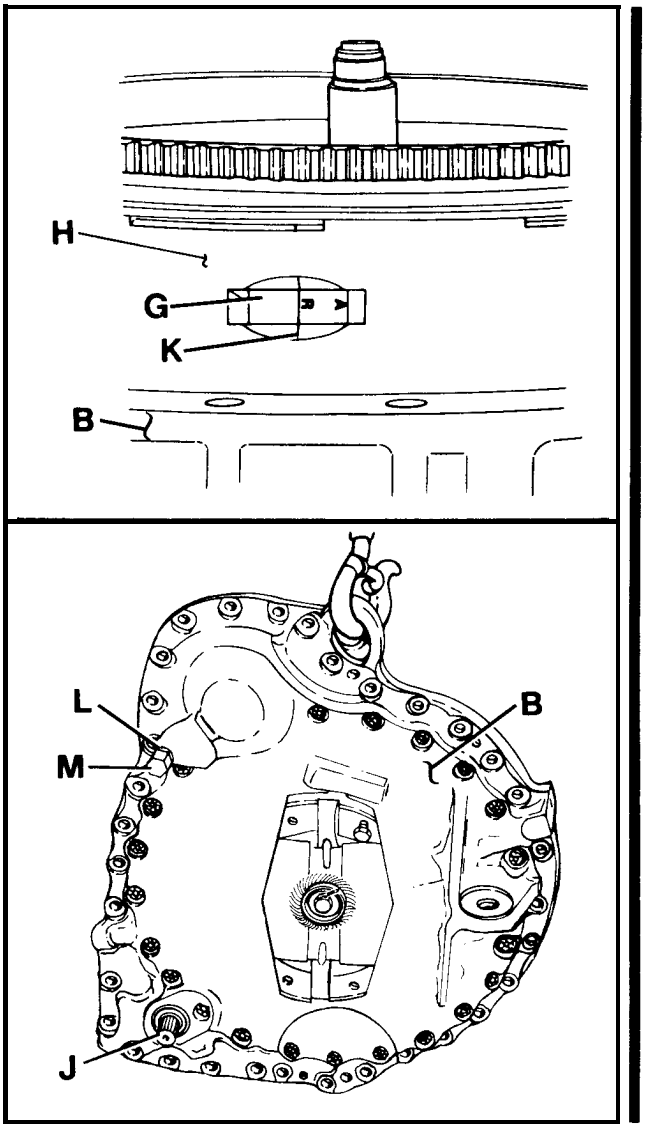
If new brake cam (G) wash installed, but old anchor (H) was used, check alinement of line -R- on cam (G) with chisel mark (K) on anchor (H). If alinement is within 1/32-inch, do not remark. If greater, peen old chisel mark closed and chisel new mark alined with -R- line.

8. Raise end cover assembly (B) to a near vertical position.

9. Using 7/16-inch wrench, hold worm shaft steady while using 15/16-inch wrench to install worm locknut (L).

10. Using 1-inch wrench, tighten worm cap (M) securely.

END OF TASK



TA 272384

Section III. FRONT MECHANICAL HOUSING

3-10 OVERVIEW

Procedures have been provided for complete disassembly, repair, and reassembly of the front housing assembly. Disassemble only to the extent necessary to accomplish the required repair.

DISASSEMBLY (Sheet 1 of 2)

TOOLS: 1-in. box wrench
9/16-in. combination wrench
9/16-in. 1/2-in. drive socket
1/2-in. 1/2-in. drive socket
1/2-in. drive breaker bar
1/2-in. drive 5-in. extension
Diagonal pliers
Internal retaining ring pliers
1/2-in. straight
1-11/16-in. 1/2-in. drive crowfoot
Machinist's hammer

PRELIMINARY PROCEDURE: Remove Front Housing Components (Page 2-43)

1. Using 9/16-inch socket, extension, and ratchet handle, remove ten bolts (A) and lockwashers (B) from oil filter assembly cap (C). If necessary, use two 1/4-20 bolts in threaded holes in oil filter assembly cap (C) to serve as jackscrews.

2. Remove oil filter assembly (D) and gasket (E).

3. Using diagonal pliers, remove two lock wires (F).

4. Using box wrench, remove two nuts (G). Remove two-washers (H) and filters (J).

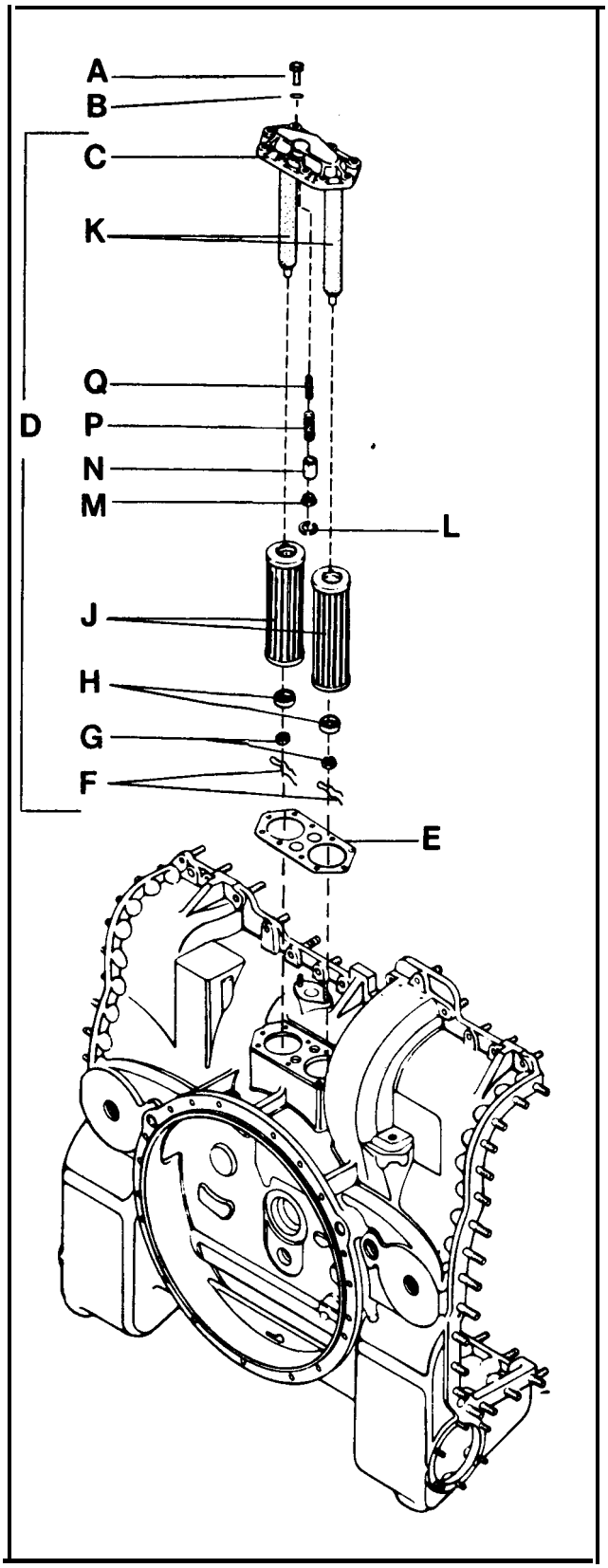
5. Using crowfoot and breaker bar, remove each tube assembly (K).

WARNING

Retaining ring (L) is under spring force. Use straight to hold valve while removing retaining ring (L).

6. Using straight to hold valve, use internal retaining ring pliers to remove spring-loaded retaining ring (L). Remove valve seat (M), valve (N), spring (P) and spring (Q).

Go on to Sheet 2.



TA236554

DISASSEMBLY (Sheet 2 of 2)

7. Using 9/16-inch socket and breaker bar, remove two nuts (R) and washers.

8. Remove vent cap (S) and gasket (T).

9. Using 1/2-inch socket and breaker bar, remove three bolts (U) that attach plate (V) to rear of front housing.

10. Remove oil transfer plate (V).

11. Remove oil jumper tube (W) from transfer plate (V).

12. Remove two preformed packings (X) from jumper tube (W).

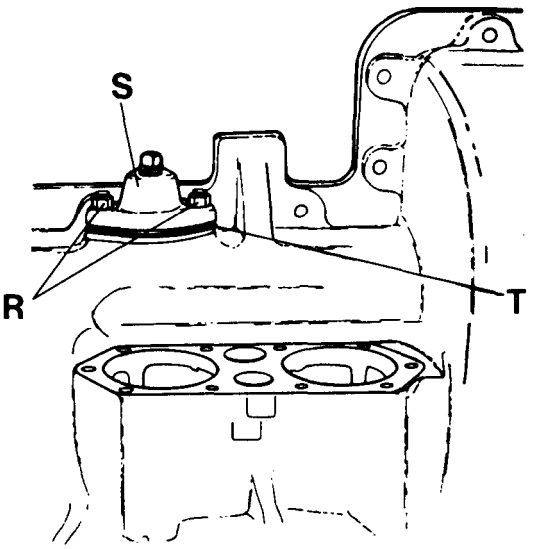
NOTE

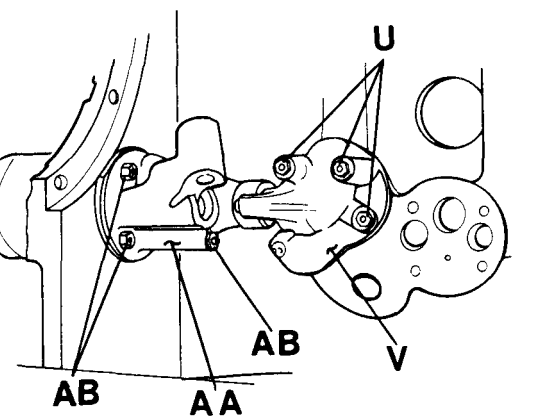
Remove output pump check valve (Y) and spacer (Z) from transfer bracket (AA) only if replacement is required.

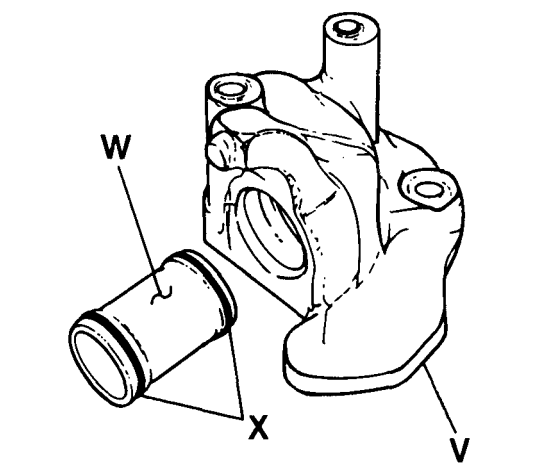
13. Using 9/16-inch combination wrench, remove four bolts (AB) that attach transfer bracket (AA) to rear of front housing. Remove oil and mount bracket on blocks.

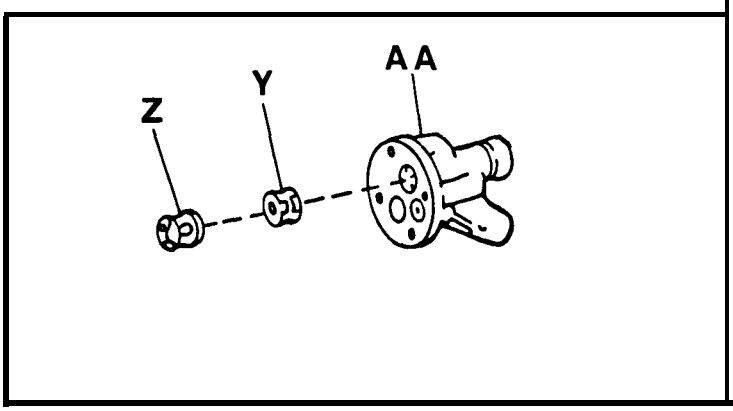
14. Using machinist's hammer and straight, remove check valve assembly (Y) and oil transfer spacer (Z) by tapping them until they fall out.

END OF TASK









TA236555

3-11 CLEANING

Clean all front housing assembly parts, as necessary, in accordance with page 2-17.

3-12 INSPECTION AND REPAIR (Sheet 1 of 2)

a. Refer to page 2-19 for general inspection and repair recommendations.

b. Additional repair procedures which may occasionally be necessary are provided below:

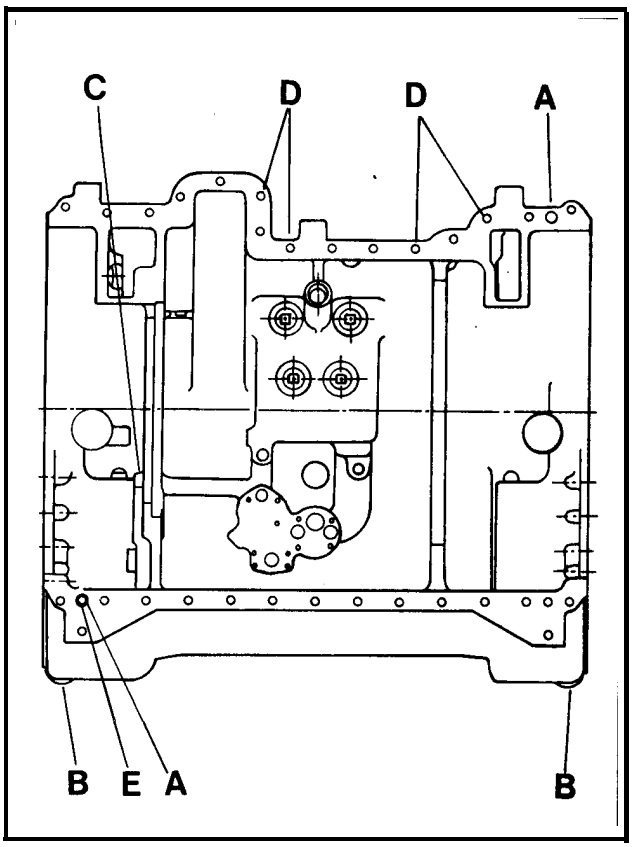
1. Procedure for replacement of damaged dowel pins (A) are provided on page 3-16.

2. If oil and drain plugs (B) are damaged or missing, replace them, using 1/2-inch 1/2-inch drive socket and breaker bar.

3. If 1/2-inch pipe plug (C) is damaged, use 1/4-inch breaker bar to remove. To install, use 1/4-to-3/8-inch adapter and 3/8-inch drive torque wrench to tighten to 240 to 480 lb-in. (27 to 54 N.m).

4. To replace four studs (D), use stud remover and setter and 1/2-inch drive ratchet handle. Torque to 15-65 lb-ft (20-88 N.m). If any stud can't be torqued to this value, use next oversize stud listed in Appendix B.

5. To install stud (E), torque to 15-33 lb-ft (20-45 N.m).



Go on to Sheet 2.

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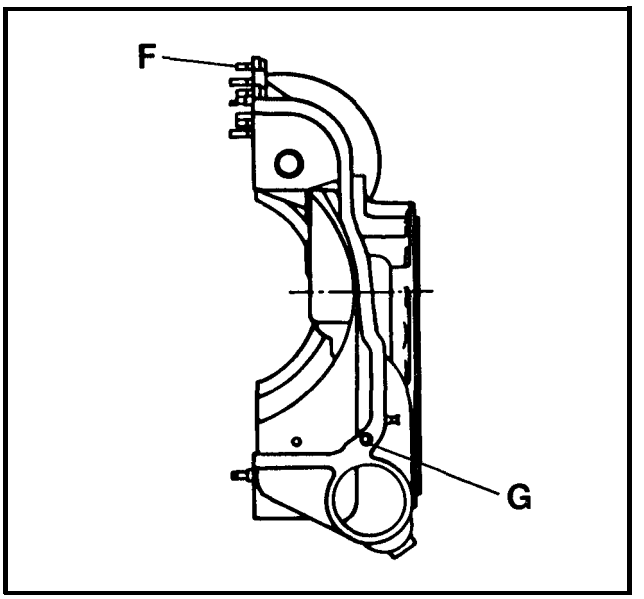
3-12 INSPECTION AND REPAIR (Sheet 2 of 2)

6. To replace any of 25 studs (F) proceed as in step 4.

7. To remove damaged tube (G) on either side of housing, use 11/16-inch tap and die set. Tap inside, insert bolt, and pull out with mechanical puller. To install, drive in with hammer and straight until tube protrudes 0.062 inch above surface.

END OF TASK



TA236557

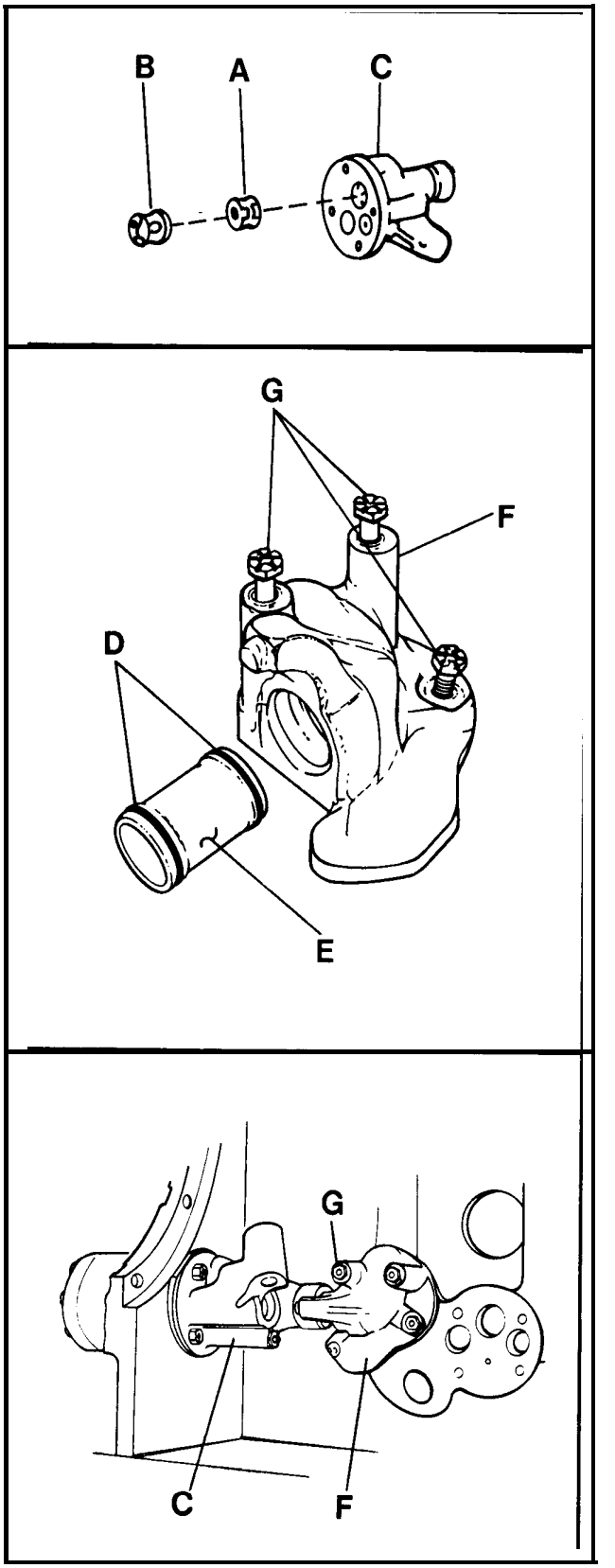
ASSEMBLY (Sheet 1 of 3)

TOOLS: 9/16-in. combination wrench
1-in. box wrench
9/16-in. 1/2-in. drive socket
1/2-in. 1/2-in. drive socket
1/2-in. drive torque wrench
1/2-in. drive 5-in. extension
9/16-in. 1/2-in. drive crowfoot
1-11/16-in. 1/2-in. drive crowfoot
Hand oiler
Machinist's hammer
Diagonal pliers
Straight
Internal retaining ring pliers

PRELIMINARY PROCEDURE: Disassembly (Page 3-34)

1. Using ham mer and straight, install check valve (A) and oil transfer spacer (B) in the oil transfer bracket (C).
2. Using 9/16-inch combination wrench, 9/16-inch crowfoot, extension, and torque wrench, install oil transfer bracket (C) and torque to 36-43 lb-ft (49-58 N.m).
3. Using hand oiler, oil per item 4, App. C, two preformed packings (D) on jumper tube (E).
4. Install jumper tube (E) in transfer plate (F)
5. Install transfer plate (F) and three bolts (G).
6. Using 1/2-inch socket and torque wrench, tighten three bolts (G) to 17 to 20 lb-ft (23 to 27 N.m), thereby attaching transfer plate to housing.

Go on to Sheet 2.



TA236558

ASSEMBLY (Sheet 2 of 3)

7. Install spring (H) and spring (J) into oil filter head (K). Install bypass valve (L), smaller outside diameter first, and valve seat (M), smaller outside diameter first, onto springs (H) and (J).

8. Depress items (H) through (M) and, using external retaining ring pliers, install retaining ring (N).

9. Using crowfoot, install oil filter tube assembly (P). Torque to 29-33 lb-ft (39-45 N.m).

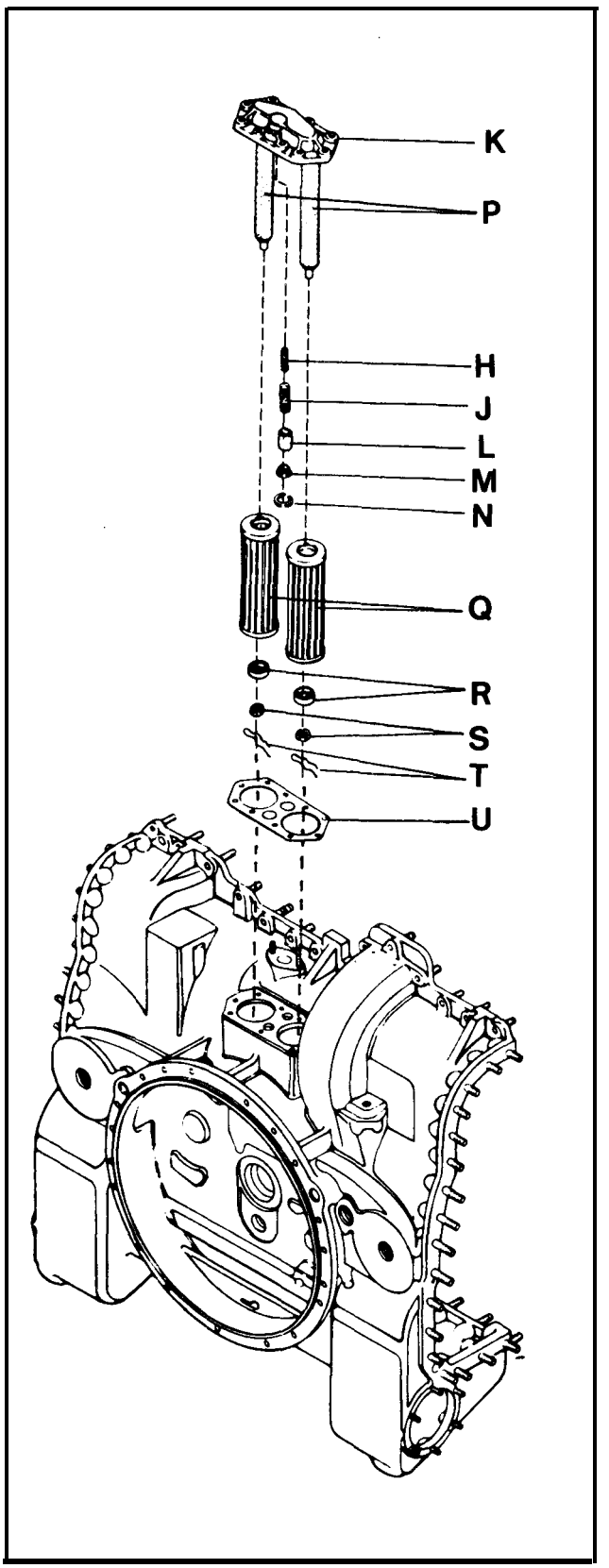
10. Install two filter elements (Q) recessed washers (R) open end first, and nuts (S) on tube assembly (P).

11. Using box wrench, lightly tighten two nuts (S) to approximately 2 to 3 lb-ft (3 to 4 N.m).

12. Safety wire two nuts (S), and using diagonal pliers trim safety wire (T).

13. Oil per item 4, App. C, and install gasket (U).

Go on to Sheet 3.



TA236559

ASSEMBLY (Sheet 3 of 3)

14. Install filter assembly (V), and ten washers and bolts (W).

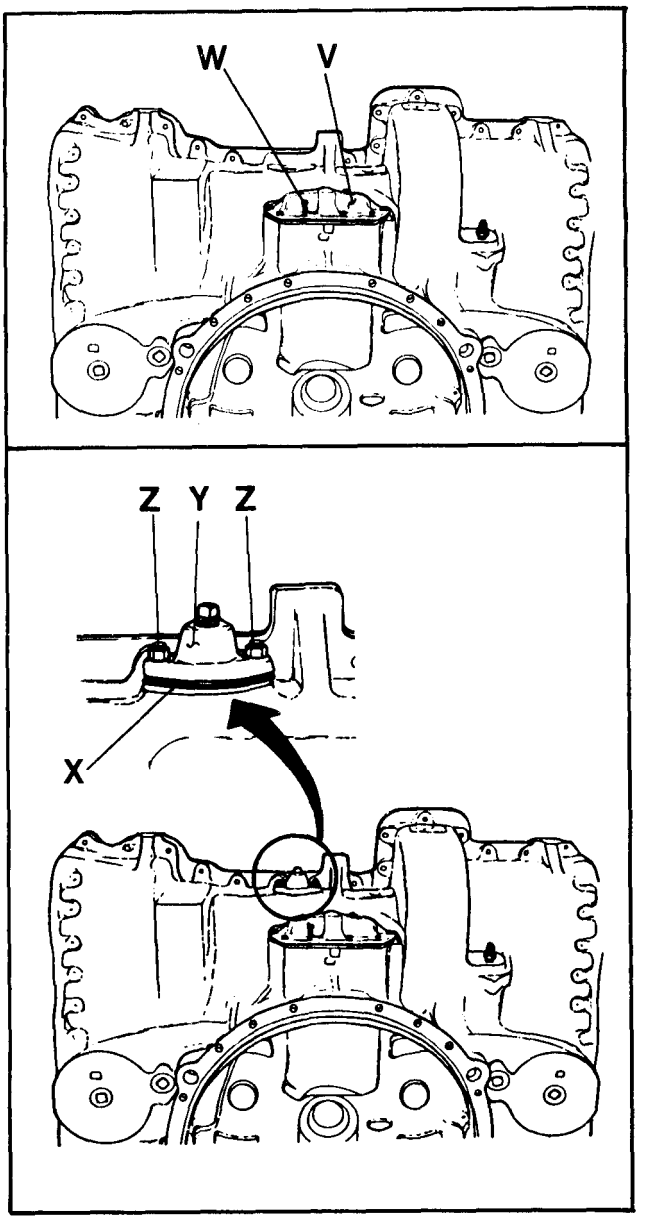
15. Using 9/16-inch socket, extension, and torque wrench, tighten ten bolts (W) to 26 to 32 lb-ft (35 to 43 N.m).

16. Oil gasket (X) with item 4, Appendix C.

17. Install gasket (X), vent cap (Y) and two washers and nuts (Z).

18. Using 9/16-inch socket and torque handle, tighten two nuts (Z) to 26 to 32 lb-ft (35 to 43 N.m).

END OF TASK



TA236560

Section IV. REAR MECHANICAL HOUSING

3-13 OVERVIEW

Procedures have been provided for complete disassembly, repair, and reassembly of the rear mechanical housing. Disassemble only to the extent necessary to accomplish the required repair.

DISASSEMBLY (Sheet 1 of 3)

TOOLS: 7/8-in. box wrench
5/8-in. 1/2-in. drive socket
9/16-in. 1/2-in. drive socket
1/2-in. 1/2-in. drive socket
1/2-in. drive 5-in. extension
1/2-in. drive breaker bar
Flat-tip screwdriver
Diagonal pliers
External retaining ring pliers
Internal retaining ring pliers
Machinist's hammer
Arbor press
Hoist, 2-ton minimum capacity
Chisel

SPECIAL TOOLS: Lifting sling, P/N 7083778

PERSON NEL Two persons required

PRELIMINARY PROCEDURE: Remove Inner Unit (Page 2-49)

1. Remove six oil jumper tubes (A). Remove 12 seal rings (B), one from each end of each jumper tube.

2. Using hammer and chisel, unlock retainer plate (C) by bending tabs away from bolt heads.

3. Using 1/2-inch socket, extension, and breaker bar, remove two bolts (D).

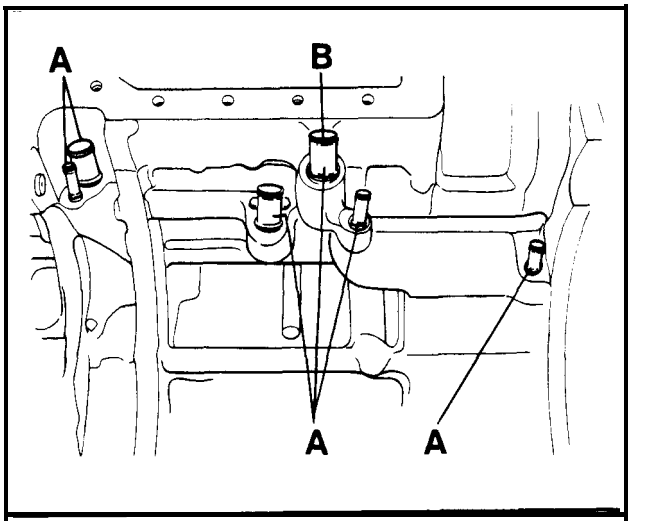
4. Remove retainer plate (C), retainer (E), spring (F), and check valve (G).

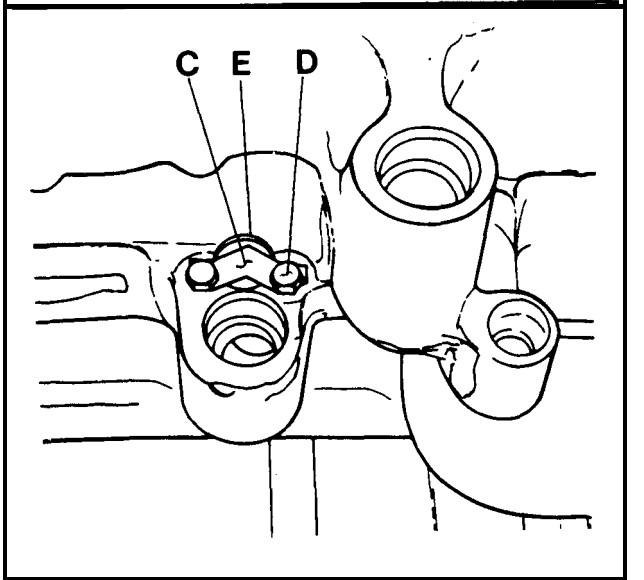
NOTE

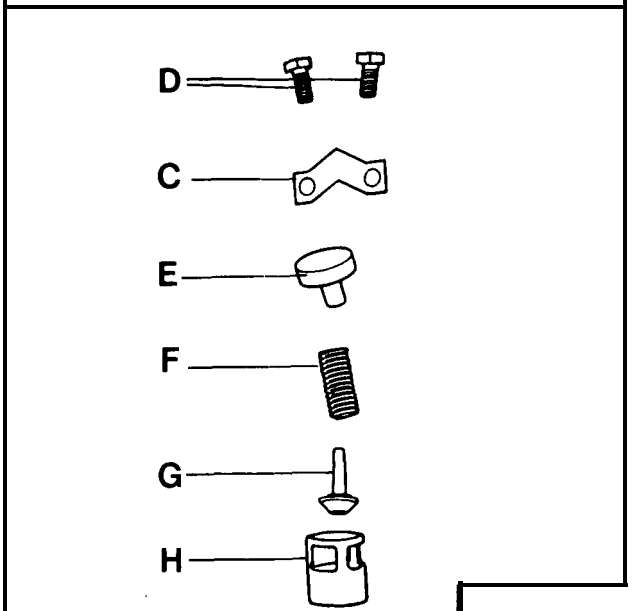
Do not remove check valve body (H) unless it requires replacement.

5. Using internal retaining ring pliers, remove check valve body (H).

Go on to Sheet 2.







TA236561

DISASSEMBLY (Sheet 2 of 3)

NOTE

Linkage for the low- and reverse-range servo is identical. The following procedure covers removal of linkage for one servo. Repeat entire procedure for other servo.

6. Using screwdriver, remove retaining ring (J) by prying it out. Remove servo lever shaft (K).

7. Lift servo lever (L) away from housing and rotate linkage 90 degrees.

8. Using external retaining ring pliers, remove retaining ring (M) and washer (N).

9. Push link pin (P) in flush with link (Q). Rotate linkage 180 degrees and then remove link pin (P) and remove lever and links.

10. Using external retaining ring pliers, remove retaining ring (R) and washer (S). Remove link pin (T) and two links (Q) from lever (U).

NOTE

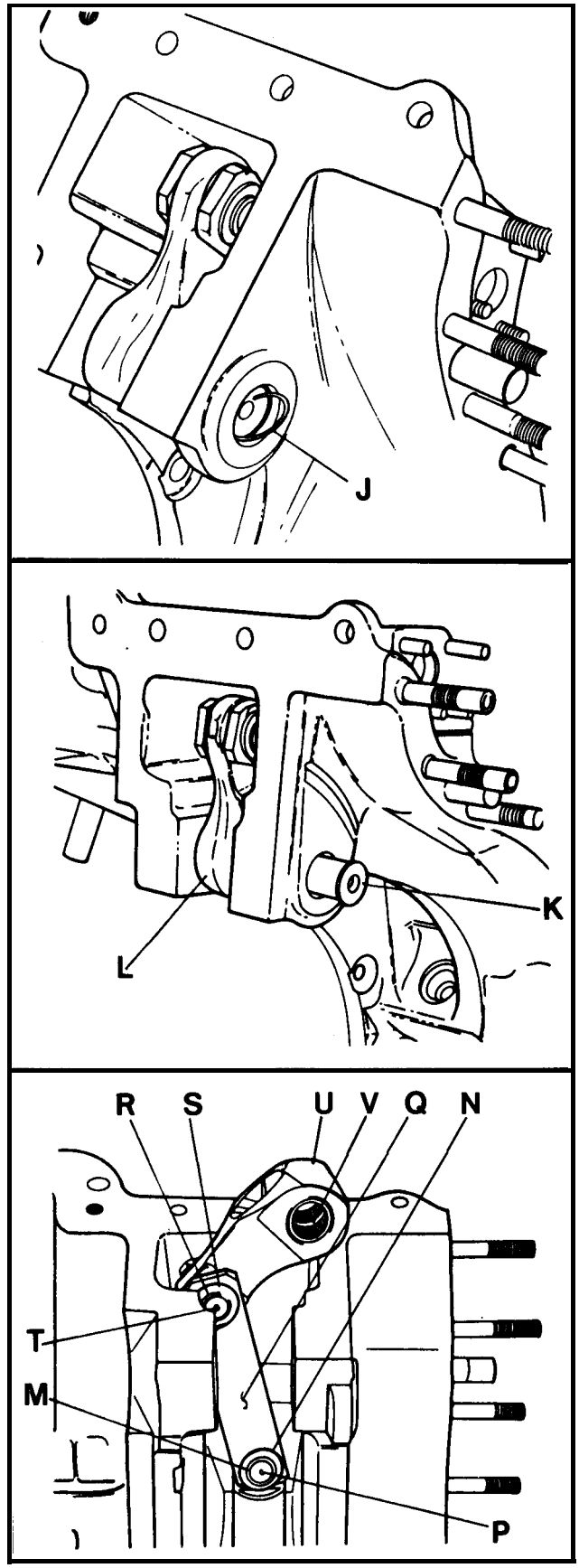
Do not remove needle bearing from servo lever (U) unless it requires replacement.

11. Using an arbor press, remove needle bearing (V) from servo lever (U).

NOTE

The low- and reverse-range servo pistons are identical. The following procedure covers removal of one piston. Repeat entire procedure for other piston.

Go on to Sheet 3.



TA236562

DISASSEMBLY (Sheet 3 of 3)

12. Attach lifting sling to rear housing. Attach sling to hoist and turn housing over onto splitline surface.

13. Using 9/16-inch socket and breaker bar, loosen 12 nuts (W). Leaving two nuts (W) 180 degrees apart, remove the other 10 nuts and washers.

14. Hold cover (X) against spring loading and remove remaining two nuts (W) and washers. Remove cover (X) and gasket.

15. Remove spring (Y) and piston (Z). Remove seal ring (AA) from piston (Z).

NOTE

Remove servo piston shaft sleeve only if replacement is necessary for repair purposes.

16. Using screwdriver, remove two screws (AB). Remove sleeve (AC).

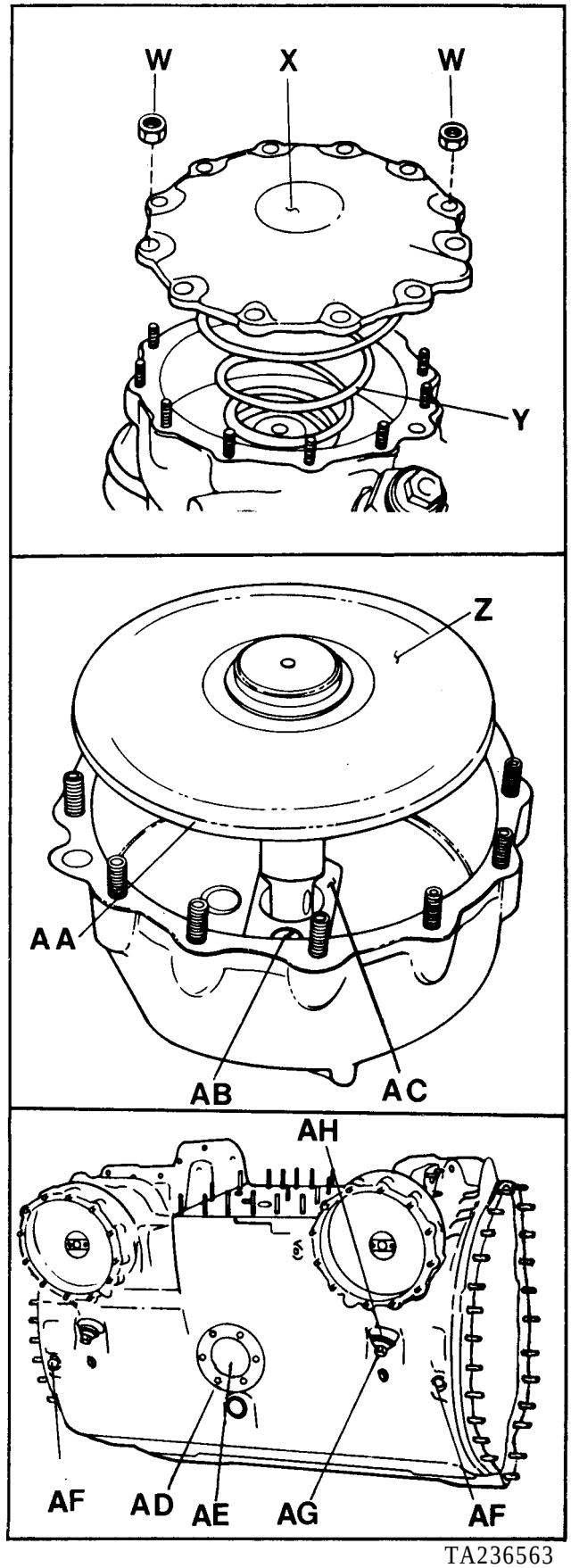
17. Using 5/8-inch socket and breaker bar, remove six capscrews (AD) and lockwashers. Remove cover (AE) and gasket.

18. Using diagonal pliers, remove safety wire from two plugs (AF).

19. Using box wrench, remove two plugs (AF) and gaskets.

20. Remove two lock nuts (AG), gaskets, and screws (AH) from band adjustments.

END OF TASK



TA236563

3-14 CLEANING

Clean all rear housing assembly parts, as necessary, in accordance with page 2-17.

3-15 INSPECTION AND REPAIR

a. Refer to page 2-19 for general inspection and repair recommendations.

b. Additional repair procedures which may occasionally be necessary are provided below:

1. Using Coil Thread Insert Tool Kit, install inserts asneeded (there are six under the power take-off cover).

2. Use 1/2-inch drive breaker bar and 5-inch extension to remove 3/4-inch pipe plugs at left side, rear, if damaged. Using torque wrench, replace by tightening to 50-60 lb-ft (68-81 N.m).

3. Use hammer and straight to replace two tubes located under check valve shown on page 3-35. The top one is staked.

4. Use hammer and straight to install missing or damaged dowel pins so that they extend 1-1/4-inch above mating surface of housing.

5. Use stud remover and setter and 1/2-inch drive handle when replacing studs. Using torque wrench, tighten the following studs to 10-37 lb-ft (14-50 N.m): P/N's 7767552, 7767553, 7707818, 7767768, and 8355713. Tighten the following studs to 15-65 lb-ft (20-88 N.m): P/N's 7767579, 7767580, and 7707874. If any stud can't be torqued to the correct value, use the next oversize stud listed in Appendix B.

ASSEMBLY (Sheet 1 of 4)

TOOLS: 9/16-in. 1/2-in. drive socket
5/8-in. 1/2-in. drive socket
1/2-in. drive torque wrench
Diagonal pliers
Flat-tip screwdriver
External retaining ring pliers
Hoist, 2-ton minimum capacity
Plastic insert hammer

SPECIAL TOOLS: Lifting sling, P/N 7083778
Needle bearing replacer, P/N 7082480

PERSONNEL: Two persons required

Preliminary PROCEDURE: Disassembly (Page 3-42)

1. Apply nonhardening sealer (item 30, Appendix C) to threads of two band adjustment screws (A). Install two screws (A) but only screw in part way.

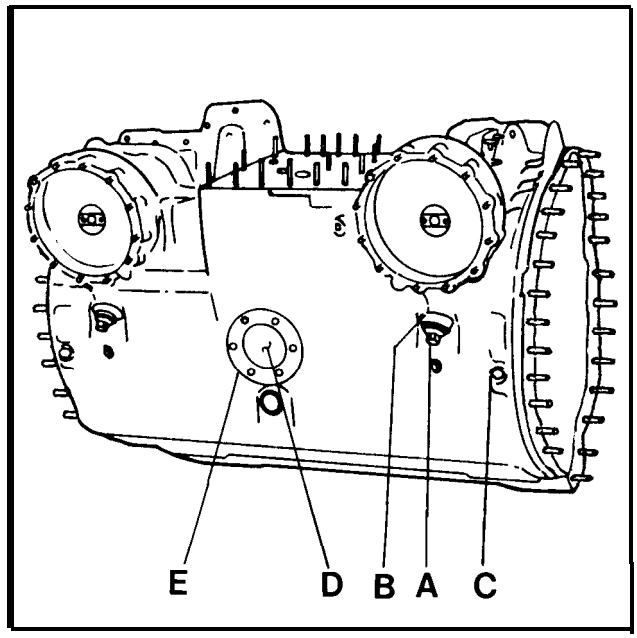
2. Install two gaskets and locknuts (B) on screws (A). Do not tighten locknuts at this time.

3. Oil two gaskets with item 4, Appendix C and install them and two brake inspection plugs (C). Do not tighten and safety wire plugs at this time.

4. Oil and install gasket and install power take-off cover (D), and six lockwashers and capscrews (E).

5. Using 5/8-inch socket and torque wrench, tighten six capscrews (E) to 20 to 25 lb-ft (27 to 34 N.m).

Go on to Sheet 2.



TA236564

ASSEMBLY (Sheet 2 of 4)

NOTE

The low- and reverse-range servo pistons are identical. The following procedure covers installation of one piston. Repeat entire procedure for other piston.

6. Using plastic insert hammer, install piston shaft sleeve (F). Install two screws (G).

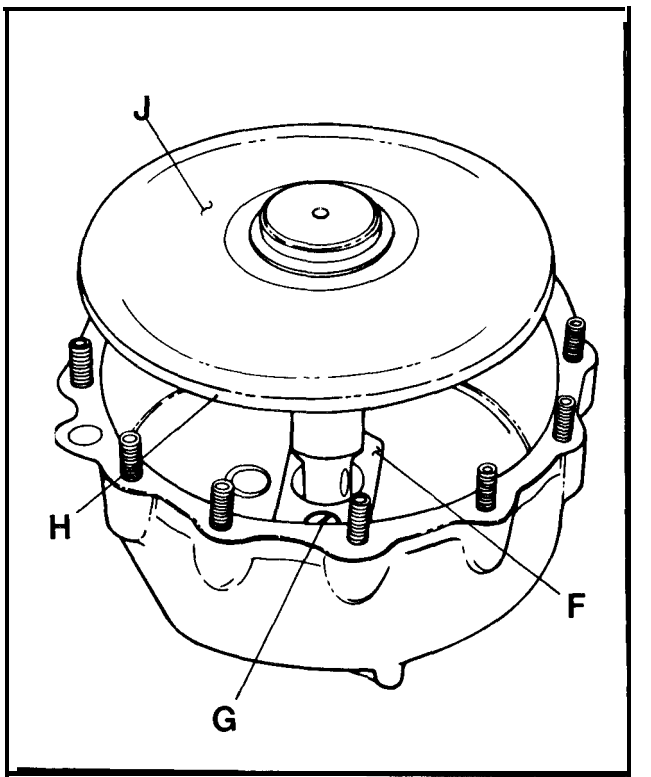
7. Using screwdriver and torque wrench, tighten two screws (G) to 26 to 32 lb-ft (35 to 43 N.m).

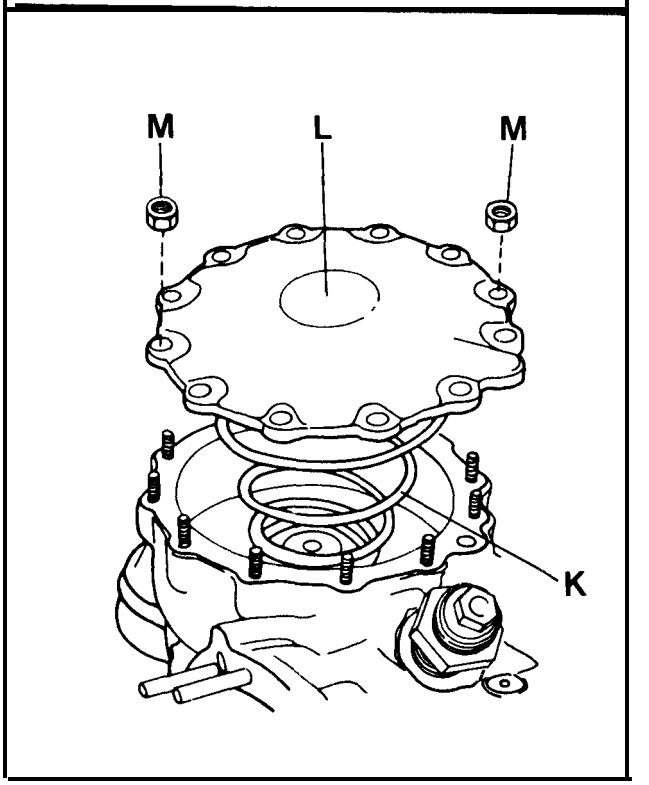
8. Oil with item 4, Appendix C and install seal ring (H) on piston (J). Install piston (J) and spring (K).

9. Oil with item 4, Appendix C and aline and install gasket and cover (L). Aline and hold cover (L) against spring pressure while installing two washers and nuts (M) 180 degrees apart. Install remaining ten washers and nuts (M).

10. Using 9/16-inch socket and torque handle, tighten 12 nuts (M) to 26 to 32 lb-ft (35 to 43 N.m).

Go on to Sheet 3.





TA236565

ASSEMBLY (Sheet 3 of 4)

11. Attach hoist to sling and turn rear housing, splitline upward.

NOTE

Linkage for low- and reverse-range servo is identical. The following procedure covers installation of linkage on one servo. Repeat entire procedure for other servo.

12. If needle bearing was removed, use needle bearing replacer to press bearing (N) into servo lever (P).

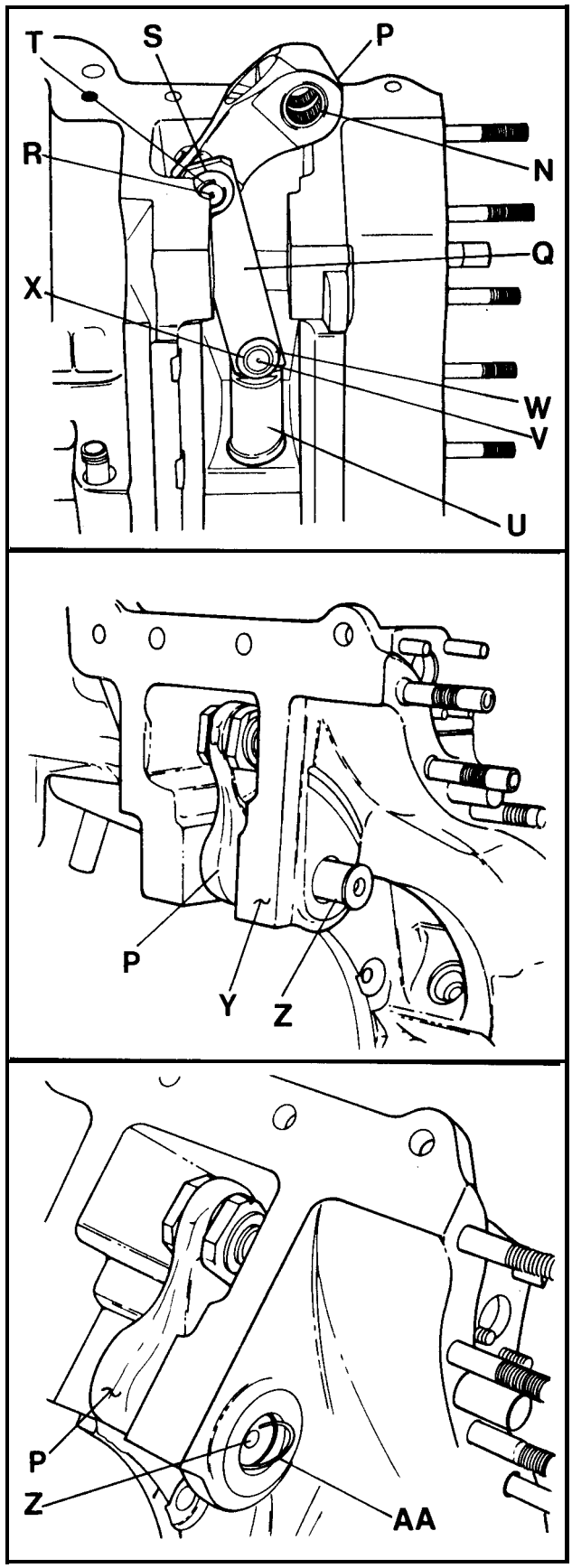
13. Install two links (Q) and link pin (R) and washer (S) on servo lever (P). Using external retaining ring pliers, install retaining ring (T) on link pin (R).

14. Position links (Q) on servo lever shaft (U) and install link pin (V). Rotate linkage assembly 180 degrees and install washer (W) on link pin (V). Hold pin (V) with screwdriver and, using external retaining ring pliers, install retaining ring (X) on link pin (V).

15. Rotate linkage 90 degrees and position servo lever (P) in housing (Y). Install servo lever shaft (Z).

16. Using screwdriver, install retaining ring (AA).

Go on to Sheet 4



TA236566

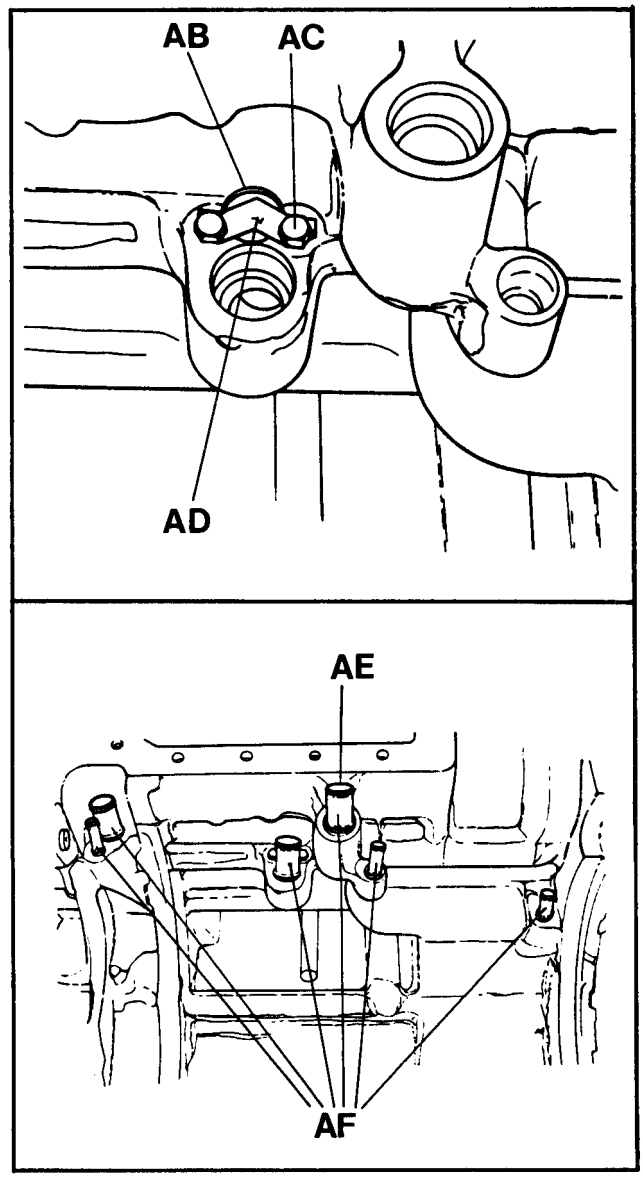
ASSEMBLY (Sheet 4 of 4)

17. Install check valve assembly (AB) and, using 1/2-inch socket, extension, and handle, install two bolts (AC) securing retainer plate (AD) to housing.

18. Torque bolts (AC) to 16 to 21 lb-ft (22 to 28 N.m.)

19. Install seal rings (AE) onto jumper tubes (AF). Install all six jumper tubes (AF) together with their seal rings by pressing them in manually.

END OF TASK



TA236567

Section V. INNER UNIT

3-16 OVERVIEW

Procedures have been provided for complete disassembly, repair, and reassembly of the inner unit. Disassemble only to the extent necessary to accomplish the required repair.

REMOVE TORQUE CONVERTER HOUSING ASSEMBLY (Sheet 1 of 2)

TOOLS: 9/16-in. box wrench
9/16-in. 1/2-in. drive socket
1/2-in. breaker bar
Hoist, 2-ton minimum capacity
Water pump pliers
Plastic insert hammer

SUPPLIES: 3/8-16 x 1-1/2-in. bolt (three required)
3/8-16 jack bolt (two required)
3/8-in. flat washer (three required)
Wood blocks of various sizes

SPECIAL TOOLS: Lifting sling, P/N 7083778

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Remove Inner Unit (Page 2-49)

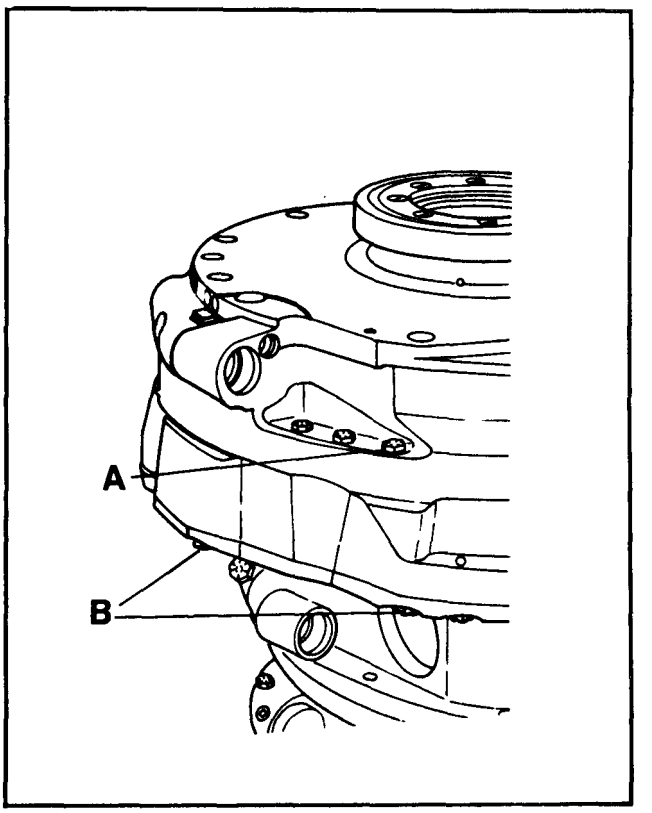
1. Remove the engine sling that was installed on page 2-49.

2. Attach lifting sling with three 3/8-16 x 1-1/2-inch bolts and flat washers to one side of torque converter end of inner unit. Attach sling to hoist, and, letting unit ride on wood block (to avoid damage to bearing), raise inner unit, and lower to work surface in vertical position. Leave sling attached.

3. Using socket and breaker bar, remove 40 bolts (A) and washers by working through access hole in converter housing.

4. Using socket and breaker bar, remove 16 bolts (B).

5. Install two jack bolts in threaded holes in bevel gearing housing. Using box wrench, tighten jack bolts to force converter housing and bevel gearing housing apart.



Go on to Sheet 2.

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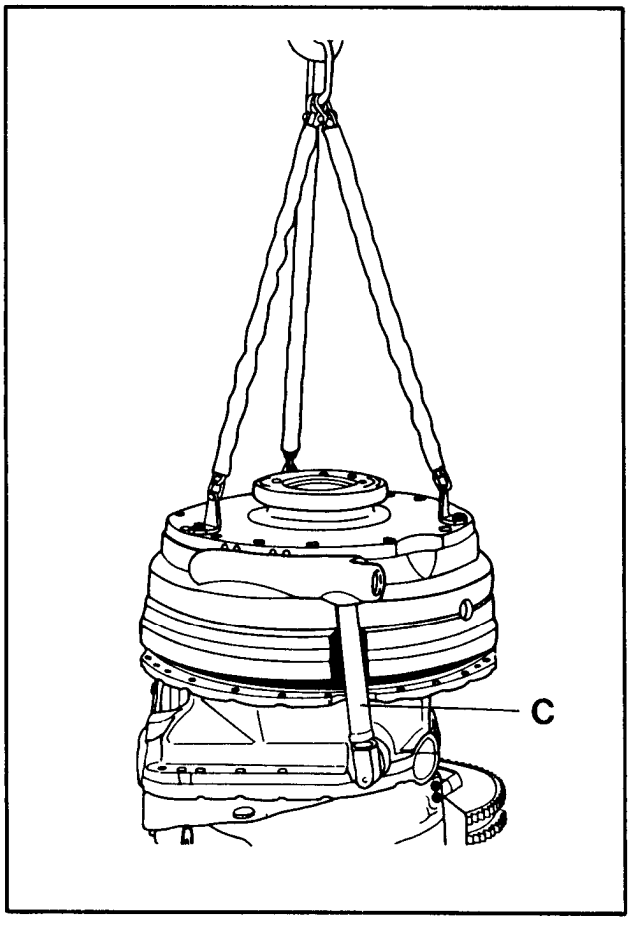
REMOVE TORQUE CONVERTER HOUSING ASSEMBLY (Sheet 2 of 2)

6. Raise hoist to lift converter housing off inner unit. The oil inlet line horizontal tube (C) may remain with either the bevel gear or converter housing. Pull tube (C) from socket using water pump pliers and plastic insert hammer.

7. Invert housing and place on work surface, stator side upward.

8. Remove sling and hoist.

END OF TASK



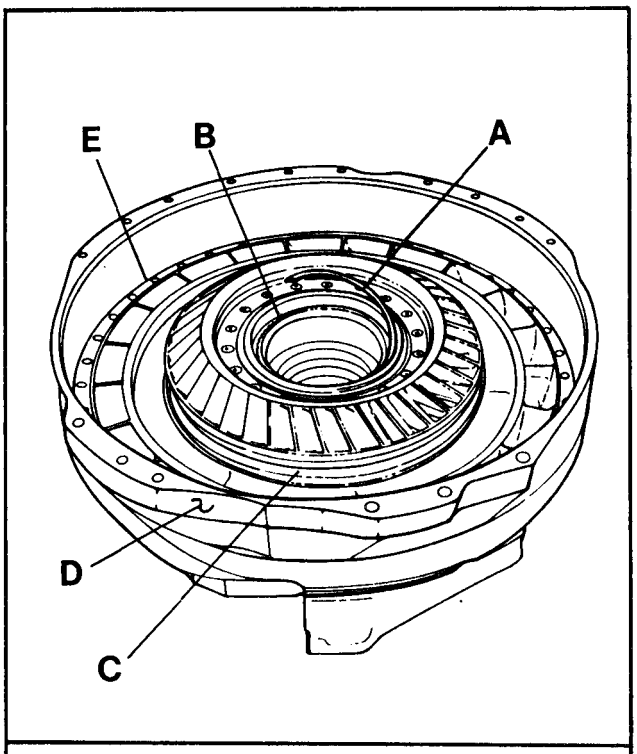
TA236569

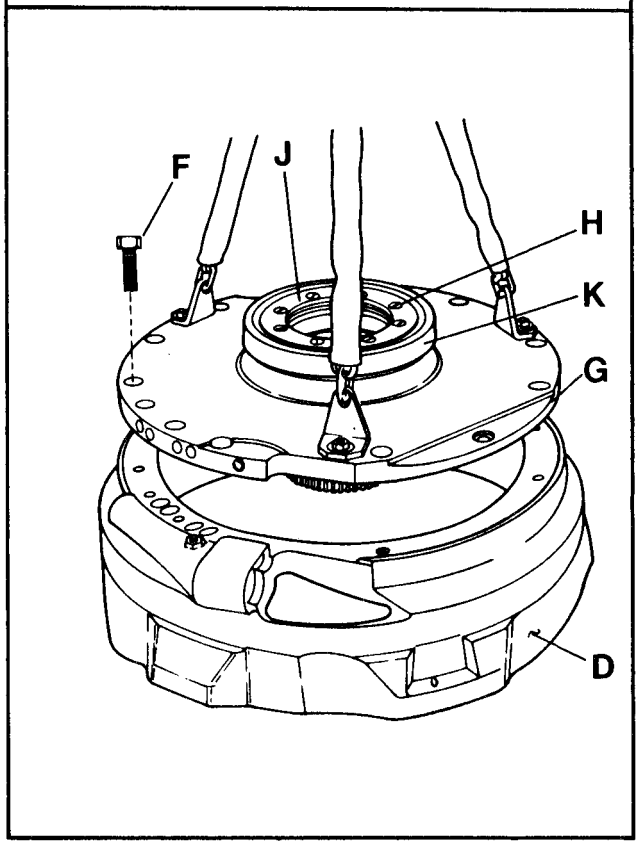
DISASSEMBLE TORQUE CONVERTER HOUSING

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
Machinist's hammer
Punch
Flat-tip screwdriver
Plastic insert hammer
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling, P/N 7083778

PRELIMINARY PROCEDURE: Remove Torque Converter Housing Assembly (Page 3-51)





1. Using screwdriver, remove retaining ring (A) from hub (B).

2. Lift stator assembly (C) out of converter housing (D). Lift converter pump assembly (E) out of housing. Invert pump assembly (E) and remove oil-seal ring together with hook-type seal ring from rear side of pump assembly (E). Remove hook-type seal ring from oil-seal ring.

3. Using sling and hoist, invert housing (D). Using socket and breaker bar, remove 14 bolts (F) from stator plate assembly (G).

4. Raise hoist to lift assembly approximately 1/2 inch off surface. Using plastic insert hammer, gently tap housing (D) until it drops off stator plate assembly (G). Set plate assembly (G) on wood blocks on work surface and remove sling and hoist.

5. Using hammer and punch, destake eight retainer screws (H).

6. Using screwdriver, remove eight retainer screws (H). Remove bearing retainer (J) and outer race of bearing (K).

END OF TASK

TA236570

DISASSEMBLE TORQUE CONVERTER STATOR

TOOLS: Flat-tip screwdriver
5/32-in. socket head screw key
1/4-in. drill bit
Drill motor
Magnetic retriever

PRELIMINARY PROCEDURE: Disassemble Converter Housing (Page 3-53)

1. Using screwdriver, remove spiral retaining ring (A).

2. Using screwdriver in one of three slots provided, pry up roller retainer and remove it. Using magnetic retriever, remove steel ball from stator inner race.

3. Remove first stator (B). Remove 18 springs and rollers from stator (B). Remove spacer and washer.

4. Remove second stator (C). Remove 18 springs and rollers from stator (C).

NOTE

The first and second stators consist of the same kind and number of parts. The following procedure covers disassembly of one stator. Repeat entire procedure for other stator. Disassemble only if parts replacement is necessary.

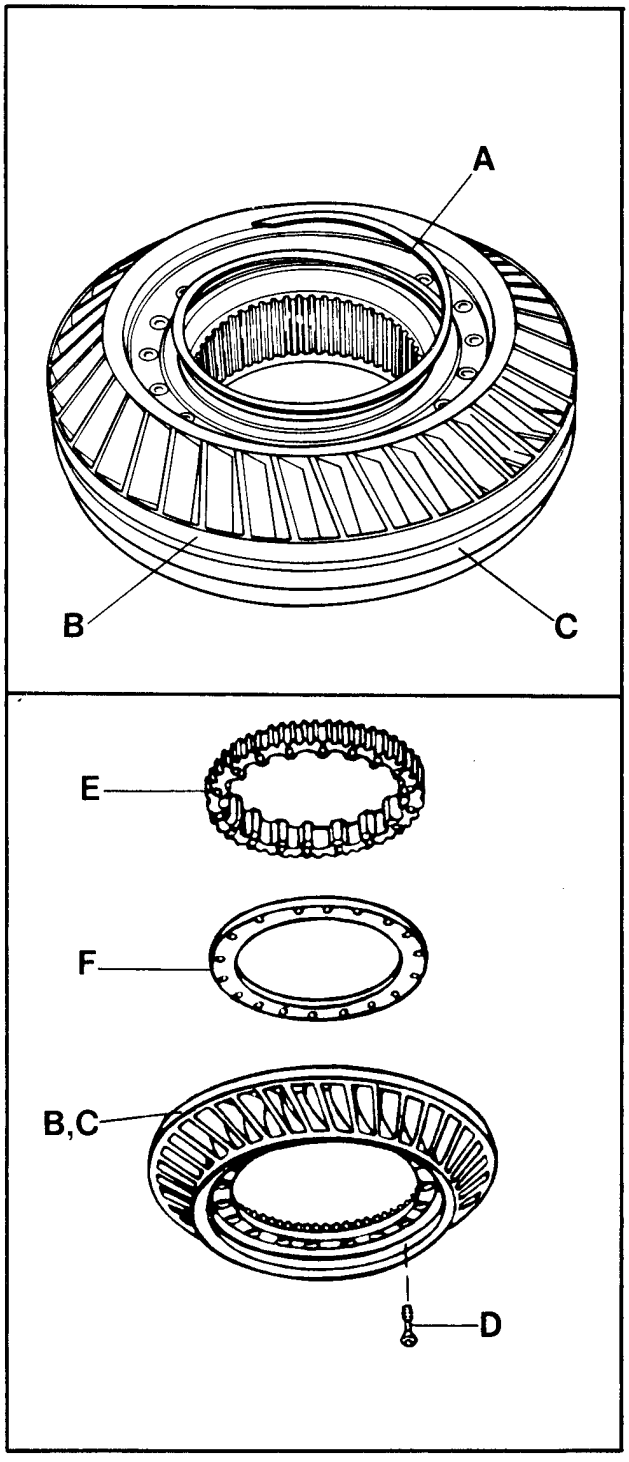
5. Position stator on work surface so that flared ends of 18 screws (D) are upward. Using drill bit and motor, drill flared end off 18 screws (D).

6. Invert stator. Using socket head screw key, remove 18 screws (D).

NOTE

First stator (B) uses a bronze thrust washer bearing (F).
Second stator (C) uses a steel thrust washer bearing (F).

7. Raise stator and remove cam (E) and thrust washer bearing (F).



END OF TASK

TA236571

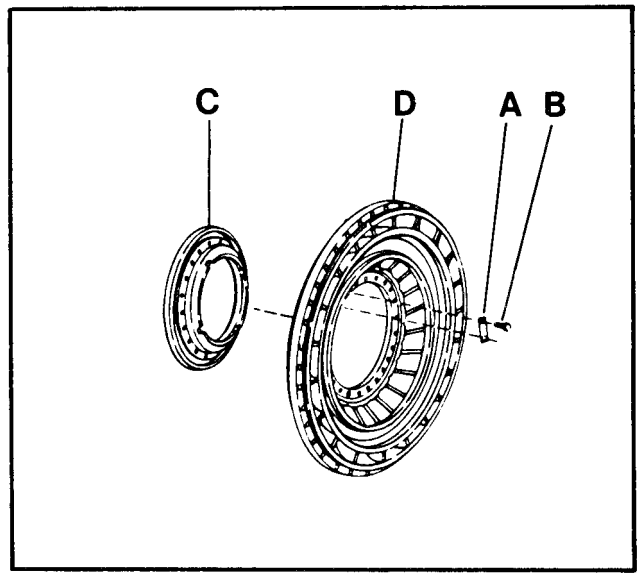
DISASSEMBLE CONVERTER PUMP

TOOLS: 7/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
1/2-in. drive 5-in. extension
Flat-tip screwdriver

PRELIMINARY PROCEDURE: Disassemble Torque Converter Stator (Page 3-54)

1. Using screwdriver, straighten corners of 12 lockplates (A).
2. Using socket, extension, and breaker bar, remove 24 bolts (B). Remove 12 lockplates (A).
3. Remove pump hub (C) from pump (D).

END OF TASK



TA236573

REMOVE CONVERTER TURBINE

TOOLS: 7/16-in. 1/2-in. drive socket
5/8-in. 1/2-in. drive socket
1/2-in. drive breaker bar (two required)
1/2-in. drive 5-in. extension

SPECIAL TOOLS: Spanner wrench, P/N 8390286

SUPPLIES: 1/4-28 x 1-1/2 in. jack bolt (three required)

PRELIMINARY PROCEDURE: Disassemble Converter Pump (Page 3-55)

1. Using spanner wrench (A) and one breaker bar to prevent transmission flange (hub) from rotating, use 5/8-inch socket, extension, and second breaker bar to remove 11 bolts (B).

2. Screw three jack bolts (C) into hub (D). Using 7/16-inch socket, extension, and breaker bar, tighten three jack bolts (C) to force hub (D) and turbine (E), as an assembly, off torque converter cover. Separate hub (D) from turbine (E).

3. Remove three jack bolts (C).

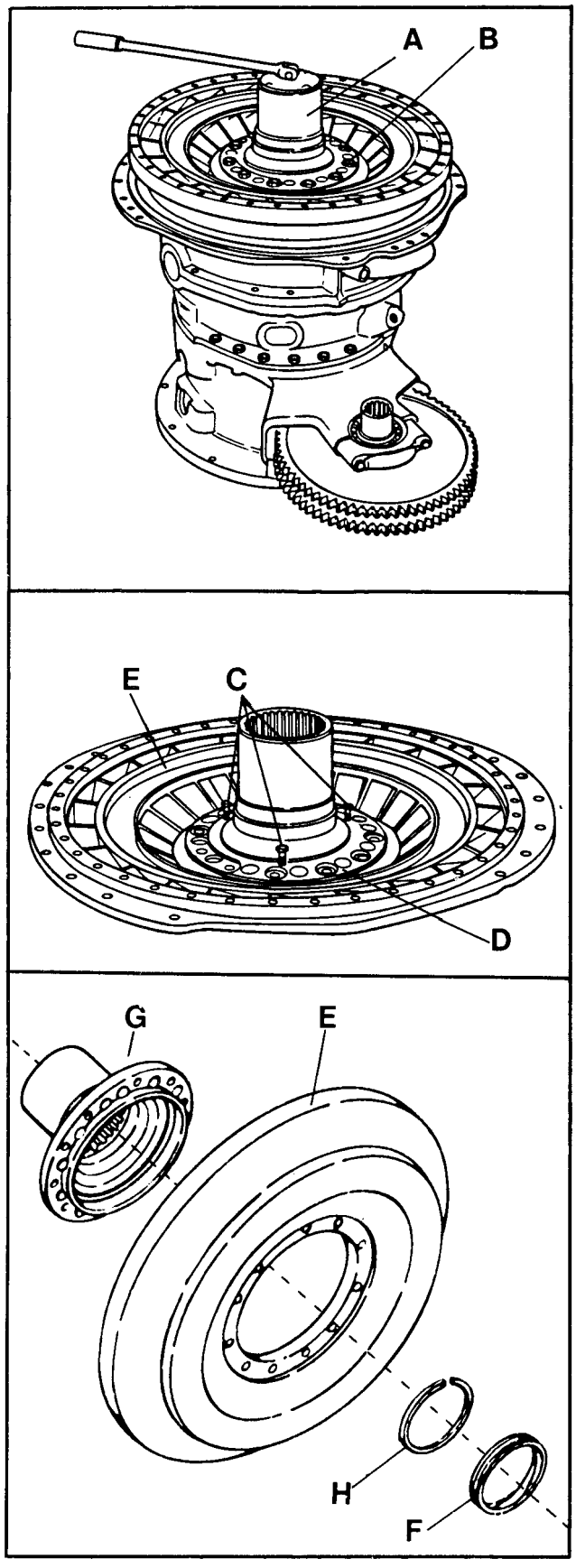
4. Lift turbine (E) out of torque converter cover.

NOTE

Input shaft sleeve may remain on input shaft or may stay with turbine.

5. Remove input shaft sleeve (F) from hub (G). Remove seal ring (H) from sleeve (F).

END OF TASK



TA236574

REMOVE AND DISASSEMBLE TURBINE COVER ASSEMBLY

TOOLS: 1-1/8-in. 1/2-in. drive socket
3/4-in. drive breaker bar
1/2-in. drive breaker bar
1/8-in. socket head screw key
Chisel
Machinist's hammer
Handle extension

SPECIAL TOOLS: Input bevel drive gear wrench, P/N 7081564
Spanner wrench, P/N 8350703

PRELIMINARY PROCEDURE: Remove Converter Turbine (Page 3-56)

1. Bolt assembly securely to work surface. It is suggested that anchor bolts be inserted from beneath work surface and threaded into steer clutch housing flange.

2. Using socket head screw key, remove setscrew (A) from spanner nut (B).

3. Insert input shaft (C) into input drive gear. Insert bevel gear wrench (D) into power take-off splines. Use socket and 1/2-inch breaker bar as shown to prevent bevel gear from turning.

4. Using spanner wrench (E), 3/4-inch breaker bar (F), and handle extension (G), remove spanner nut (B). Lift turbine cover (H) off assembly.

5. Remove bearing retainer (J), bearing (K), Belleville spring (L), and bearing spacer (M).

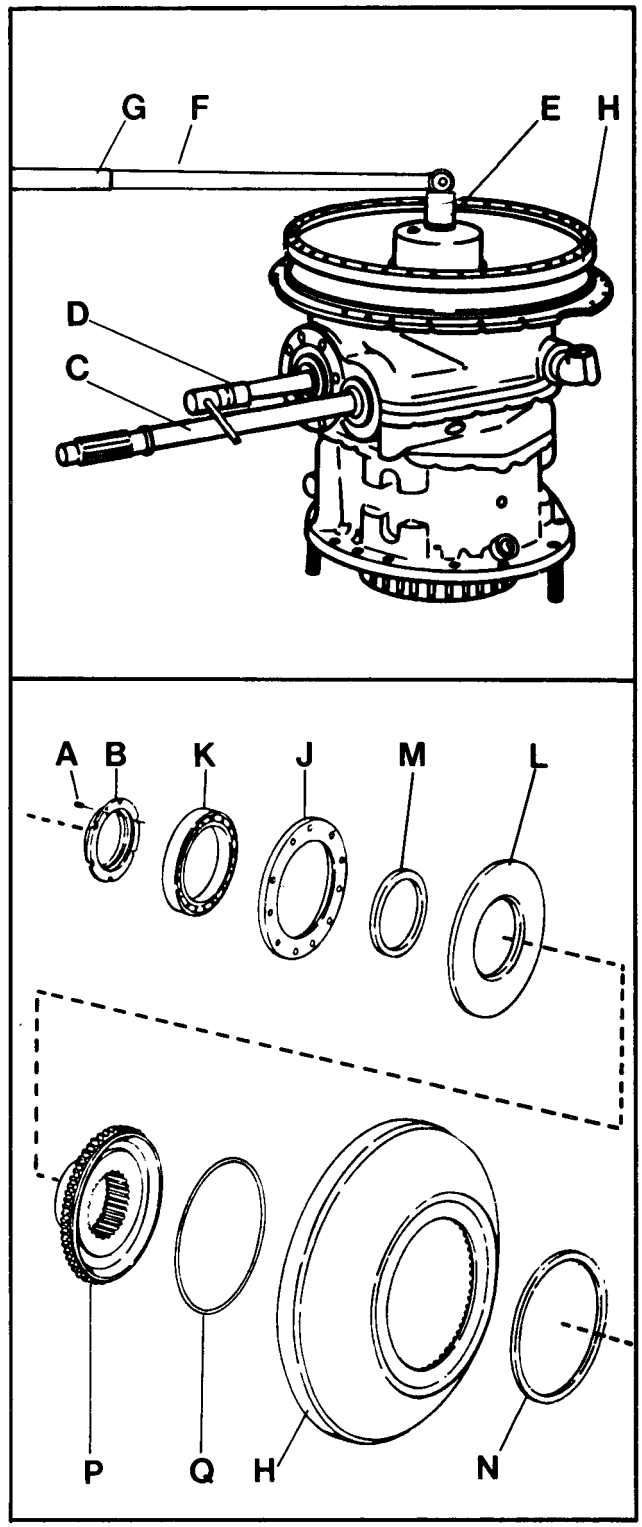
NOTE

Remove hub from cover only if replacement is required.

6. Invert cover. Using chisel and hammer, cut and remove retaining ring (N).

7. Invert cover and remove hub (P) and seal ring (Q).

END OF TASK



TA236575

REMOVE STEER CLUTCH ASSEMBLY

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling,
P/N 7083778

SUPPLIES: Wood blocks of various sizes

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Remove and Disassemble Turbine Cover Assembly (Page 3-57)

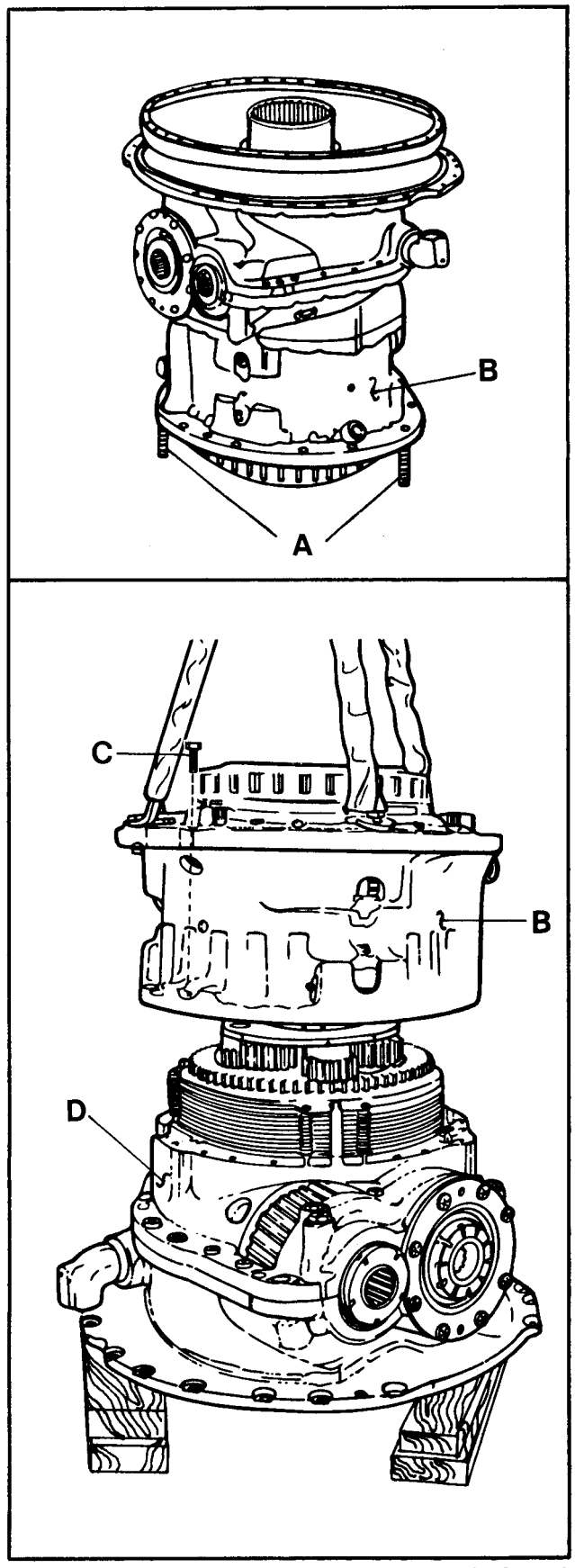
1. If present, remove bolts (A) from steer clutch housing (B) flange.

2. Attach sling and hoist to inner unit. Invert inner unit, letting unit ride on wood block to avoid damage to bearing. Position inner unit on work surface, mounted on wood blocks, with steer clutch housing (B) upward.

3. Using socket and breaker bar, remove 18 bolts (C).

4. Using sling and hoist, raise steer clutch housing (B) off input bevel gear assembly (D) and lower to work surface.

END OF TASK



TA236576

REMOVE AND DISASSEMBLE SPUR GEARS (STEER OUTPUT GEARS)

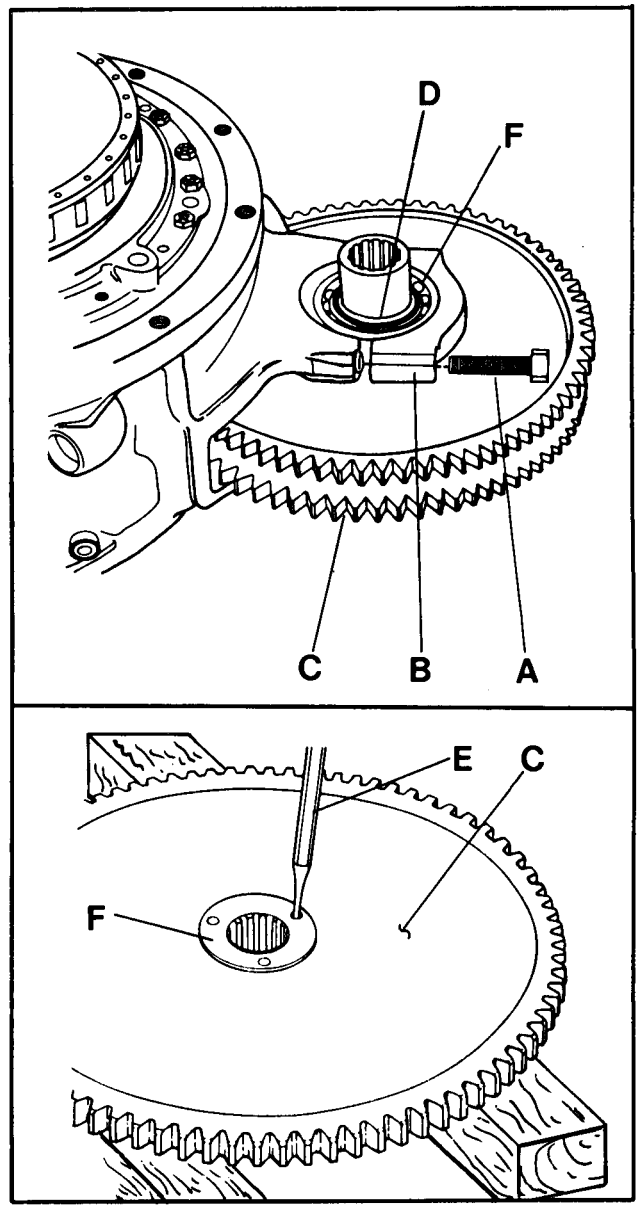
TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
1/2-in. drive 5-in. extension
External retaining ring pliers
Diagonal pliers
Punch
Machinist's hammer
Plastic insert hammer

SUPPLIES: Wood blocks of various sizes

PRELIMINARY PROCEDURE: Remove Steer Clutch Assembly (Page 3-58)

1. Using diagonal pliers, remove lock wire from four bolts (A).
2. Using socket, extension, and breaker bar, remove four bolts (A).
3. Using plastic insert hammer, tap two bearing caps (B) to loosen, then remove.
4. Remove two steer drive gears (C). Separate, and place on work surface bearing side upward.
5. Using external retaining ring pliers, remove one retaining ring (D) from each gear.
6. Invert both gears (C) and place on wood blocks.
7. Using punch (E) and hammer, drive bearing (F) off each gear (C).

END OF TASK



TA236577

REMOVE STEER CLUTCH HOUSING

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling,
P/N 7083778

SUPPLIES: 3/8-16 x 2-in. bolt (two required)
3/8-16 nut (two required)
1/2-20 x 2-in. bolt

PRELIMINARY PROCEDURE: Remove Steer Output Gears (Page 3-59)

1. Using socket and breaker bar, loosen 18 bolts (A). Remove 16 bolts (A) leaving two bolts (A), finger tight, 180 degrees apart.

2. Detach one leg of sling (B). Using hoist and sling, raise steer clutch housing (C) to vertical position. Detach sling (B).

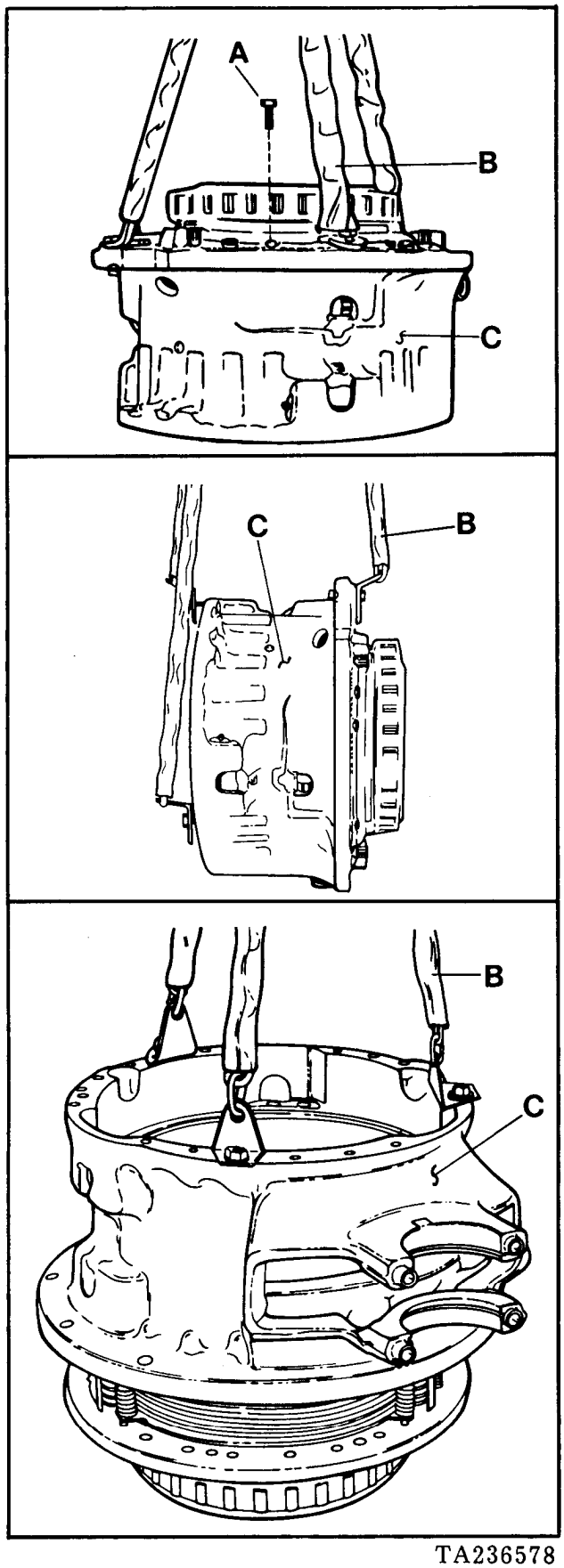
3. Reattach two legs of sling (B) to other side of steer clutch housing (C) using two 3/8-16 x 2-inch bolts and two 3/8-16 nuts.

4. Position steer clutch housing (C), bearing downward, onto clean work surface.

5. Remove remaining two bolts (A).

6. Attach third leg of sling (B) using one 3/8-24 x 1-1/2-inch bolt. Using hoist and sling, lift housing (C) off assembly and set on work surface.

END OF TASK



TA236578

DISASSEMBLE LEFT-STEER CLUTCH

(Sheet 1 of 2)

TOOLS: 1/2-in. 3/8-in. drive socket
3/8-in. drive 6-in. extension
3/8-in. breaker bar
9/16-in. 1/2-in. drive socket
1/2-in. breaker bar
Plastic insert hammer
Machinist's hammer
Chisel
Straight
Flat-tip screwdriver
External retaining ring pliers
Pry bar (three required)

SUPPLIES: Wood blocks of various sizes

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Remove Steer Clutch Housing (Page 3-60)

1. Using retaining ring pliers, remove retaining ring (A).

2. Insert three pry bars (B), 120 degrees apart, between steer differential internal gear (C) and machine keys (D). Using equal force with three pry bars (B), pry up internal gear (C).

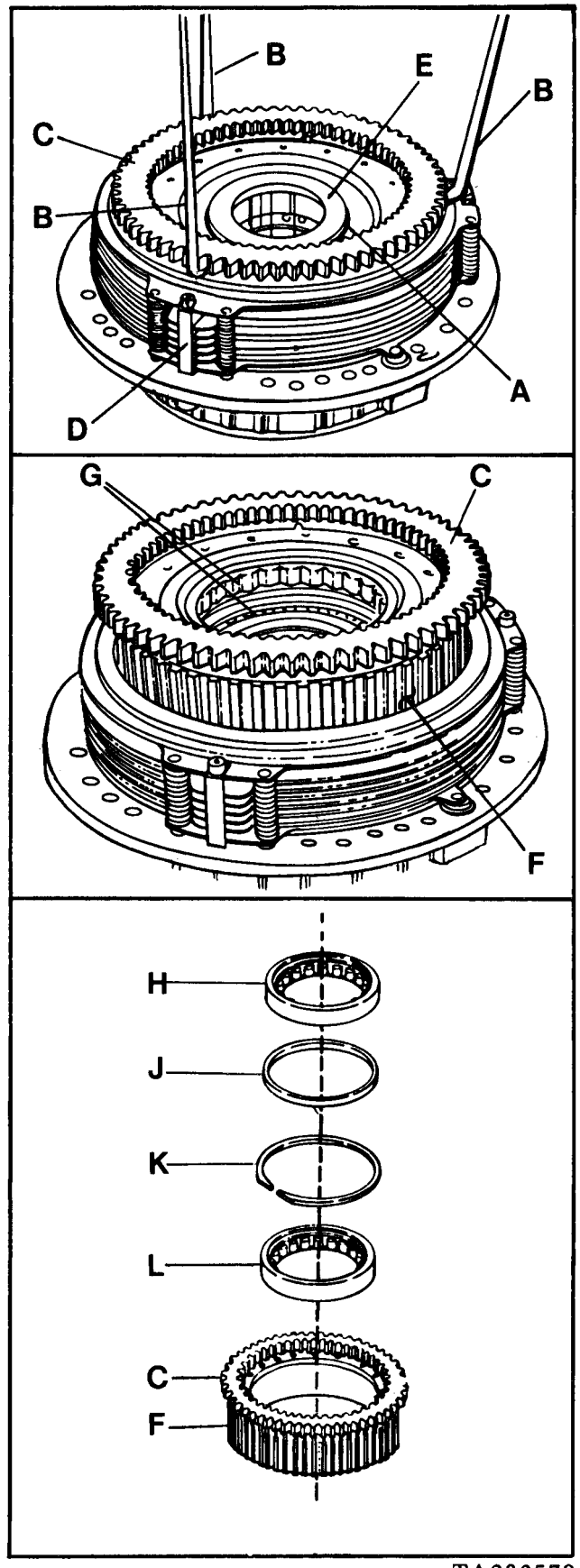
3. Remove hub bearing retainer plate (E). Remove, as an assembly, internal gear (C), hub (F), and bearings (G).

4. Place assembly on work surface with steer differential internal gear (C) downward. Using hammer and straight if necessary, remove outer bearing (H) and spacer (J).

5. Invert the assembly and, using screwdriver, remove retaining ring (K).

6. Using hammer and straight if necessary, remove inner bearing (L).

Go on to Sheet 2.



TA236579

DISASSEMBLE LEFT-STEER CLUTCH (Sheet 2 of 2)

NOTE

It is not necessary to separate the drive hub (F) and differential internal gear (C) unless one or both require replacement.

7. Using hammer and chisel, destake 16 bolts (M) securing hub (F) to gear (C). Using 1/2-inch, 3/8-inch drive socket, extension, and 3/8-inch drive breaker bar, remove 16 bolts (M). Separate hub (F) from internal gear (C).

8. Remove back plate (N), reaction plate (P), six release springs (Q), 11 clutch disks (R), and piston reaction plate (S) with lubricating valve (T) attached. Remove lubricating valve (T) from plate (S).

NOTE

It may be necessary to use screwdrivers to pry piston out of housing cover bore.

9. Remove steer clutch piston (U).

10. Using 9/16-inch 1/2-inch drive socket, 1/2-inch drive extension, and 1/2-inch drive breaker bar, remove 12 bolts (V). Remove baffle (W).

11. Remove seal rings (X) from piston and housing.

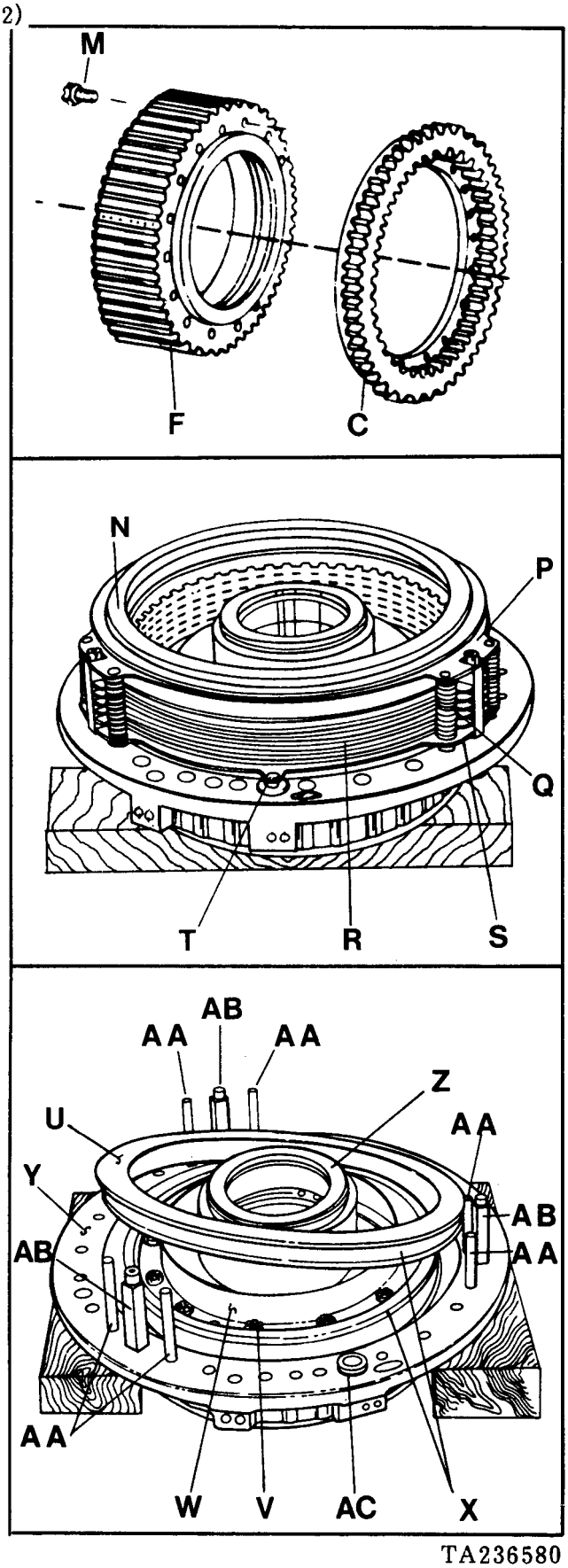
12. Place steer clutch housing cover (Y) on blocks.

13. Using plastic insert hammer, remove left-steer clutch hub (Z).

NOTE

Do not remove pins (AA), keys (AB), or lubrication valve sleeve (AC) from cover (Y) unless they require replacement.

END OF TASK



TA236580

DISASSEMBLE LEFT-STEER CLUTCH HUB

TOOLS: Machinist's hammer
Punch
External retaining ring pliers

SUPPLIES: Wood block

PRELIMINARY PROCEDURE: Disassemble Left-Steer Clutch (Page 3-61)

1. Invert hub (A) and using retaining ring pliers, remove retaining ring (B).

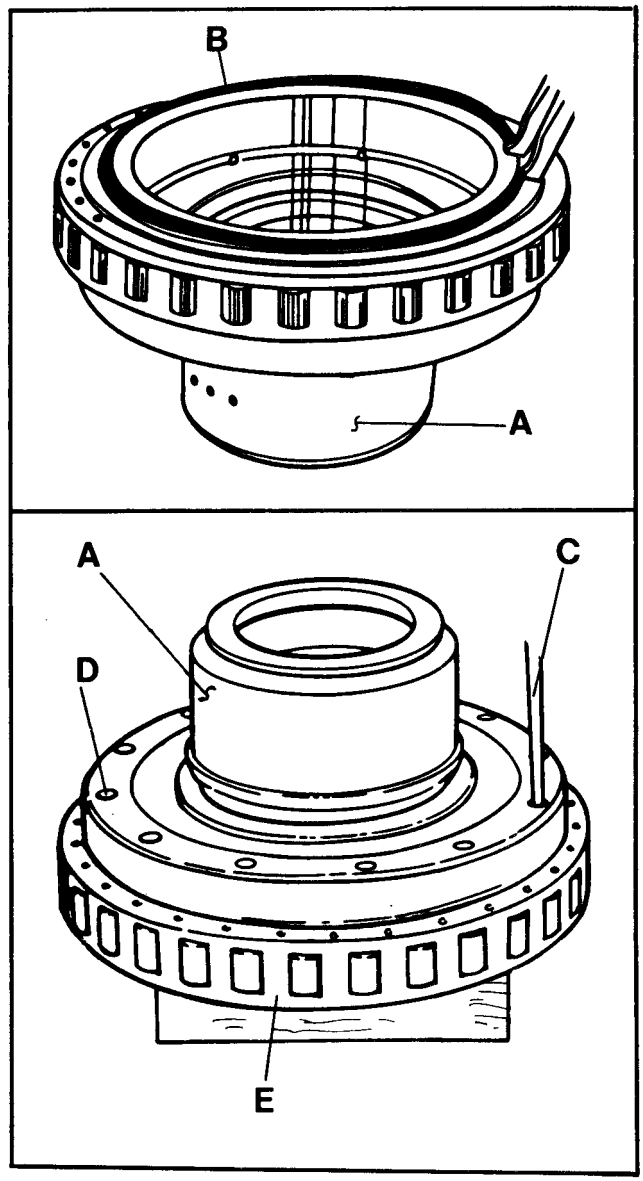
2. Again invert hub (A) and support center on wood block.

3. Using punch (C) through baffle bolt holes (D) and hammer, drive the inner race and rollers of the reverse-range carrier bearing (E) from hub (A).

NOTE

Bearing inner race and rollers is a mated set with bearing outer race in reverse-range carrier. Serial numbers of inner and outer races must be matched for reassembly. If one part is replaced, other must also be replaced.

END OF TASK



TA236581

DISASSEMBLE RIGHT-STEER CLUTCH (Sheet 1 of 2

TOOLS: 9/16-in. 3/8-in. drive socket
3/8-in. drive 6-in. long extension
1/2-in. drive 5-in. long extension
9/16-in. 1/2-in. drive socket
3/8-in. drive breaker bar
Chisel
Flat-tip screwdriver
External retaining ring pliers
Machinist's hammer
Straight
Pry bar (three required)

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Remove Steer Clutch Housing (Page 3-60)

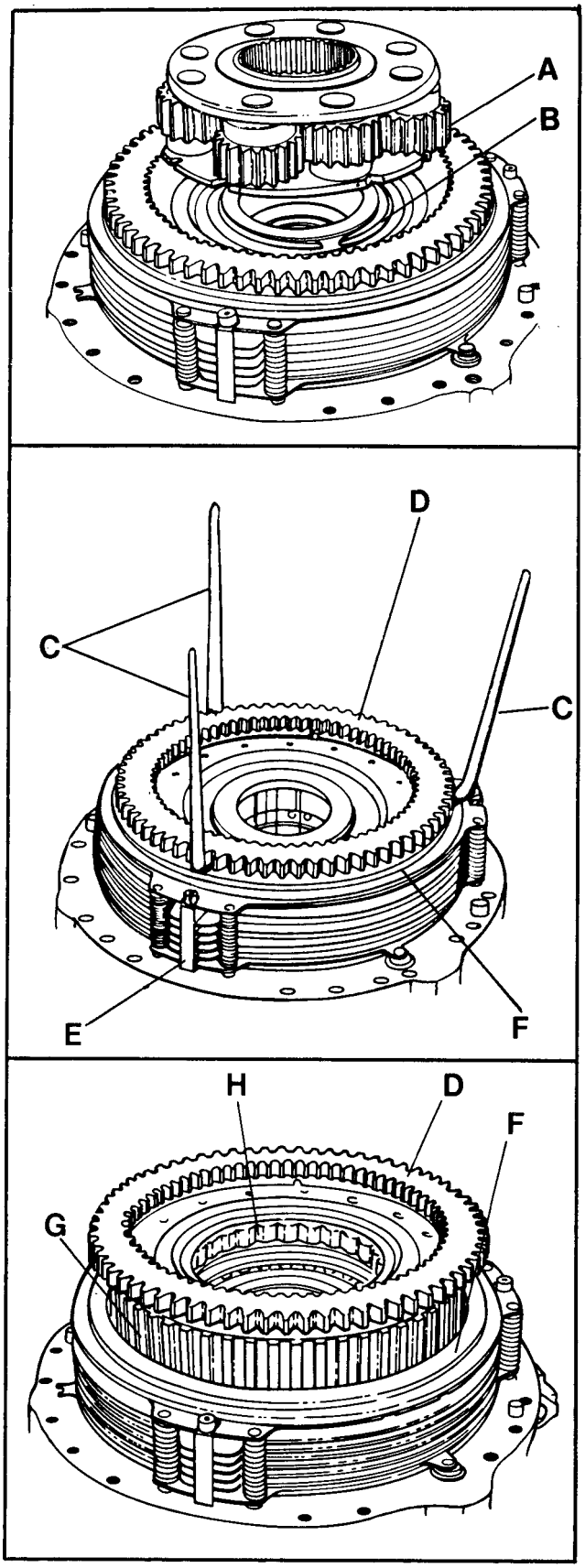
1. Remove steer differential assembly (A).

2. Using retaining ring pliers, remove retaining ring (B).

3. Insert three pry bars (C), 120 degrees apart, between steer differential internal gear (D) and machine keys (E). Using equal force with three pry bars (C), pry up internal gear (D).

4. Remove hub bearing retainer plate (F). Remove, as an assembly, internal gear (D), hub (G), and bearings (H).

Go on to Sheet 2.



TA236572

DISASSEMBLE RIGHT-STEER CLUTCH (Sheet 2 of 2

5. Place assembly on work surface with steer differential internal gear (D) downward. Using hammer and straight, if necessary, remove outer bearing (J) and spacer (K).

NOTE

It is not necessary to separate drive hub (G) and differential internal gear (D) unless one or both require replacement.

6. Using screwdriver, remove retaining ring (L).

7. Using hammer and straight, if necessary, remove inner bearing (M).

8. Using hammer and chisel, destake 16 bolts (N) securing hub (G) to gear (D). Using 1/2-inch, 3/8-inch drive socket, extension, and breaker bar, remove 16 bolts (N) to separate hub (G) from internal gear (D).

9. Remove back plate (P), reaction plate (Q), six release springs (R), 11 clutch plates (S), and piston reaction plate (T) with lubricating valve (U) attached. Remove valve (U) from plate (T).

NOTE

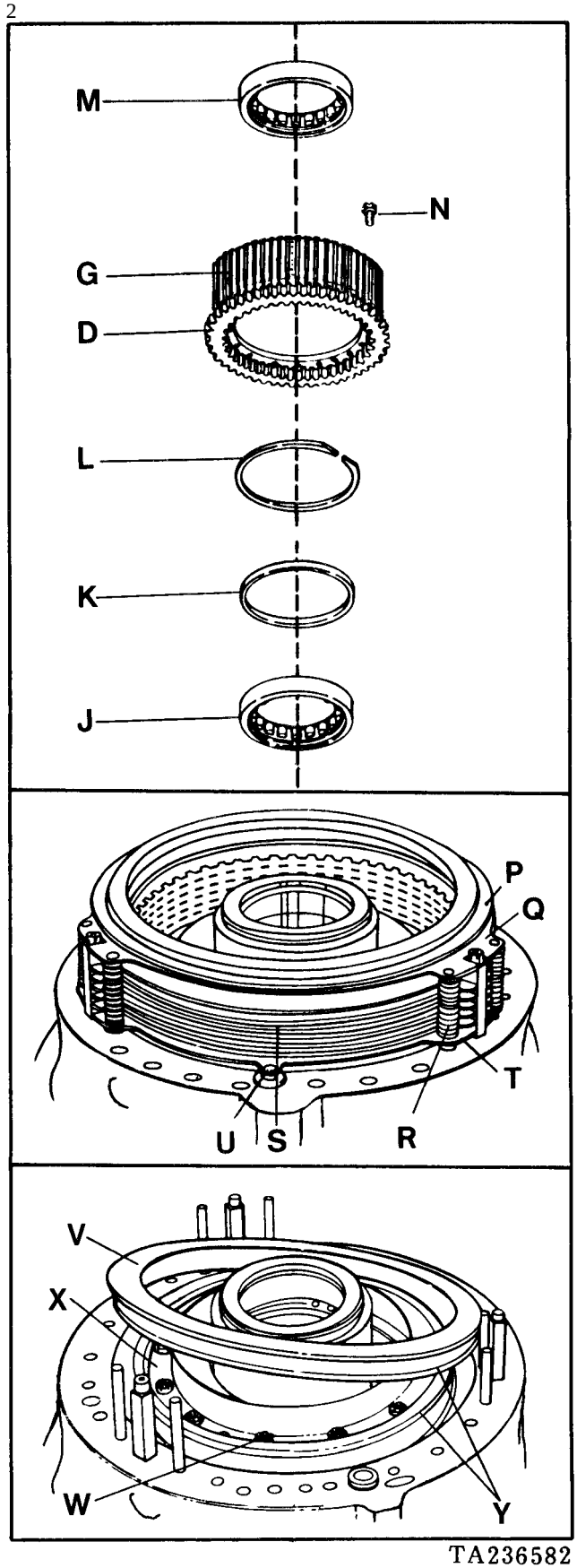
It may be necessary to use screwdrivers to pry piston out of bevel gear housing cover.

10. Remove steer clutch piston (V).

11. Using 9/16-inch 1/2-inch drive socket, 1/2-inch drive extension, and 1/2-inch drive breaker bar, remove 12 bolts (W). Remove baffle (X).

12. Remove seal rings (Y) from piston and housing.

END OF TASK



TA236582

DISASSEMBLE STEER DIFFERENTIAL

TOOLS: Flat-tip screwdriver
Punch
Machinist's hammer

SUPPLIES: Wood blocks of various sizes

PRELIMINARY PROCEDURE: Disassemble Right-Steer Clutch (Page 3-64)

1. Use screwdriver to rotate four lock pins (A) so that bend in pins is upward. Using hammer and punch, straighten pins (A) and drive pins (A) from their holes.

2. Place unit on wood blocks.

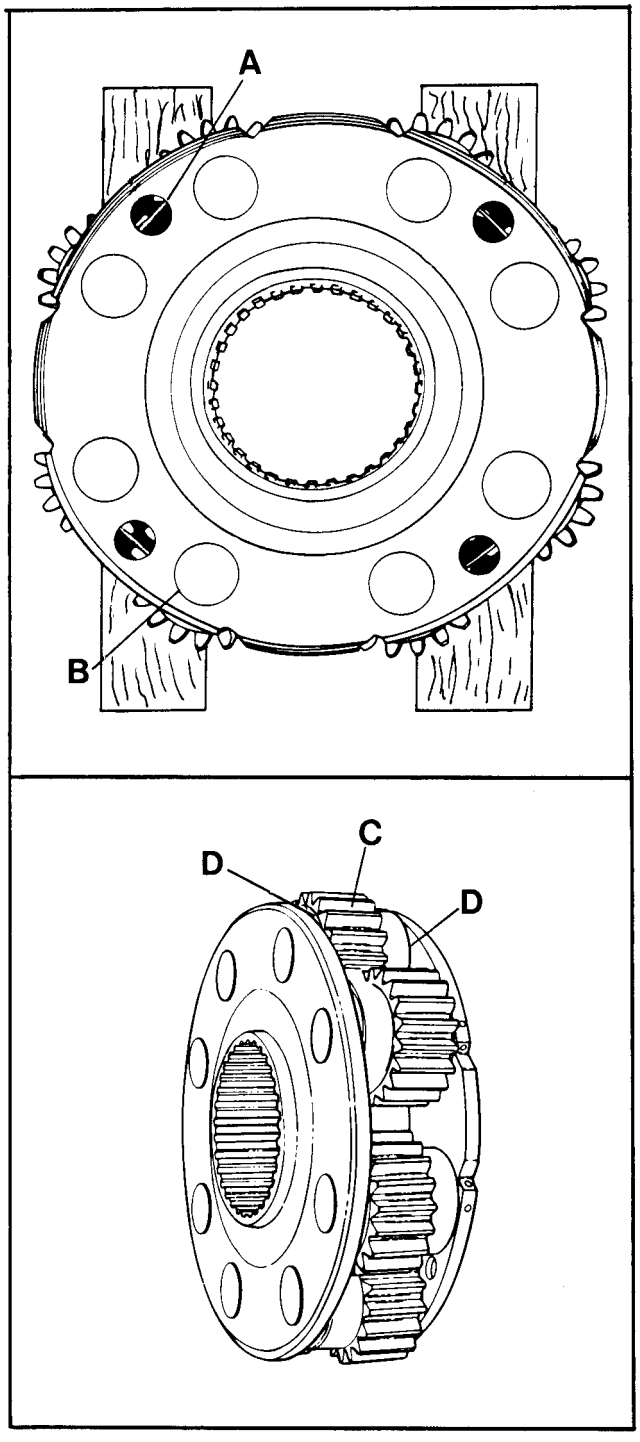
3. Using hammer and punch, drive eight spindles (B) from carrier.

4. Remove eight spur gears (pinions) (C) and 16 thrust washers bearings (D).

NOTE

Pinions are a matched set. Do not mix with other pinions. If one pinion must be replaced, replace all eight.

END OF TASK



TA236585

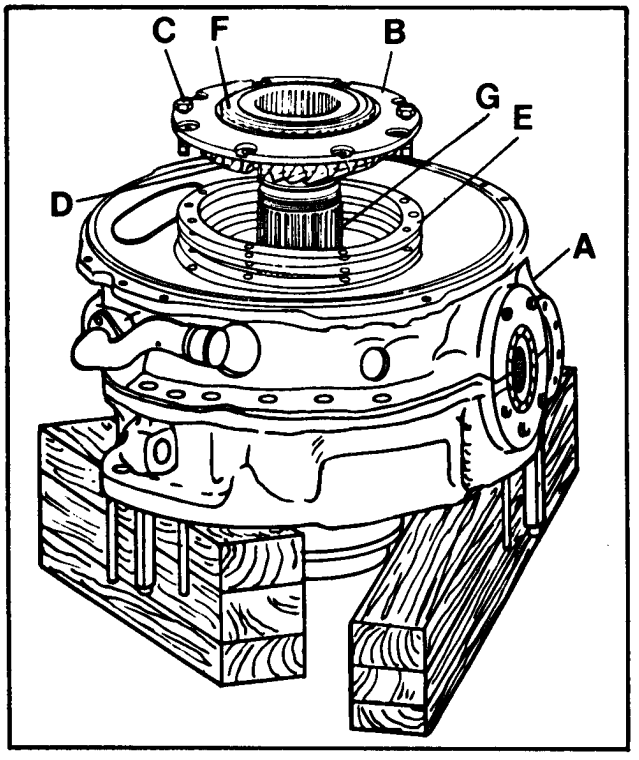
REMOVE AND DISASSEMBLE HELICAL GEAR (INPUT DRIVEN BEVEL GEAR)

TOOLS: 3/4-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive ratchet handle
Hoist, 2-ton minimum capacity
Arbor press
1/2-in. drive breaker bar

SPECIAL TOOLS: Lifting sling, P/N 7083778
Machine bolt, P/N 7737292 (two required)

SUPPLIES: Wood blocks of various sizes

PRELIMINARY PROCEDURE: Disassemble Steer Differential (Page 3-66)



1. Using sling and hoist, position input gearing assembly on work surface with input driven bevel gear carrier (A) upward. Use wood blocks under housing to clear right-steer clutch hub.

2. Using socket, extension, and breaker bar, remove eight bolts from bearing retainer (B).

3. Thread two machine bolts (C) into threaded holes in bearing retainer (B). Using socket, extension and ratchet handle, tighten machine bolts (C) to force input driven bevel gear assembly off converter input shaft.

4. Remove input driven bevel gear assembly (D) and shims (E). Remove two machine bolts (C).

5. Using arbor press, press bearing outer race (F) out of bearing retainer (B), then press bearing inner race off input driven bevel gear hub (G).

END OF TASK

TA236583

REMOVE TRANSMISSION NECK ASSEMBLY, TUBE, RIGHT-STEER CLUTCH HUB, AND CONVERTER INPUT SHAFT

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive ratchet handle
Flat-tip screwdriver
Hoist, 2-ton minimum capacity
1/2-in. drive breaker bar

SPECIAL TOOLS: Lifting sling, P/N 7083778

SUPPLIES: Wood blocks of various sizes
3/8-24 x 1-1/2-in. jack bolt (three required)

PRELIMINARY PROCEDURE: Disassemble Helical Gear (Page 3-67)

1. Using hoist and sling, position input gearing assembly on work surface with right-steer clutch hub (A) upward. Use wood blocks under housing to clear converter input shaft.

2. Using socket, extension, and breaker bar, remove bolt (B).

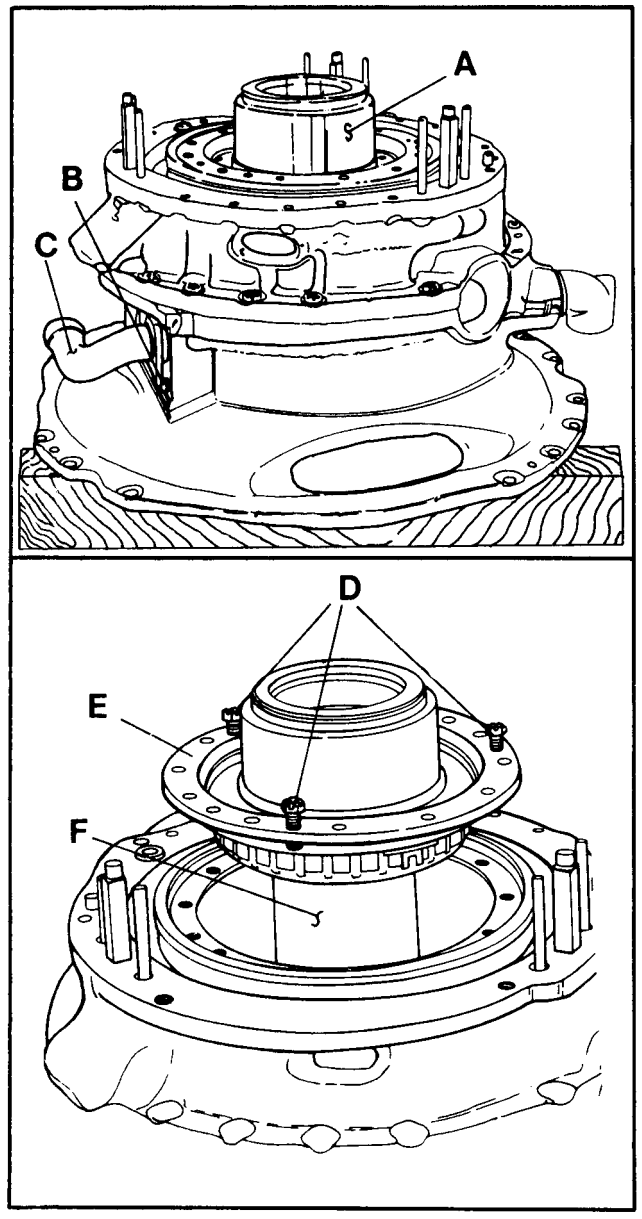
3. Using screwdriver under flange of oil inlet neck and tube assembly (C) pry loose and remove assembly.

4. Thread three jack bolts (D) into threaded holes in right-steer clutch hub (E).

5. Using socket, extension, and ratchet handle, tighten three jack bolts (D) to force hub out of housing.

6. Remove right-steer clutch hub and converter input shaft (F) as an assembly. Remove three jack bolts (D).

END OF TASK



TA236584

DISASSEMBLE RIGHT-STEER CLUTCH HUB AND CONVERTER INPUT SHAFT

TOOLS 7/16-in. box wrench
Machinist's hammer
Punch
Plastic insert hammer
Arbor Press

SUPPLIES: Wood blocks of various sizes

PRELIMINARY PROCEDURE: Remove Neck and Tube Assembly, Clutch Hub, and Shaft (Page 3-68)

1. Position assembly on working surface resting on right-steer clutch hub (A), supported on wood blocks.

2. Using machinist's hammer and punch, destake lockplate (B). Using wrench, remove two bolts (C). Remove bearing retainer nut lockplate (B).

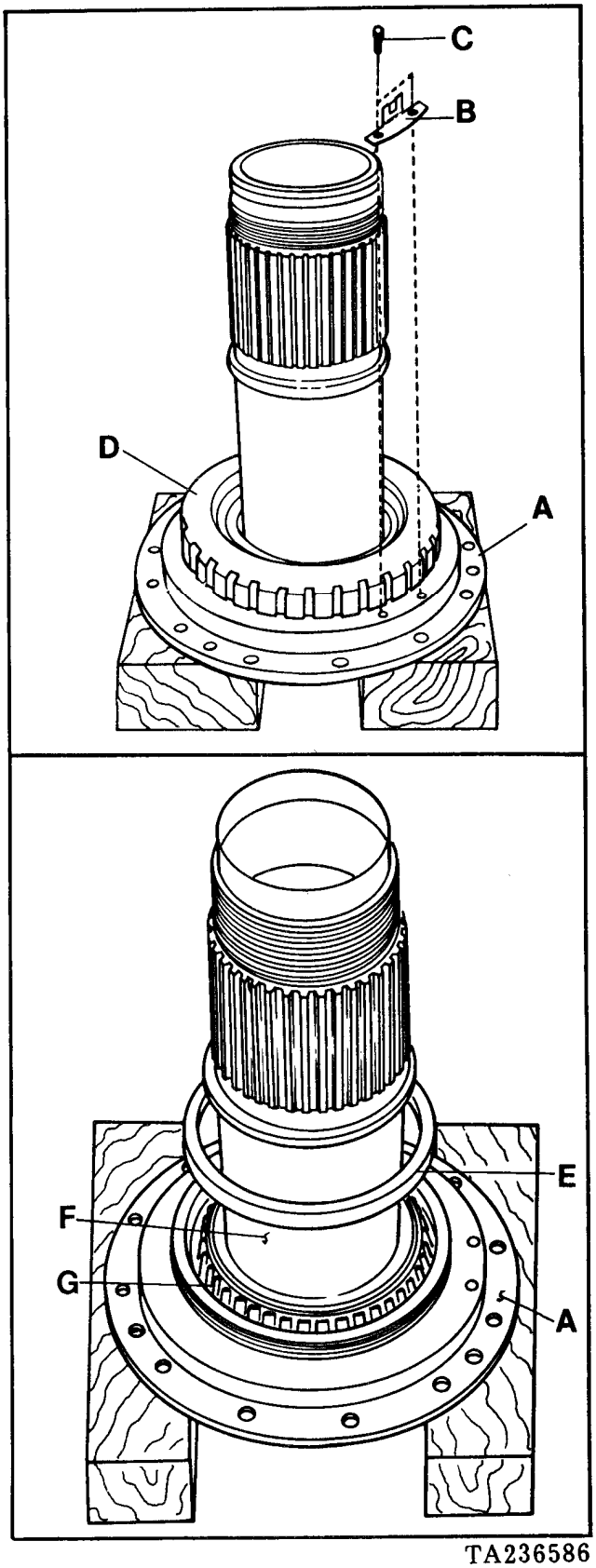
3. Remove bearing retainer nut (D). Use hammer and punch, if necessary, to loosen retainer nut (D) on threads.

4. Drive right-steer clutch hub (A) with plastic insert hammer until bearing outer race (E) breaks free and hub (A) drops to work surface. Remove outer race (E).

5. Remove right-steer clutch hub (A) from converter input shaft (F).

6. If replacement is required, use arbor press to press inner race and rollers (G) from converter input shaft (F).

END OF TASK



TA236586

REMOVE INPUT DRIVE BEVEL GEAR CARRIER (Sheet 1 of 2)

TOOLS: 11/16-in. open end wrench
9/16-in. combination wrench
9/16-in. 1/2-in. drive socket
5/8-in. 1/2-in. drive socket
1/2-in. drive 5-in. long extension
1/2-in. drive breaker bar
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling, P/N 7083778

SUPPLIES: Wood blocks of various sizes
3/8-24 x 2-in. jack bolt (three required)

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Disassemble Clutch Hub and Shaft (Page 3-69)

1. Using 9/16-inch socket and breaker bar, remove eight bolts from holes (A).

CAUTION

Do not draw bearing retainer out more than necessary to remove shims. To draw retainer further may damage ball bearing.

2. Thread two jack bolts (B) into threaded holes in bearing retainer (C). Using 9/16-inch socket and ratchet handle, tighten jack bolts only sufficiently so that shims (D) can be removed.

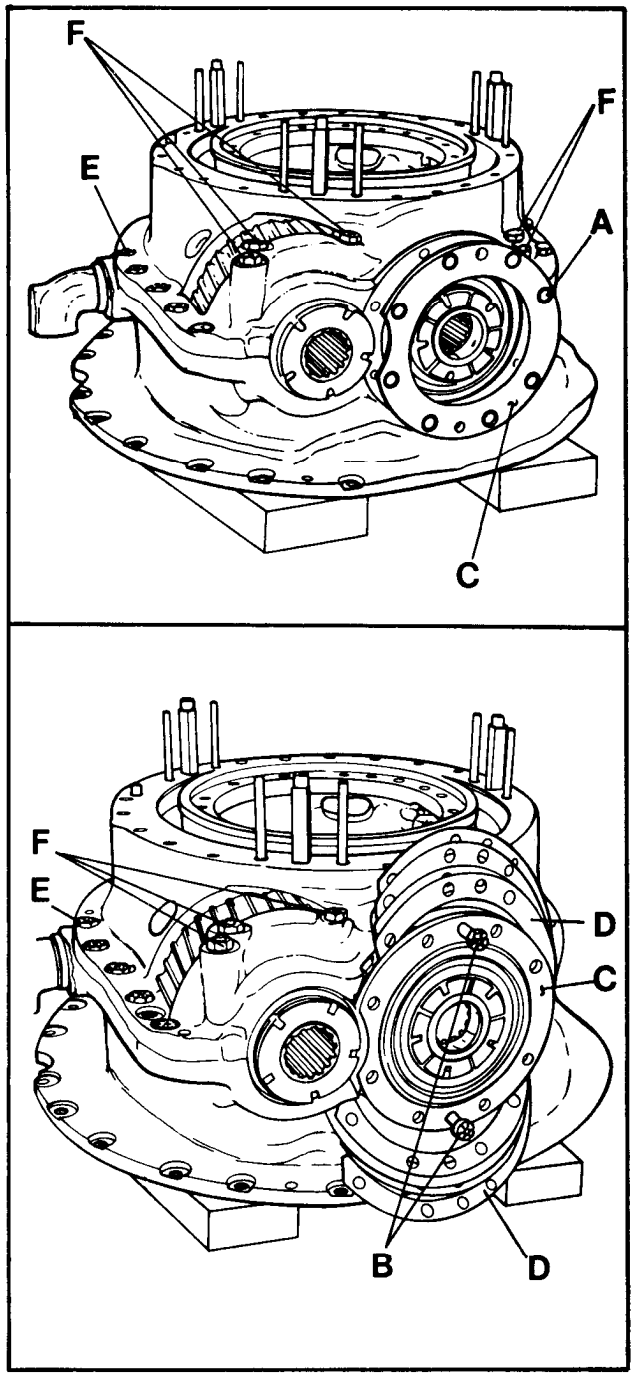
NOTE

Keep upper and lower shim packs separate. Tag shim packs to retain location for assembly.

3. Remove jack bolts (B), bearing retainer (C), and shims (D).

4. Using 9/16-inch socket, extension, and breaker bar and combination wrench, remove 15 bolts (E).

5. Using 5/8-inch socket and breaker bar, remove five bolts (F).



Go on to Sheet 2.

TA236587

REMOVE INPUT DRIVE BEVEL GEAR CARRIER (Sheet 2 of 2)

6. Using hoist and sling, remove input drive bevel gear carrier (G) from input driven bevel gear carrier (H). Use three jack bolts (J) in threaded holes in drive bevel gear carrier (G), if necessary, to separate carriers. Remove jack bolts (J).

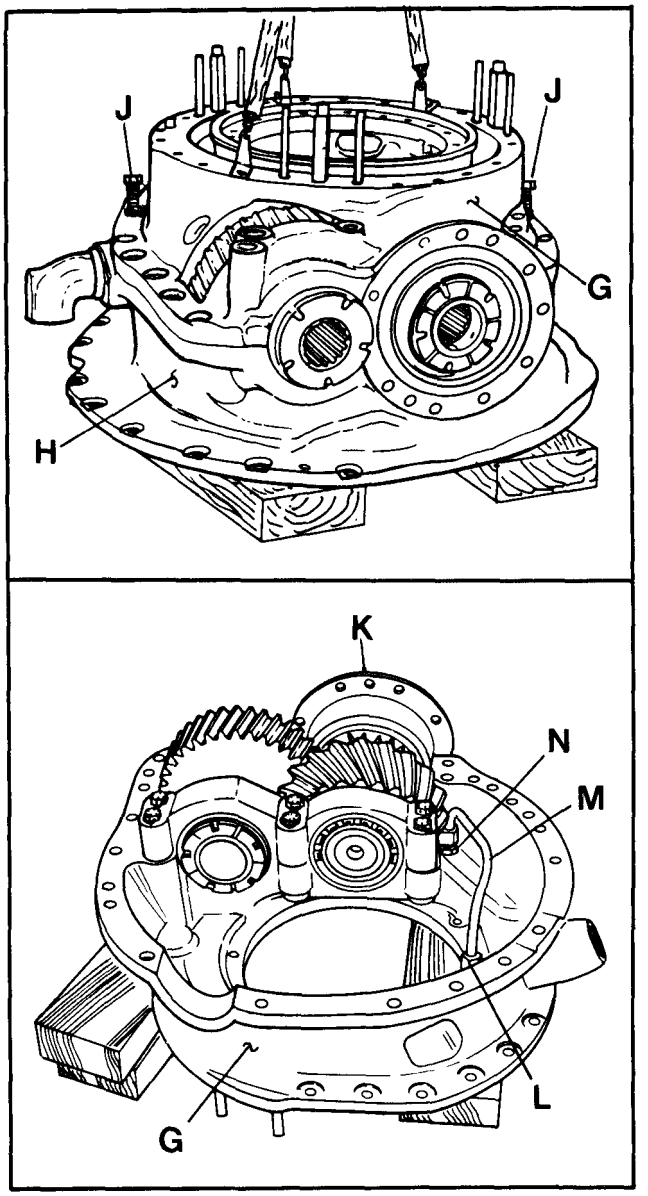
CAUTION

Be careful to keep bearing cage (K) from falling out when turning carrier (G).

7. Invert input drive bevel gear carrier (G) and place it on work surface. Use wood blocks to prevent damage to dowels and keys.

8. Using open end wrench, remove two connector nuts (L) and remove oil transfer tube (M) from input driven bevel gear carrier (G). Using same wrench remove two connector bodies (N).

END OF TASK



TA236588

DISASSEMBLE INPUT DRIVE BEVEL GEAR CARRIER

TOOLS: 5/8-in. 1/2-in. drive socket
1/2-in. drive breaker bar
Diagonal pliers

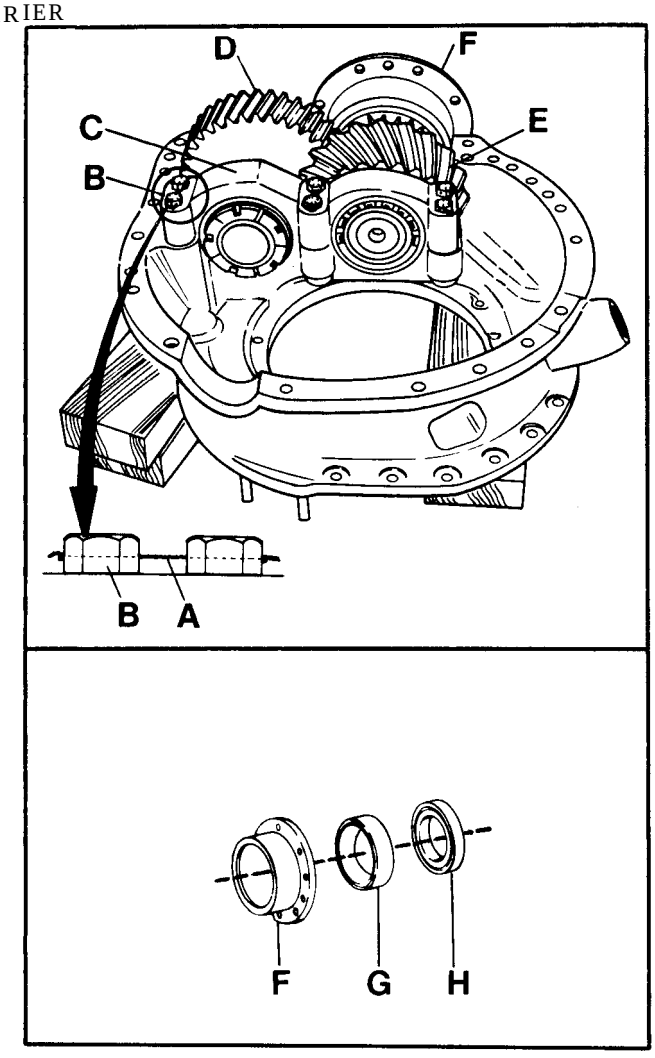
PRELIMINARY PROCEDURE: Remove Input Drive Bevel Gear Carrier (Page 3-70)

1. Using diagonal pliers, remove lock wire (A) from six bolts (B) on bearing cap (C).
2. Using socket and breaker bar, remove six bolts (B).
3. Remove bearing cap (C).
4. Lift helical gear (transfer drive gear) assembly (D) out of carrier.
5. Lift helical gear (transfer driven gear) assembly (E) out of carrier.
6. Remove bearing cage (F) from transfer driven gear assembly (E). Remove bearing race (G) and bearing assembly (H) from cage (F) only if replacement is necessary.
7. Using arbor press, press roller bearing outer race (G) and ball bearing (H) out of bearing cage (F).

NOTE

Transfer drive gear assembly and transfer driven gear assembly should not be disassembled further unless bearings or gears require replacement.

END OF TASK



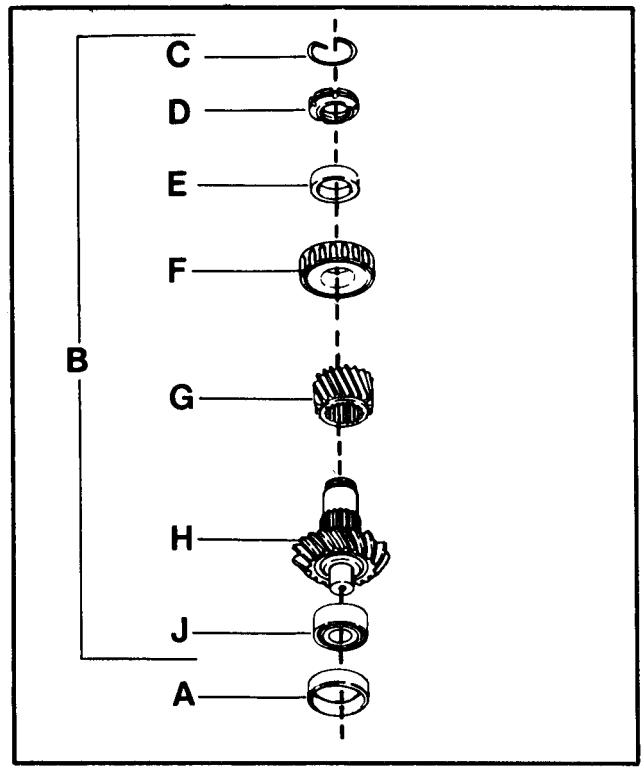
TA236589

DISASSEMBLE HELICAL GEAR (TRANSFER DRIVEN GEAR) ASSEMBLY

TOOLS: 3/4-in. drive breaker bar
Vise with caps
Flat-tip screwdriver
Machinist's hammer
Chisel
Arbor press

SPECIAL TOOLS: Face wrench socket, P/N 8350702

PRELIMINARY PROCEDURE: Disassemble Bevel Gear Carrier (Page 3-72)



1. Remove sleeve bearing (A) from input drive bevel gear assembly (B).

2. Clamp input drive bevel gear assembly (B) in a vise with caps.

3. Using hammer, chisel and screwdriver, remove retaining ring (C) from gear assembly (B).

NOTE

If round, plain nut (spanner nut) (D) is left-hand threaded, it will be marked LH.

4. Using face wrench socket and breaker bar, remove spanner nut (D) from end of assembly (B). Remove spacer (E) and bearing inner race and rollers (F). Remove transfer driven gear (G) from gear (H).

5. Remove assembly from vise and using arbor press, press roller bearing (J) from shaft.

END OF TASK

TA236590

DISASSEMBLE HELICAL GEAR (TRANSFER DRIVE GEAR) ASSEMBLY

TOOLS: 3/4-in. drive breaker bar
Vise with caps
Flat-tip screwdriver
Machinist's hammer
External retaining ring pliers
Chisel

SPECIAL TOOLS: Face wrench socket, P/N 8350702
Assembly remover, P/N 8356051

PRELIMINARY PROCEDURE: Disassemble Bevel Gear Carrier (Page 3-72)

1. Using external retaining ring pliers, remove snapring from bearing (A). Remove sleeve bearings (B).

2. Clamp transfer drive (A) gear assembly (C) in a vise with caps.

3. Using hammer, chisel, and screwdriver, destake and remove one retaining ring (D).

NOTE

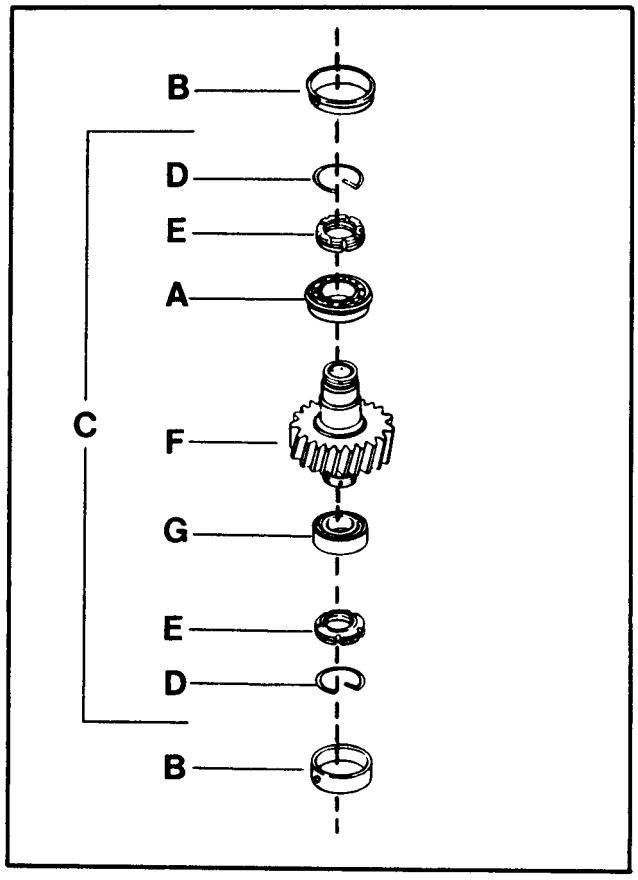
If round, plain nuts (spanner nuts) (E) have left-hand threads, they will be marked LH.

4. Using face wrench socket and breaker bar, remove one spanner nut (E).

5. Invert assembly and repeat steps 3 and 4 to remove retaining ring (D) and spanner nut (E) from opposite end of gear (F).

6. Remove assembly from vise and using assembly remover, press bearings (A) and (G) from gear (F).

END OF TASK



TA236591

3-17 CLEANING

Clean all end cover assembly parts, as necessary, in accordance with page 2-17.

3-18 INSPECTION AND REPAIR

a. Refer to page 2-19 for general inspection and repair recommendations.

b. Additional repair procedures which may occasionally be necessary are provided below.

1. Inspect carrier pins and dowels. If damaged, loose, or missing, replace carrier housing.

2. Inspect bevel gear carrier pipe plug. If loose or missing, replace using 1/4-inch drive ratchet. Turn it down until flush with housing.

NOTE

The two parts of the bevel gear carrier assembly are a matched set (line bored). If one is unserviceable, both must be replaced.

3. Inspect drive bevel gear carrier dowel pins and elbow. If elbow is damaged or missing, replace carrier. If dowel pins are missing or damaged, follow the dowel replacement procedure provided on page 3-15.

4. Inspect condition of 1/2-inch dowel pins on steer clutch housing. If damaged or missing, replace, using arbor press, so that 7/16 inch extends above housing surface. Three pins are associated with bearings on the sides. Follow dowel pin replacement procedures on page 3-15 if you need to remove these pins.

5. If any of the two plugs and pins of the torque converter housing are either missing or damaged, replace them by driving the plugs to shoulder with a hammer and straight and driving the pins in with a hammer and punch and staking over both ends of the pins

ASSEMBLE HELICAL GEAR (TRANSFER DRIVEN GEAR) ASSEMBLY (Sheet 1 of 2)

TOOLS: 3/4-in. drive torque wrench
Flat-tip screwdriver
Arbor press
Machinist's hammer
Punch
Vise with caps

SPECIAL TOOLS: Face wrench socket, P/N 8350702

PRELIMINARY PROCEDURE: Cleaning and Inspection (Page 3-75)

NOTE

The input drive and input driven bevel gears are a matched set. If one is replaced, both must be replaced.

1. Using arbor press, press bearing (A) numbered race upward onto shaft of input drive bevel gear (B). Using punch and hammer, stake inner race to shaft in three places, approximately 120 degrees apart, being careful not to distort inner race.

2. Turn assembly over in arbor press. Install transfer driven gear (C) onto splines on shaft of input drive bevel gear (B).

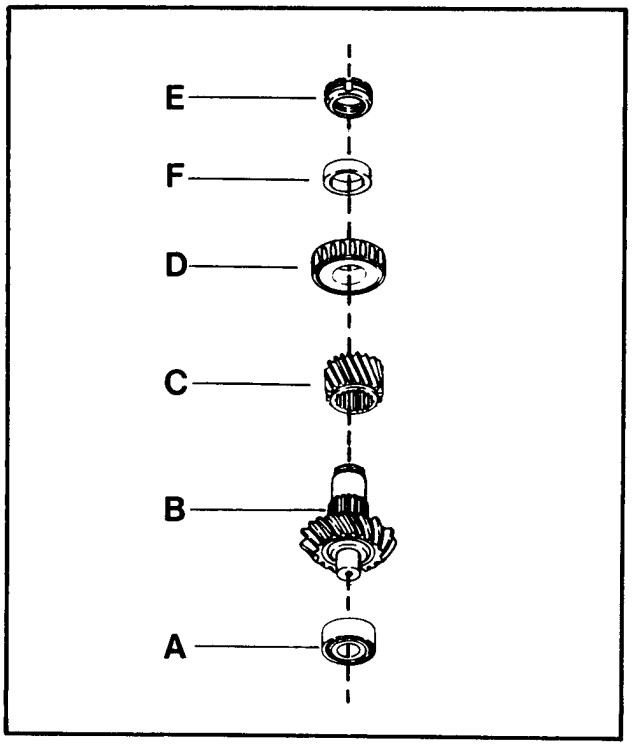
3. Using arbor press, press bearing inner race and rollers (D) onto shaft of input drive bevel gear (B).

NOTE

Left-hand round, plain nut (spanner nut) (E) is marked LH.

4. Clamp input drive bevel gear in vise with caps. Install spacer (F) and spanner nut (E) onto shaft.

Go on to Sheet 2



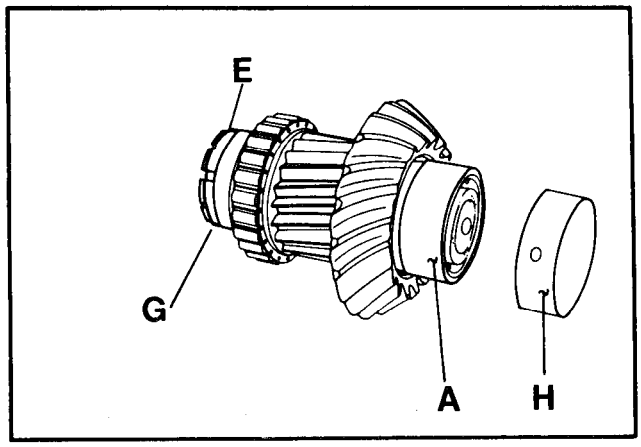
TA236592

ASSEMBLE HELICAL GEAR (TRANSFER DRIVEN GEAR) ASSEMBLY (Sheet 2 of 2)

5. Using face wrench socket and torque wrench, tighten spanner nut (E) to 300 lb-ft (407 N.m). Then tighten further, as necessary to aline retaining ring hole. Using screwdriver, install retaining ring (G). Using punch and hammer, stake metal over retaining ring (G) in three places, approximately 120 degrees apart.

6. Install bearing sleeve (H) onto bearing (A).

END OF TASK



TA236593

ASSEMBLE HELICAL GEAR (TRANSFER DRIVE GEAR) ASSEMBLY

TOOLS: 3/4-in. drive torque wrench
External retaining ring pliers
Arbor press
Machinist's hammer
Punch
Vise with caps

SPECIAL TOOLS: Face wrench socket, P/N 8350702

PRELIMINARY PROCEDURE: Cleaning and Inspection (Page 3-75)

1. Using arbor press, press bearings (A) and (B) onto shaft of gear (C).

NOTE

Left-hand round, plain nuts (spanner nuts) (D) are marked LH.

2. Clamp transfer drive gear (C) in vise with caps. Install one spanner nut (D) onto shaft of gear (C).

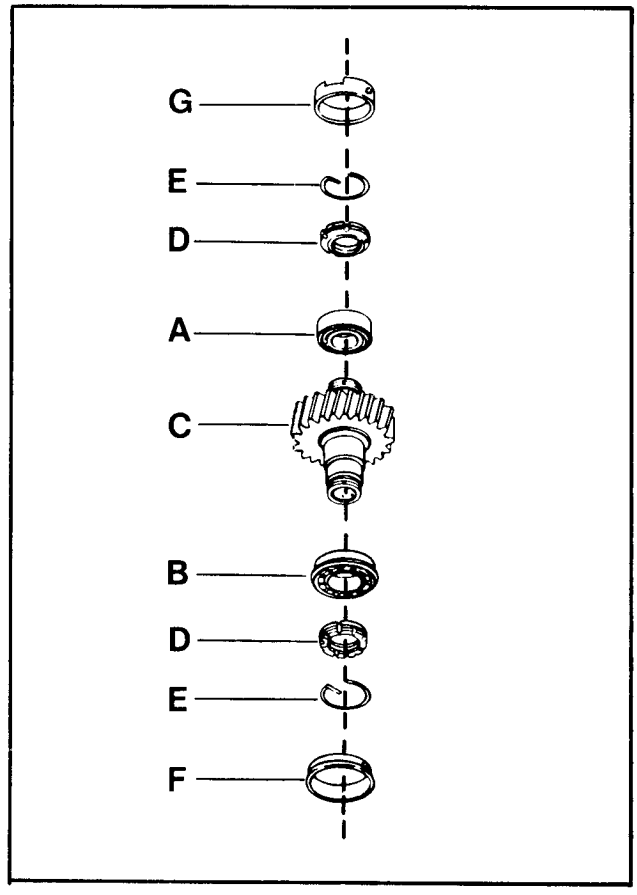
3. Using face wrench socket and torque wrench, tighten one spanner nut (D) to 300 lb-ft (407 N.m). Then tighten further, as necessary, to aline retaining ring hole. Install one retaining ring (E). Using punch and hammer, stake metal over retaining ring (E) in three places approximately 120 degrees apart.

4. Invert assembly in vise and repeat steps 2 and 3 on opposite end of gear (C).

5. Install sleeve bearing (F) onto bearing (B). Install sleeve bearing (G), notched end outward, onto bearing (A).

6. Using retaining ring pliers, install retaining ring into groove in bearing (B).

END OF TASK



TA236594

ASSEMBLE INPUT DRIVE BEVEL GEAR CARRIER

TOOLS: 5/8-in. 1/2-in. drive socket
1/2-in. drive torque wrench
Diagonal pliers
Arbor press
Small round nose pliers

SUPPLIES: Lock wire

PRELIMINARY PROCEDURE: Assemble Helical Gears (Pages 3-76 and 3-78)

1. Using arbor press, install bearing outer race (A) into bearing cage (B). Press race (A) to shoulder of cage (B). Install bearing (C), numbered side outward into bearing cage (B). Press bearing (C) until it seats against outer race (A).

2. Install assembled helical gear (transfer drive gear) assembly (D) into carrier (E). Rotate sleeve bearings until pins in carrier engage holes in sleeves.

3. Install bearing cage (B), with assembled parts, onto helical gear (transfer driven gear) assembly (F). Install entire assembly into input drive bevel gear carrier (E). Rotate sleeve bearing until carrier pin engages hole in sleeve.

NOTE

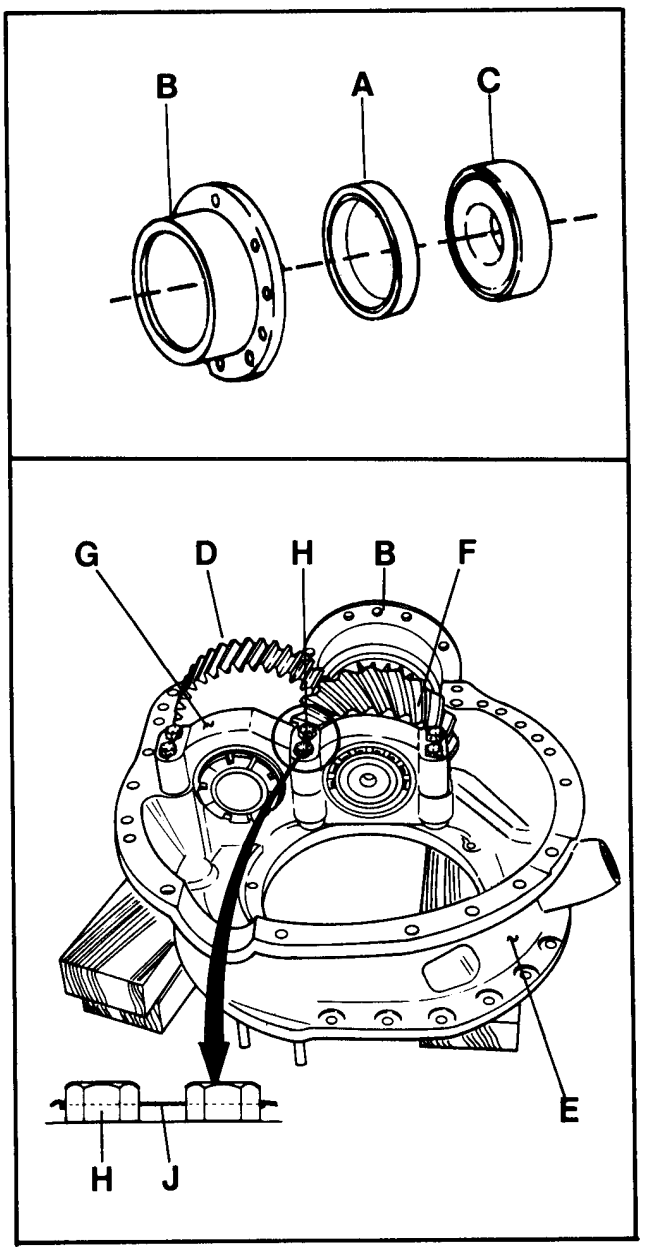
Check serial numbers on bearing cap (G) and carrier (E) to be sure they are matched.

4. Install bearing cap (G) and six bolts (H).

5. Using socket and torque handle, tighten six bolts (H) to 64 to 77 lb-ft (87 to 104 N.m).

6. Using small round nose pliers, lock wire six bolts (H). Using diagonal pliers, trim lock wires (J).

END OF TASK



TA236595

ASSEMBLE AND INSTALL RIGHT-STEER CLUTCH HUB AND CONVERTER INPUT SHAFT
(Sheet 1 of 2)

TOOLS: 7/16-in. 1/2-in. drive socket
9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
1/2-in. drive 5-in. long extension
Flat-tip screwdriver
Arbor press
Machinist's hammer
Straight
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling,
P/N 7083778

SUPPLIES: Wood blocks of various sizes
3/8-24 x 3-in. guide bolt (two required)

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Assemble Input Drive Bevel Gear Carrier
(Page 3-79)

1. Using arbor press, press inner race and rollers (A) onto converter input shaft (B).

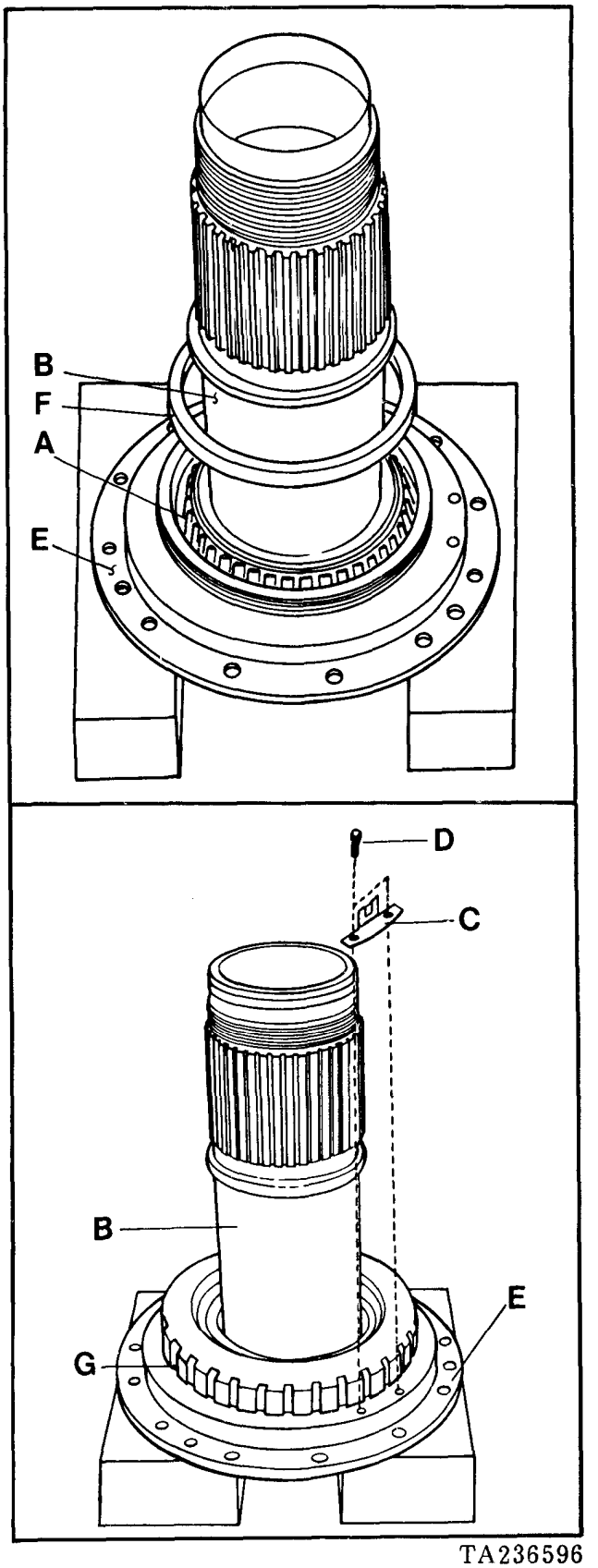
2. Install retainer nut lockplate (C) and two bolts (D) on right-steer clutch hub (E). Using 7/16-inch socket and torque wrench, tighten two bolts (D) to 10 to 12 lb-ft (14 to 16 N.m).

3. Place right-steer clutch hub (E) on work surface, supported on wood blocks.

4. Install converter input shaft (B) into clutch hub (E). Install outer race (F) into hub (E). Using straight and hammer, tap outer race (F) into hub to within 3/8 inch of the threaded shoulder.

5. Install bearing retainer nut (G) and run up finger tight.

Go on to Sheet 2.



TA236596

ASSEMBLE AND INSTALL RIGHT-STEER CLUTCH HUB AND CONVERTER INPUT SHAFT (Sheet 2 of 2)

CAUTION

Prevent bearing cage from falling out while turning over input bevel gear carrier (H).

6. Using hoist and sling, position input bevel gear carrier (H) on work surface supported on wood blocks with gears downward.

7. Install two guide bolts (J) into carrier (H). Install assembled clutch hub and input shaft assembly (K) into carrier (H), being careful to aline oil passage holes in hub with those in carrier.

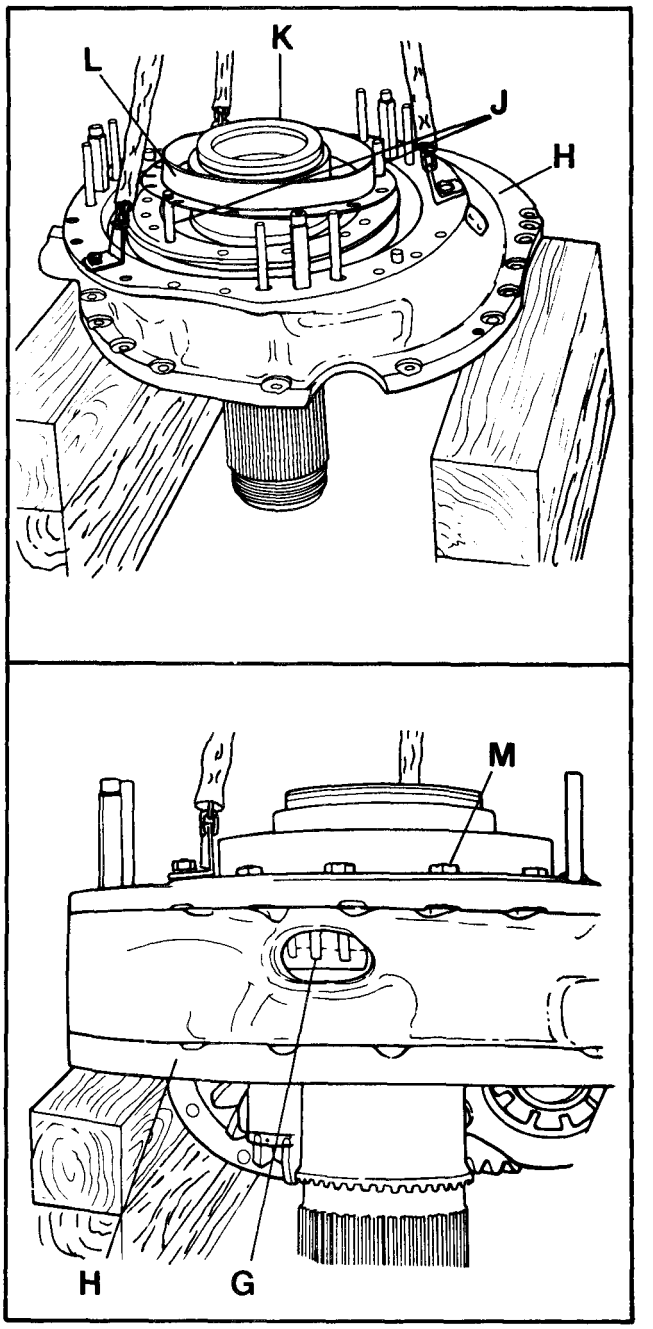
8. Install steering baffle (L), being careful to aline oil passage holes in baffle with those in hub. Install ten bolts (M).

9. Remove two guide bolts (J) and install remaining two bolts (M). Using 9/16-inch socket and torque wrench, alternately tighten bolts to draw hub into carrier, checking frequently to be sure that retainer nut (G) does not bind against bearing cap in carrier (H) and if binding occurs, insert screwdriver through access hole in carrier and tighten retainer nut (G) sufficiently to provide clearance. Tighten 12 bolts (M) to 41 to 49 lb-ft (56 to 66 N.m).

10. Using hoist and sling, invert driven bevel gear carrier (H) and place it on wood blocks.

11. Remove hoist and sling.

END OF TASK



TA236597

ASSEMEILE INPUT DRIVE GEARS (Sheet 1 of 4)

TOOLS: 5/8-in. 1/2-in. drive socket
3/4-in. 1/2-in. drive socket
9/16-in. 1/2-in. drive socket
Arbor press
11/16-in. open end wrench
5/8-in. combination wrench
Hoist, 2-ton minimum capacity
1/2-in drive torque wrench
Plastic insert hammer
9/16-in. combination wrench
9/16-in. 1/2-in. drive crowfoot

SPECIAL TOOLS: Lifting sling,
P/N 7083778

SUPPLIES: Wood blocks of various sizes
3/18-24 x 3-in. long guide bolt
(two required)

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Install Clutch Hub and Converter Shaft (Page 3-80)

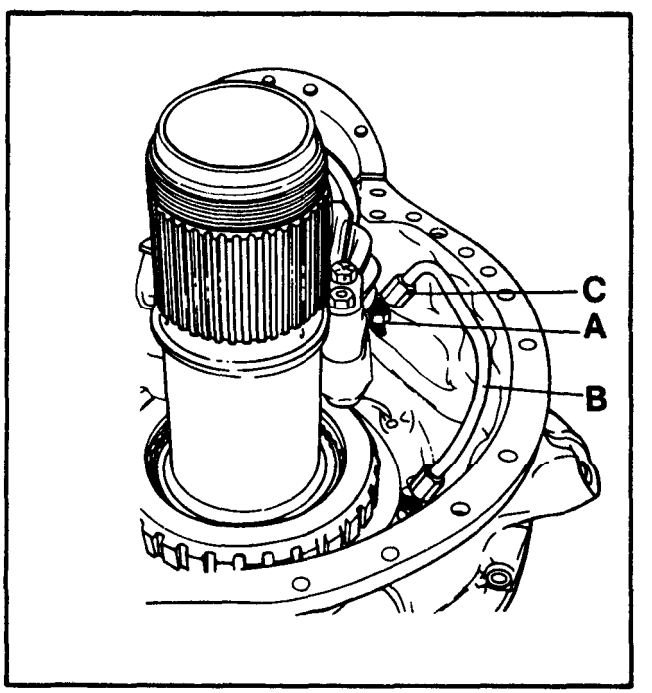
1. Using 5/8-inch combination wrench, install two tube coupling nuts (connector bodies) (A) in driven bevel gear carrier. Using open end wrench, tighten sufficiently to prevent leakage.

NOTE

If metal bent tube (oil transfer tube) removed at disassembly is used, it will be an assembly consisting of a bent tube with a straight adapter (connector nut) and clinch sleeve (compression sleeve) on each end. If the tube is replaced with a new tube, new nuts and sleeves should also be used.

2. Be sure oil transfer tube (B) has a nut and compression sleeve on each end. Then, using open end wrench, install the assembly with two nuts (C) on connector bodies (A).

3. Using open end wrench, tighten two nuts (C) sufficiently to prevent leakage.



TA236598

Go on to Sheet 2.

ASSEMBLE INPUT DRIVE GEARS (Sheet 2 of 4)

4. Using hoist and sling, position drive bevel gear carrier (D) on work surface supported on wood blocks with the gears upward. Remove sling.

5. Using hoist and sling, install driven bevel gear carrier (E) onto drive bevel gear carrier (D).

6. Install four bolts (F) approximately 90 degrees apart to join mating surfaces (G).

7. Using 9/16-inch combination wrench, tighten four bolts (G) sufficiently to securely hold carriers together.

8. Install oil inlet neck and tube assembly (H). Tap with hammer to seat assembly (H).

9. Install bolt (J).

10. Using 9/16-inch socket and torque wrench, tighten bolt (J) to 36 to 43 lb-ft (49 to 58 N.m)

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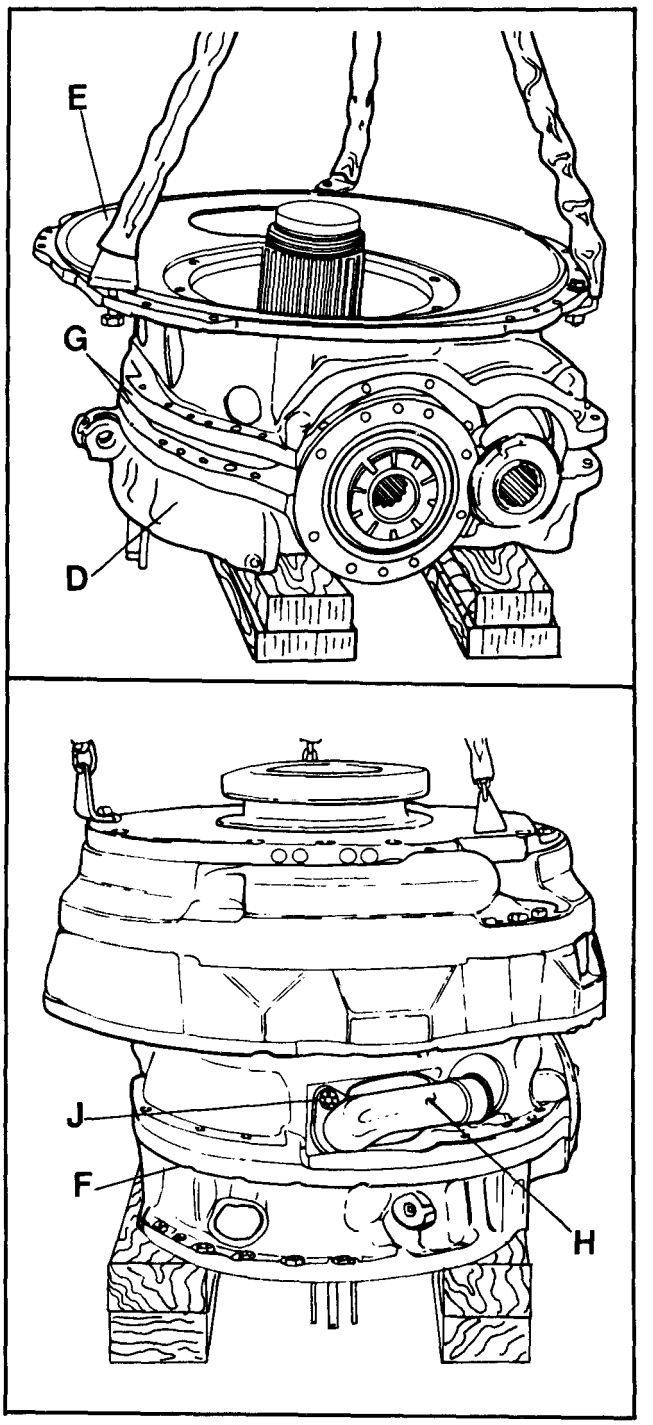


TA236599

ASSEMBLE INPUT DRIVE GEARS (Sheet 3 of 4)

NOTE

If the gears or the housing were not replaced, the old shims (K) may be reused. If new shims (K) are needed, use a thickness of 0.024 inch as a starting point.

11. Position shims (K) between cage (L) and carrier.

12. Install two 3/8-24 x 3-inch long guide bolts (M) into cage (L). Install bearing retainer (N) onto cage (L).

13. Install six bolts (P) into retainer (N). Remove guide bolts (M) and install remaining two bolts (P). Using 9/16-inch socket and torque wrench, alternately tighten eight bolts to draw cage evenly into carriers. Tighten eight bolts to 41 to 49 lb-ft (56 to 66 N.m)

14. Using arbor press, press bearing outer race, numbered side downward, into bearing retainer (Q).

NOTE

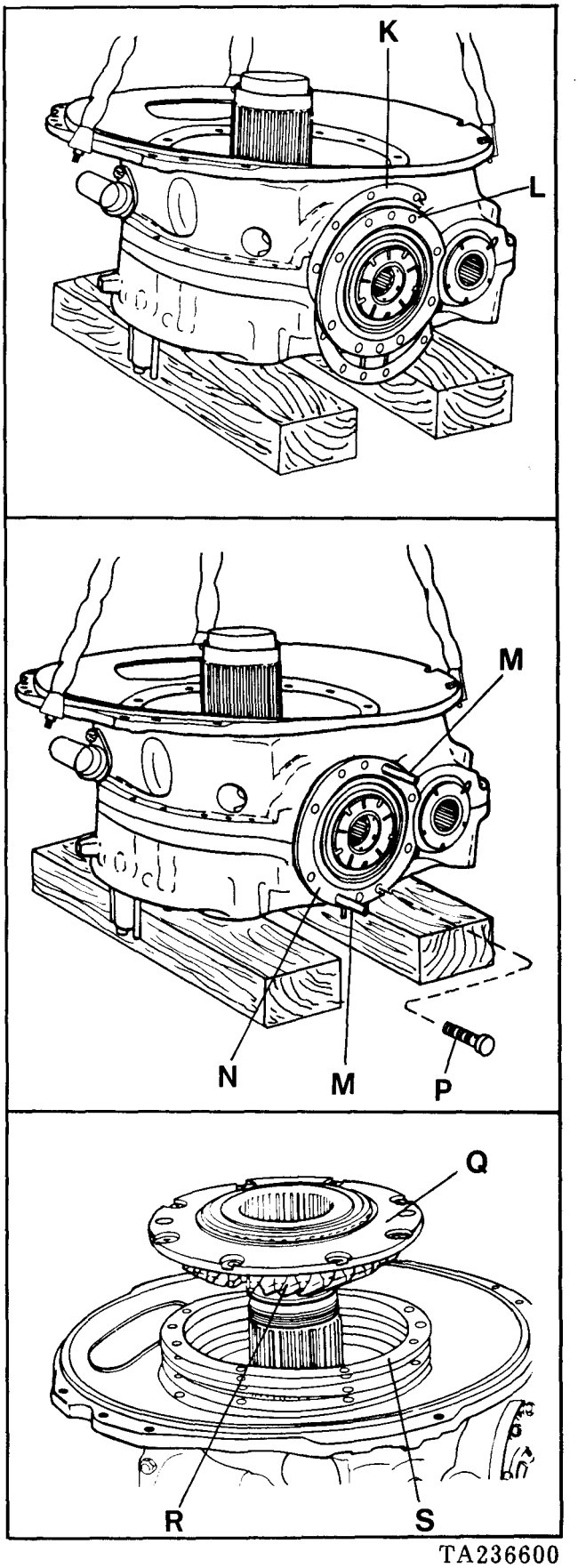
The input driven bevel gear (R) and input drive bevel gear are a matched set. If one is replaced, both must be replaced.

15. Position input driven bevel gear (R) in arbor press. Place bearing retainer (Q) onto gear (R) and, using arbor press, press bearing inner race onto input bevel gear (R).

NOTE

If the shims (S) that were removed during disassembly are not reused, use new shims (S) with a thickness of 0.040 inch as a starting point.

Go on to Sheet 4.



TA236600

ASSEMBLE INPUT DRIVE GEARS (Sheet 4 of 4)

16. Install two 1/2-13 x 3-inch long guide bolts (T). Install shims (S) and assembled input bevel gear, bearing and retainer.

17. Install six bolts (U) into retainer (Q). Remove guide bolts (T). Install remaining two bolts (U). Alternately tighten eight bolts (U) to draw retainer (Q) into carrier. Using 3/4-inch socket and torque wrench, tighten eight bolts (U) to 81 to 97 lb-ft (110 to 132 N.m).

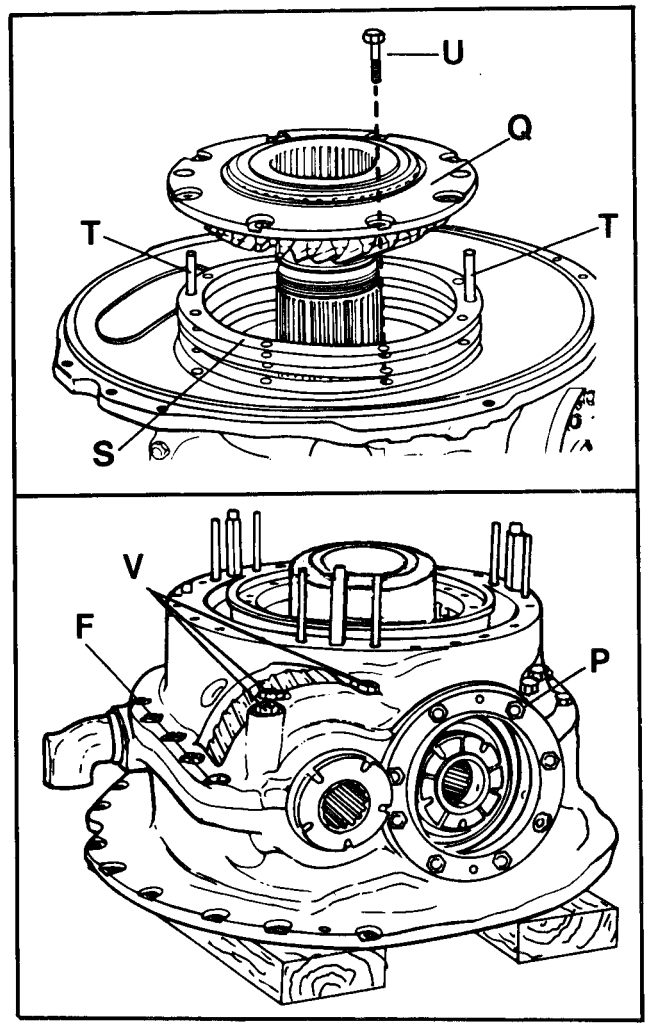
18. Using hoist and sling, invert input gearing assembly and position it on work surface supported on wood blocks with right-steer clutch hub upward.

19. Install remaining 11 bolts (F).

20. Using 9/16-inch crowfoot and torque wrench, tighten all 15 bolts (F) to 41 to 49 lb-ft (56 to 66 N.m).

21. Using 5/8-inch socket and torque wrench, install five bolts (V) and tighten to 64-77 lb-ft (87 to 104 N.m).

END OF TASK



TA236601

INSTALL RIGHT-STEER CLUTCH (Sheet 1 of 3)

TOOLS: 1/2-in. 3/8-in. drive socket
3/8-in. drive 6-in. long extension
3/8-in. drive torque wrench
External retaining ring pliers
Plastic insert hammer
Center punch
Machinist's hammer

SUPPLIES: Wood blocks of various sizes

PRELIMINARY PROCEDURE: Assemble Input Drive Gears (Page 3-82)

1. If hub clutch disk (clutch hub) (A) and differential ring steer gear (B) were separated, place ring steer gear (B) on work surface with flange side upward. Position clutch hub (A) on ring steer gear (B).

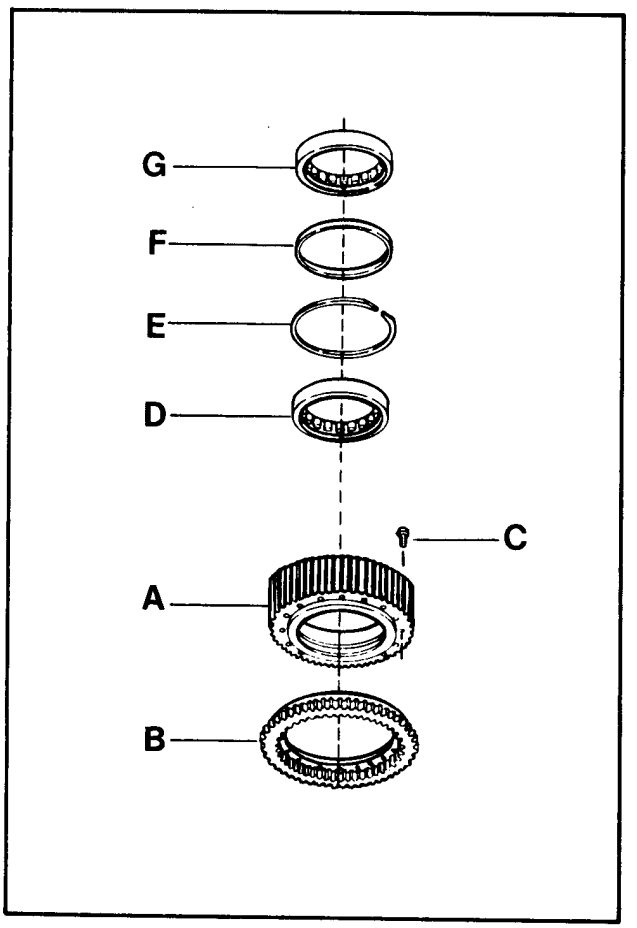
2. Install 16 bolts (C). Using socket, extension, and torque wrench, tighten 16 bolts (C) to 19 to 23 lb-ft (26 to 31 N.m).

3. Invert assembled hub (A) and gear (B) on work surface. Using center punch and hammer, stake ends of 16 bolts (C) to ring gear (B).

4. Again, invert assembly on work surface.

5. Insert inner bearing (D), retaining ring (E), spacer (F), and outer bearing (G) into base of hub. Use plastic insert hammer, if necessary, to gently seat outer bearing against spacer.

Go on to Sheet 2.



TA236602

INSTALL RIGHT-STEER CLUTCH (Sheet 2 of 3)

6. Position input gearing housing (H) on work surface supported on wood blocks with right-steer clutch hub (J) upward.

7. Install compression cup (K) in groove in input gearing housing (H) bore.

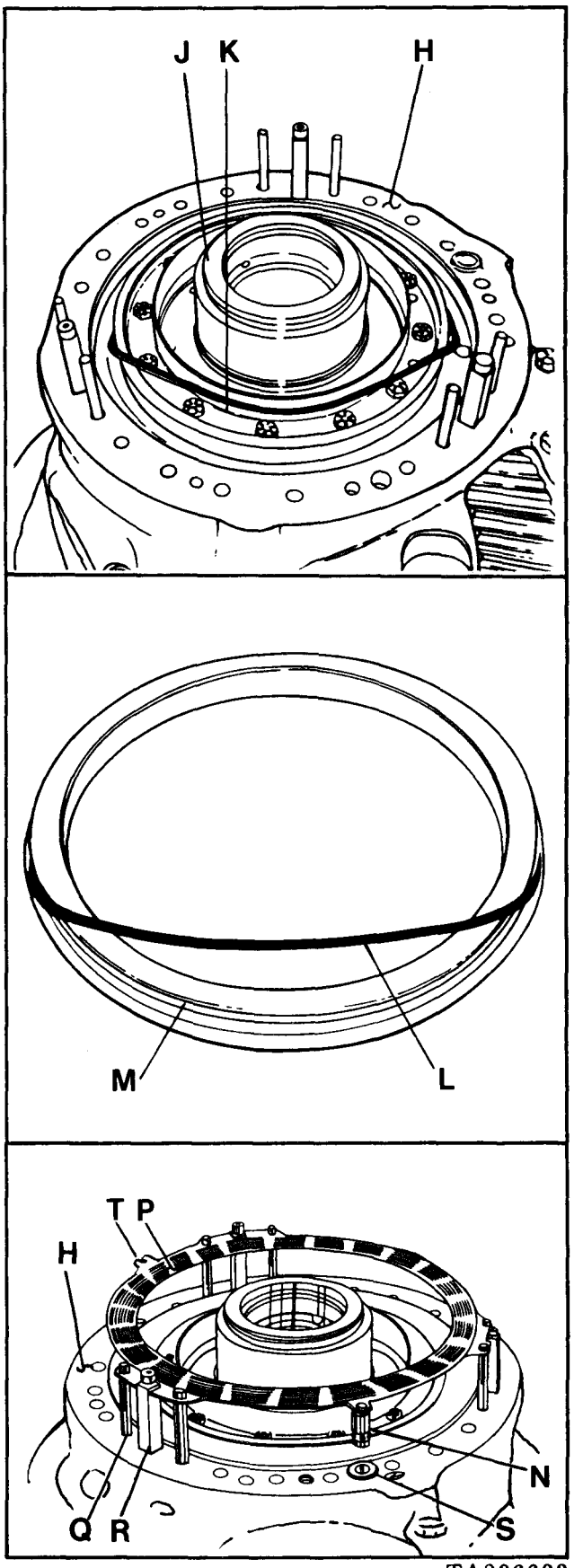
8. Install seal ring (L) in groove on piston (M).

9. Install piston (M) in input gearing housing (H) bore.

10. Insert lubricating valve (N) into tab on piston reaction plate (P).

11. Install reaction plate (P) on dowels (Q) and keys (R) on housing (H) so that valve (N) is alined with valve sleeve (S) in housing and the other tab (T) is over the bump on the bevel gear drive housing.

Go on to Sheet 3.



TA236603

INSTALL RIGHT-STEER CLUTCH (Sheet 3 of 3)

12. Install six springs (U) on dowels (Q).

13. Install clutch plates (V) starting with an internal-splined plate, alternately install six internal-splined plates and five external-tanged plates. Aline external tangs, making sure that external tangs engage three keys (R).

14. Invert hub and ring gear assembly (W) and place on clean work surface, ring side downward.

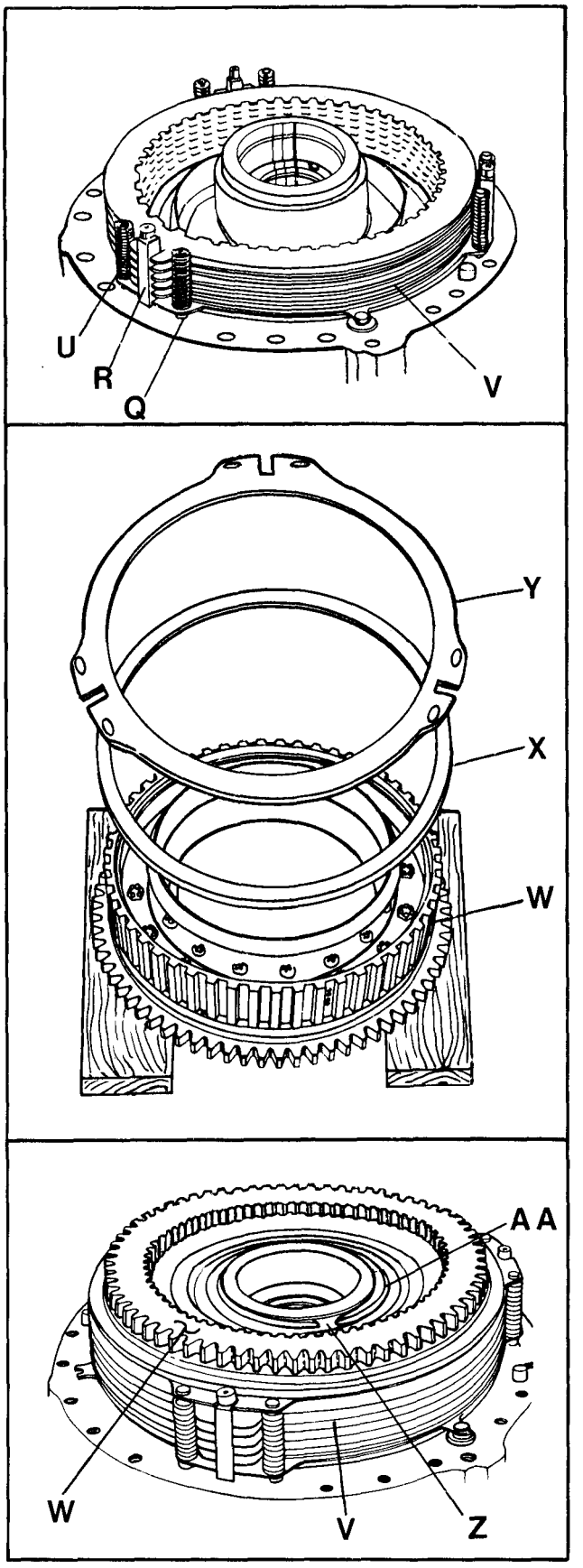
15. Install back plate (X), step side first, onto gear and hub assembly (W).

16. Install reaction plate (Y), smooth side first, onto back plate (X).

17. Holding the assembled unit together, invert the assembly and install the assembly, alining the splines in hub with internal-splines of clutch plates (V).

18. Using hammer and punch, install bearing retainer plate (Z) with the inner diameter chamber facing downwards and using retaining ring pliers, install retaining ring (AA).

END OF TASK



TA236604

INSTALL STEER DIFFERENTIAL ASSEMBLY

TOOLS: Machinist's hammer
Arbor press

PRELIMINARY PROCEDURE: Install Right Steer Clutch (Page 3-86)

NOTE

If pinion gears are to be replaced, they must be replaced as a matched set.

1. Install eight pinions (A) and 16 thrust washers (B) in carrier (C). Using arbor press, alining slot in spindles (D) with holes in carrier (C), press eight spindles (D) into carrier (C) and through pinions (A) and thrust washers (B).

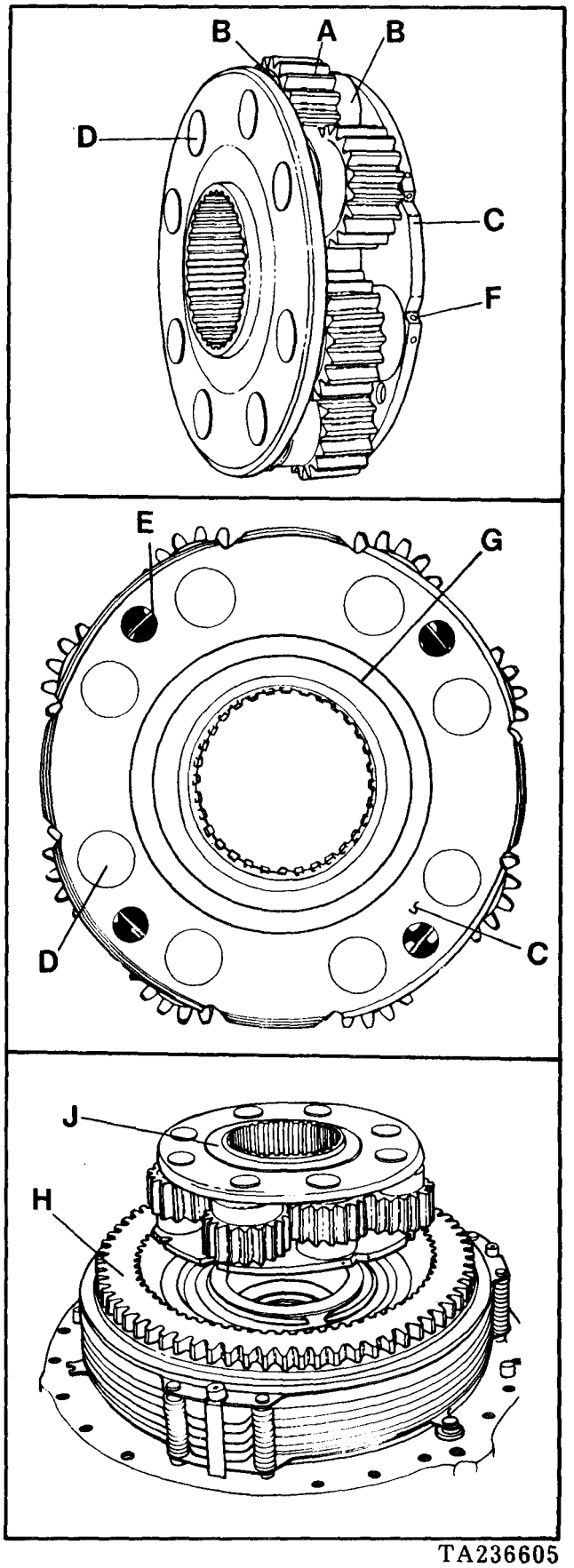
2. Using hammer, tap four lock pins (E) into lock pin holes (F) in carrier. Bend lock pins (E) to secure.

3. Using sufficient petrolatum to hold in place, install thrust washer (G) onto carrier (C).

4. Install steer differential assembly, splined end upward, into right-steer clutch hub, alining pinions (A) with differential ring gear (H).

5. Install thrust washer (J) on splined end of steer differential assembly.

END OF TASK



TA236605

ASSEMBLE STEER CLUTCH HOUSING COVER

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
1/2-in. drive 5-in. long extension
External retaining ring pliers
Plastic insert hammer
Arbor press

PRELIMINARY PROCEDURE Install Steer Differential Assembly (Page 3-89)

NOTE

Bearing inner race and rollers (A) to be installed on hub (B) is mated with the bearing outer race installed in the reverse range carrier. Be sure serial numbers are matched.

1. Using arbor press, press bearing inner race and rollers (A) onto hub (B). Press bearing to shoulder.
2. Using retaining ring pliers, install retaining ring (C).
3. Invert hub so that it is resting on bearing end.

NOTE

If pins, keys, and/or lubrication valve sleeve were removed from cover (D), press new ones into cover (D) at this time.

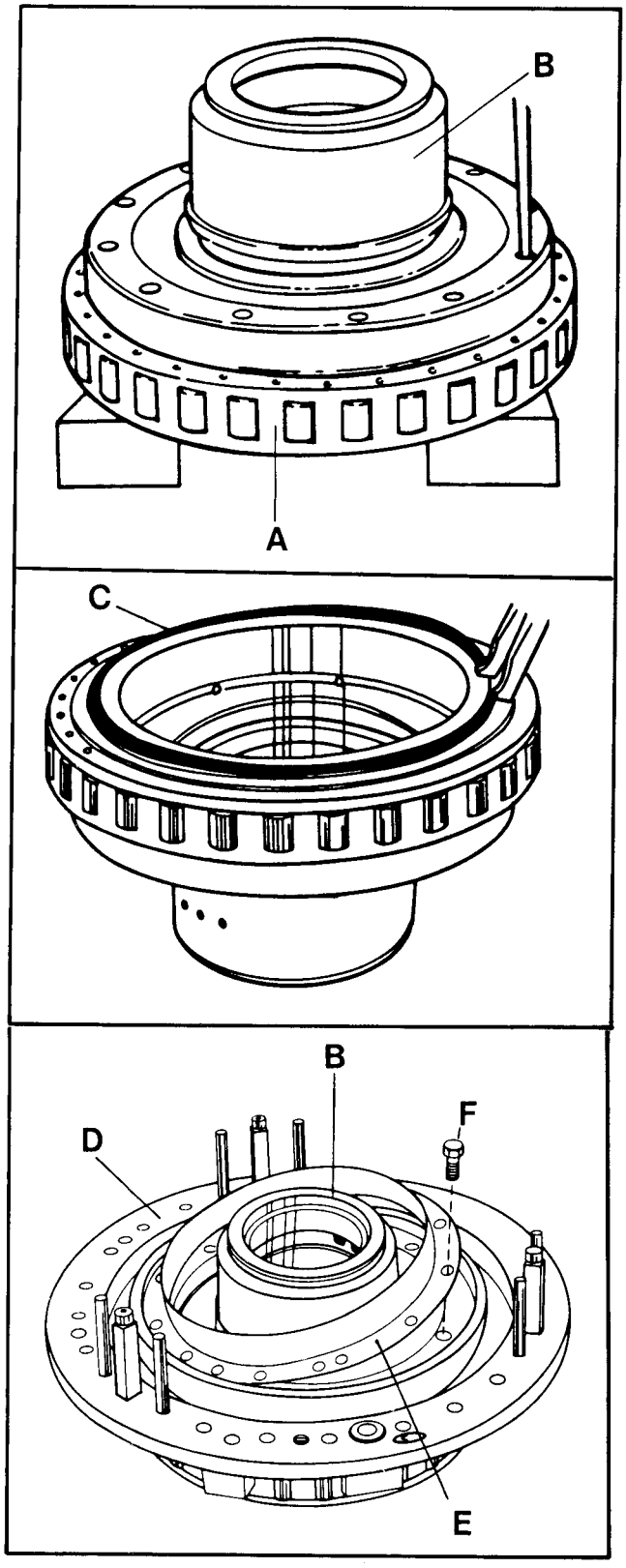
4. Position cover (D) on hub (B). Use plastic hammer to seat cover on hub.

NOTE

Make sure oil holes are lined up.

5. Install bearing baffle (E) and 12 bolts (F).
6. Using socket, extension, and torque wrench, tighten 12 bolts (F) to 41 to 49 lb-ft (56 to 66 N.m).

END OF TASK



TA236606

INSTALL LEFT-STEER CLUTCH (Sheet 1 of 2)

TOOLS: 1/2-in. 3/8-in. drive socket
3/8-in. drive 6-in. long extension
3/8-in. drive torque wrench
External retaining ring pliers
Center punch
Straight
Machinist's hammer
Plastic insert hammer

SUPPLIES: Wood blocks of various sizes

PRELIMINARY PROCEDURE: Assemble Steer Clutch Housing Cover (Page 3-90)

1. If clutch hub (A) and differential ring gear (B) were separated, place ring steer gear (B) on work surface with flange side upward.

2. Position clutch hub (A) on ring steer gear (B). Install 16 bolts (C). Using socket, extension, and torque wrench tighten 16 bolts (C) to 19 to 23 lb-ft (26 to 31 N.m).

3. Invert assembled hub and gear on work surface. Using center punch and hammer, stake ends of 16 bolts (C) to ring steer gear.

4. Again, invert assembly on work surface.

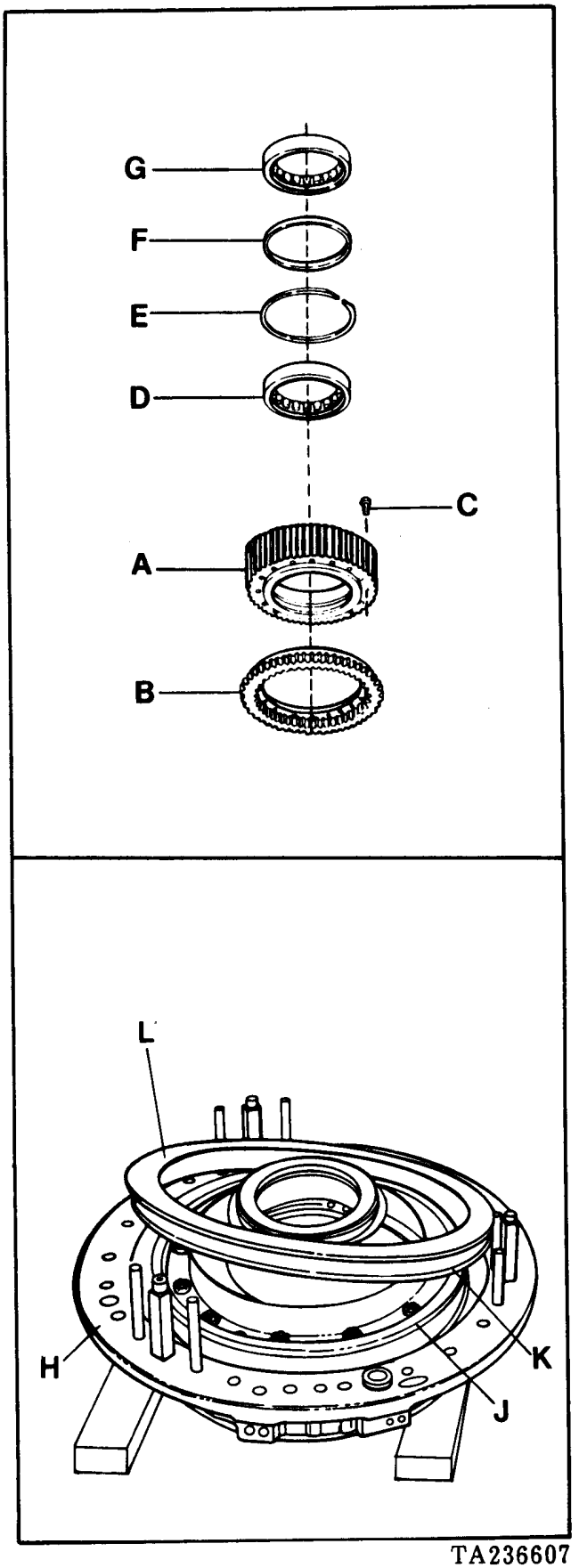
5. Insert inner bearing (D), retaining ring (E), spacer (F), and outer bearing (G) into base of hub. Use plastic insert hammer gently seat outer bearing against spacer.

6. Position input gearing housing (H) on work surface supported on wood blocks with left-steer clutch hub upward.

7. Install compression cup (J) in groove in housing (H) bore.

8. Install seal ring (K) in groove on piston (L).

Go on to Sheet 2.



TA236607

INSTALL LEFT-STEER CLUTCH (Sheet 2 of 2)

9. Install piston (L) in housing (H) bore.

10. Insert lubricating valve (M) into tab on piston reaction plate (N).

11. Install reaction plate (N) on dowels (P) and keys (Q) on housing (H) so that valve (M) is alined with valve sleeve (R) in housing cover. If the valve is considered to be in the 12 o'clock position, then the unused tab (S) is in the 8 o'clock position.

12. Install six springs (T) onto dowels (P).

13. Install clutch plates (U) starting with an internal-splined plate and alternately installing six internal-splined plates and five external-tanged plates.

14. Invert hub and ring gear assembly (V) and place on clean work surface, ring side downward.

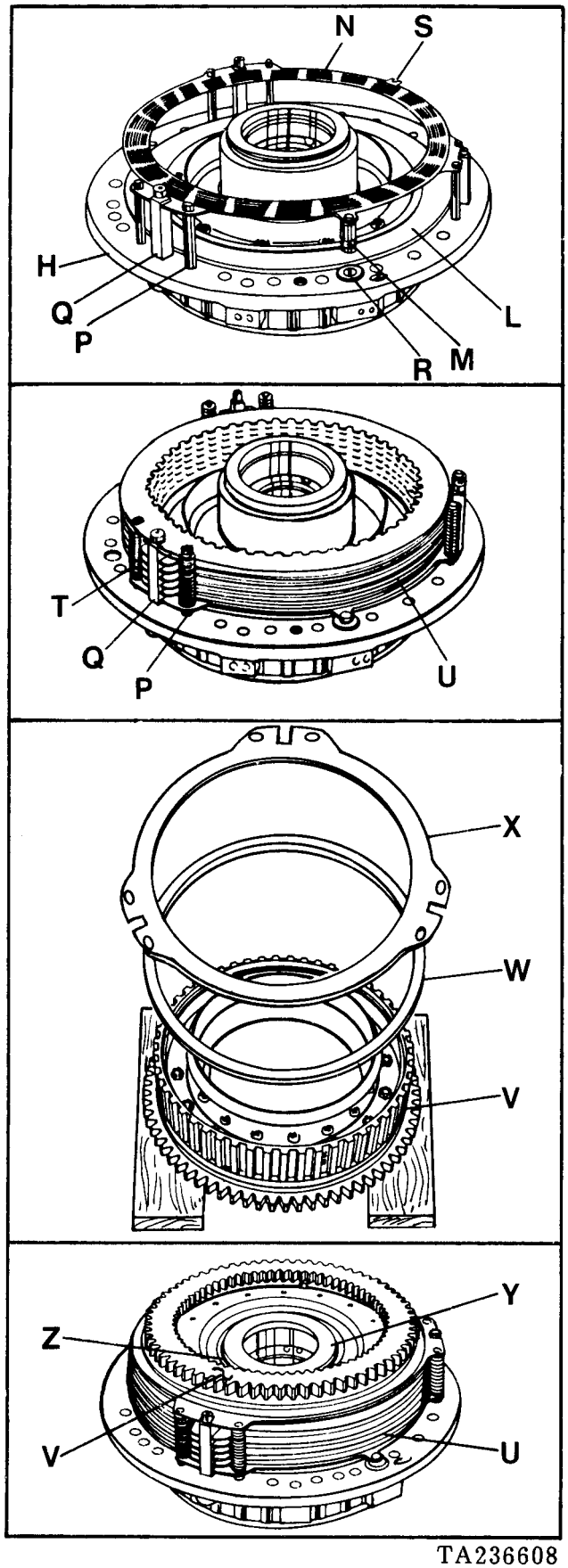
15. Install back plate (W), step side first, onto gear and hub assembly (V).

16. Install reaction plate (X), smooth side first onto back plate (W).

17. Holding the assembled unit together, invert the assembly and install the assembly, alining the splines in hub with internal-splines of clutch plates (U).

18. Using hammer and punch, install bearing retainer plate (Y) with the inner diameter chamfer facing downwards and using retaining ring pliers, install retaining ring (Z).

END OF TASK



TA236608

INSTALL STEER CLUTCH HOUSING

TOOLS: 9/16-in. box wrench
9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling, P/N 7083778

SUPPLIES: 3/8-16 x 2-in. bolt (two required)
3/8-16 nut (two required)

PRELIMINARY PROCEDURE: Install Left-Steer Clutch (Page 3-91)

1. Using hoist and sling, position housing (A) on housing cover and left-steer clutch assembly, taking care to aline the dowel pin with the dowel pin hole.

NOTE

Check at location (B) to be sure tang of reaction plate is visible.

2. Install two bolts (C) 180 degrees apart. Using box wrench tighten two bolts (C).

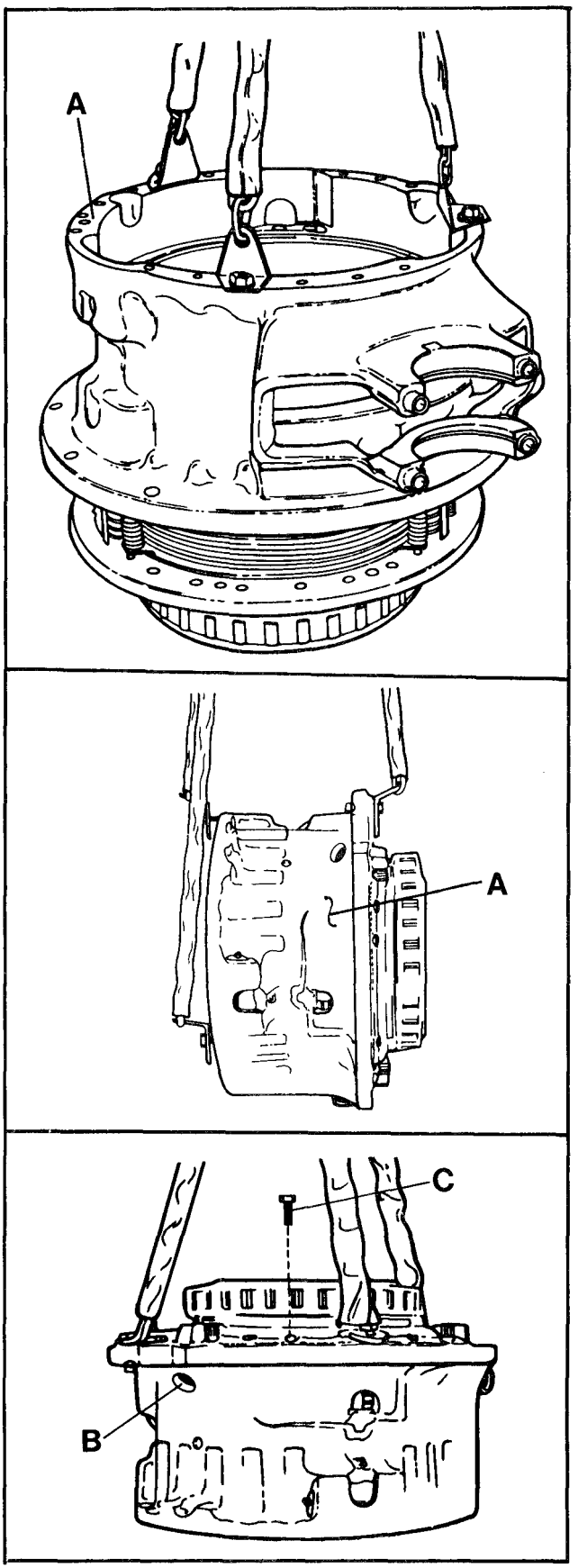
3. Detach one leg of the sling and reattach the leg of sling to other side of housing (A) using one 3/8-16 x 2-inch bolt and 3/8-16 nut. Raise steer clutch housing (A) to vertical position.

4. Detach two legs of sling from the flat side of housing (A) and reattach the two legs of sling to the bearing side. Using hoist and sling, invert entire assembly on work surface.

5. Install remaining 16 bolts (C).

6. Using socket and torque wrench, tighten 18 bolts (C) to 41 to 49 lb-ft (56 to 66 N.m).

END OF TASK



TA236609

ASSEMBLE AND INSTALL SPUR GEARS (STEER OUTPUT GEARS)

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
1/2-in. drive 5-in. long extension
External retaining ring pliers
Diagonal pliers
Straight
Machinist's hammer

PRELIMINARY PROCEDURE: Install Steer Clutch Housing (Page 3-93)

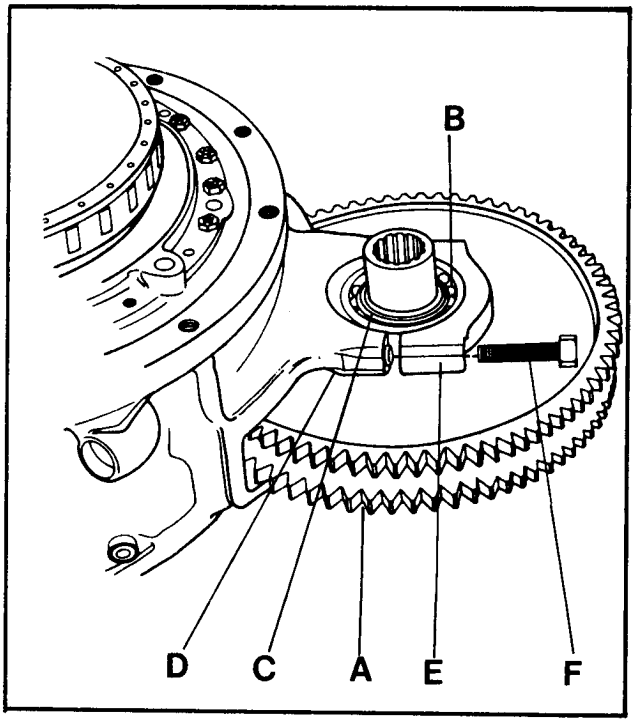
1. Place two steer drive gears (A) on work surface with hubs upward.
2. Install two retaining rings on outer races of two bearings (B).
3. Install one bearing (B) in each steer drive gear (A) with retaining ring toward gear. Use straight and hammer to tap inner race of bearings (B) onto gear hubs until retaining rings seat against hubs.
4. Using retaining ring pliers, install two retaining rings (C), one in each gear hub, with numbered side of rings (C) facing upward.
5. Place flat side of two gears (A) together. Install two gears (A) in pillow blocks (D) in housing. Retaining ring should fit into slot in housing.

NOTE

Bearing caps are matched to the steer clutch housing. Check to be sure serial numbers on caps match serial number on housing.

6. Install two bearing caps (E). Install four bolts (F). Using socket, extension, and torque wrench, tighten four bolts (F) to 33 to 40 lb-ft (45 to 54 N.m).
7. Lock wire four bolts (F). Use diagonal pliers to trim lock wire.

END OF TASK



TA236610

INSTALL STEER CLUTCH ASSEMBLY

TOOLS: 1/2-in. drive universal joint
9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling,
P/N 7083778

PRELIMINARY PROCEDURE: Assemble and Install Steer Output Gears (Page 3-94)

1. Using hoist and sling, position steer clutch assembly (A) on input bevel gear assembly (B). Lower assembly (A) slowly, turning steer output gears as necessary to aline right output gear with right differential gear and left-steer clutch hub with steer differential pinions. The dowel pins (C) will mate with the dowel pin holes.

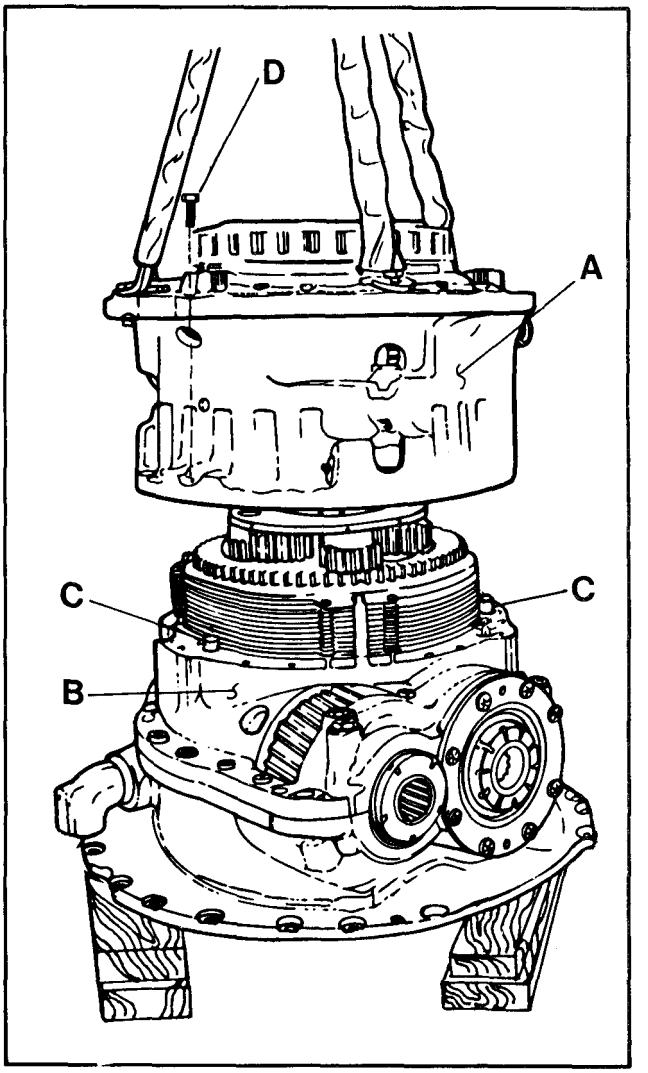
NOTE

Use semicircular casting holes on side of steer clutch housing as visual inspection holes to check for proper alinement of piston return plates.

2. Install 18 bolts (D).

3. Using socket, universal joint, and torque wrench, tighten 18 bolts (D) to 41 to 49 lb-ft (56 to 66 N.m).

END OF TASK



TA236611

ASSEMBLE AND INSTALL TURBINE COVER (Sheet 1 of 6)

TOOLS: 1-1/8-in. 1/2-in. drive socket
1/2-in. drive pound-inch torque wrench
1/2-in. drive breaker bar
3/4-in. drive breaker bar
3/4-in. drive pound feet torque wrench
Flat-tip screwdriver
1/8-in. socket head screw key
Depth micrometer
Long shank punch
Center punch
Machinist's hammer
Dial indicator with extension
Hoist, 2-ton minimum capacity
Pry bar (two required)
Straight

SPECIAL TOOLS: Lifting sling, P/N 7083778
Pinion turning wrench, P/N 7081564
Face wrench socket, P/N 8350703
Backlash setting fixture, P/N 8355779

SUPPLIES: Wood blocks of various sizes
Red lead
Small container of gear paint
Artist's brush

PERSONNEL: Two persons required

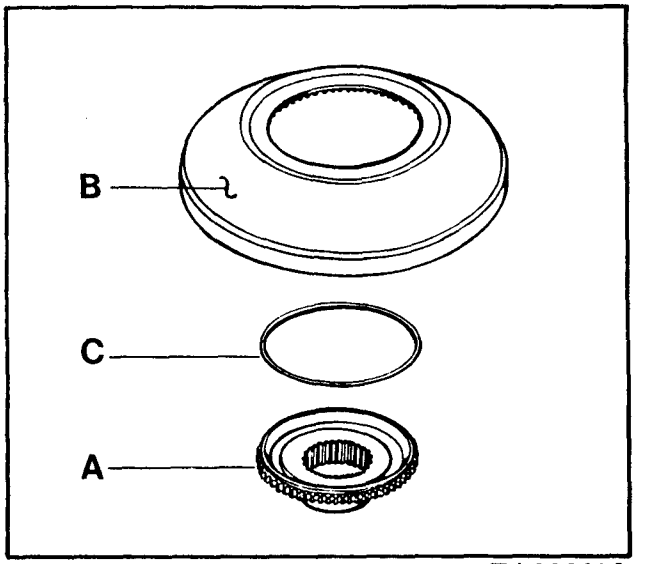
PRELIMINARY PROCEDURE: Install Steer Clutch Assembly (Page 3-95)

ASSEMBLE TURBINE COVER AND HUB

NOTE

If hub (A) was not removed from turbine cover (B) during disassembly, steps 1 and 2 may be omitted. If hub (A) was removed from turbine cover (B), these items must be reassembled as directed below.

1. Support hub (A) on wood block, flat side upward. Install seal (C) onto hub (A). Install turbine cover (B) onto hub (A).



TA236612

Go on to Sheet 2.

ASSEMBLE AND INSTALL TURBINE COVER (Sheet 2 of 6)

2. Heat retaining ring (D) to 500°F (260°C). Install ring (D) onto hub of turbine cover (B) and allow to cool.

3. Detach one leg of sling. Invert inner unit (E), letting unit ride on wood blocks to avoid damage to bearing. Let unit rest on work surface, steer clutch (F) end downward. Bolt inner unit (E) securely to work surface. It is suggested that bolts (G) be inserted from beneath work surface and threaded into steer clutch housing flange.

4. Remove hoist and sling.

5. Insert input shaft (H) into input drive gear (J). Insert bevel gear wrench (K) into power take-off splines. Use socket and 1/2-inch breaker bar as shown to prevent input bevel gear from turning.

NOTE

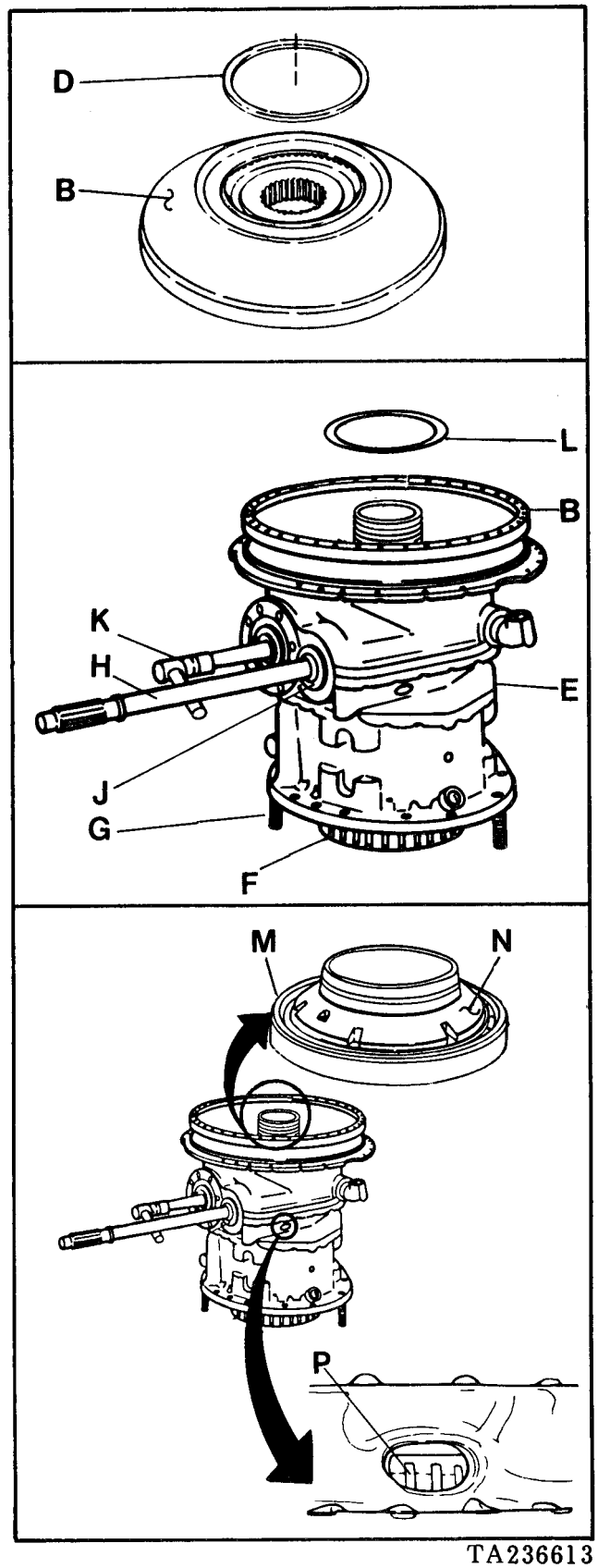
To obtain measurements necessary for final assembly, some parts are assembled out of sequence. After measurements are taken and recorded, these parts are disassembled so that proper assembly can be accomplished.

6. Install turbine cover (B), spacer (L). Using hammer and straight, install bearing (M), numbered side upward. Install spanner nut (N).

NOTE

Check to be sure that bearing retainer nut (P) on converter input shaft remains loose and is not pulled into a bind while bringing spanner nut (N) to full torque.

Go on to Sheet 3.



TA236613

ASSEMBLE AND INSTALL TURBINE COVER (Sheet 3 of 6)

7. Using spanner wrench and 3/4-inch drive torque wrench, tighten spanner nut (N) to 450 lb-ft (610 N.m).

8. Remove spanner wrench. Using depth micrometer (Q), measure and record distance from top of inner race of bearing (M) to top of shaft (R). Scribe a mark on the end of the shaft (R) alined with setscrew hole (S) in spanner nut (N).

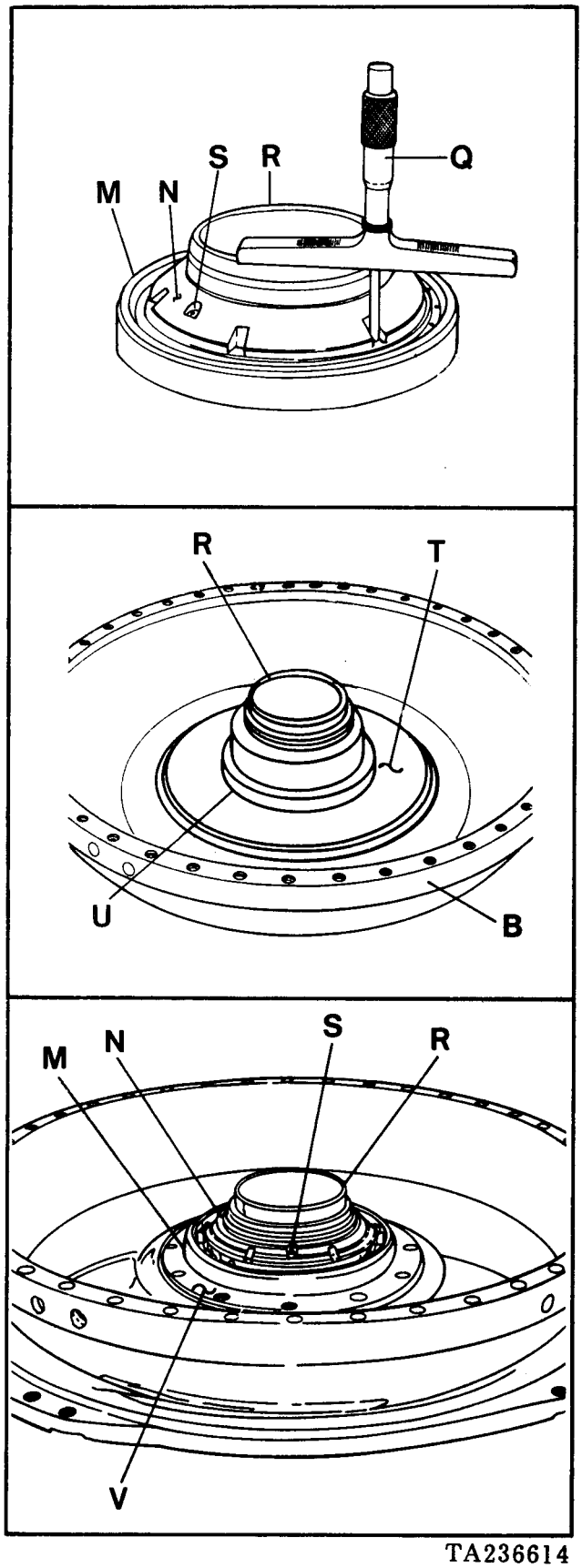
9. Using spanner wrench and 3/4-inch drive breaker bar, remove spanner nut (N). Remove bearing (M) and spacer.

10. Rotate turbine cover (B) until setscrew hole alines with mark scribed on shaft (R). Install Belleville spring (T), convex side upward, and spacer (U). Install bearing retainer (V), grooved side upward. Install bearing (M), numbered side upward. Install spanner nut (N).

11. Install spanner wrench so that hole in spanner wrench is over hole for set screw (S). Using spanner wrench and 3/4-inch drive torque wrench, tighten spanner nut (N) to 450 lb-ft (610 N.m). Distance from top of inner race of bearing (M) to top of shaft (R) must be within .020 inch (0.51 mm) of that recorded in step 8. Make minor adjustment, if necessary and aline setscrew holes.

12. Using socket head screw key, install and tighten set screw (S). Using punch and hammer, stake spanner nut (N) to secure set screw (S).

Go on to Sheet 4.



TA236614

ASSEMBLE AND INSTALL TURBINE COVER (Sheet 4 of 6)

13. Remove input bevel drive gear wrench (K). Rotate input shaft (H) at least seven full revolutions to seat bearings.

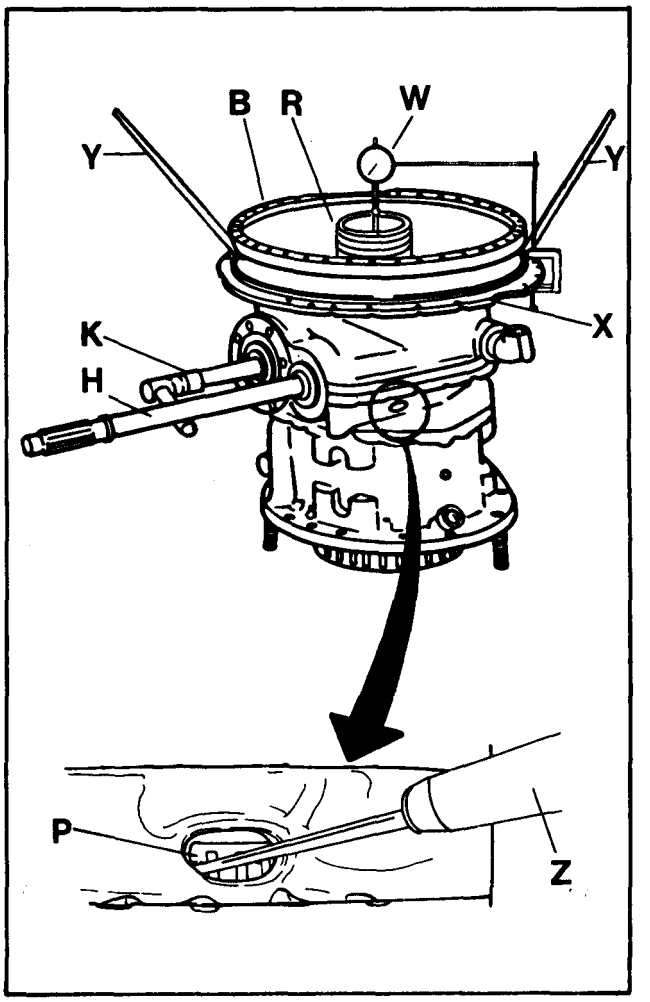
14. Mount base of dial indicator (W) onto flange of bevel gear housing (X). Locate dial indicator (W) on end of extension and zero indicator (W) against shaft (R).

15. Using two pry bars (Y), 180 degrees apart, pry up on turbine cover (B) and check reading on dial indicator (W). Reading on dial indicator (W) should be between 0.001-inch and 0.003-inch (0.03 and 0.08 mm).

16. If reading on dial indicator (W) is not within limits, use screwdriver (Z) to tighten bearing retainer nut (P) until end play is between 0.001 and 0.003 inch (0.03 and 0.08 mm).

17. Remove dial indicator (W) and extension. Remove bevel gear wrench (K). Install spanner wrench onto spanner nut on shaft (R). Measure and record torque required to rotate shaft (R) at this end play setting.

18. Rotate input shaft (H) at least seven full revolutions. Then, using screwdriver (Z), tighten bearing retainer nut (P) until torque required to rotate shaft (R) is 5 to 10 lb-in. (0.56 to 1.12 N.m) greater than value recorded in step 17. Remove shaft (H).

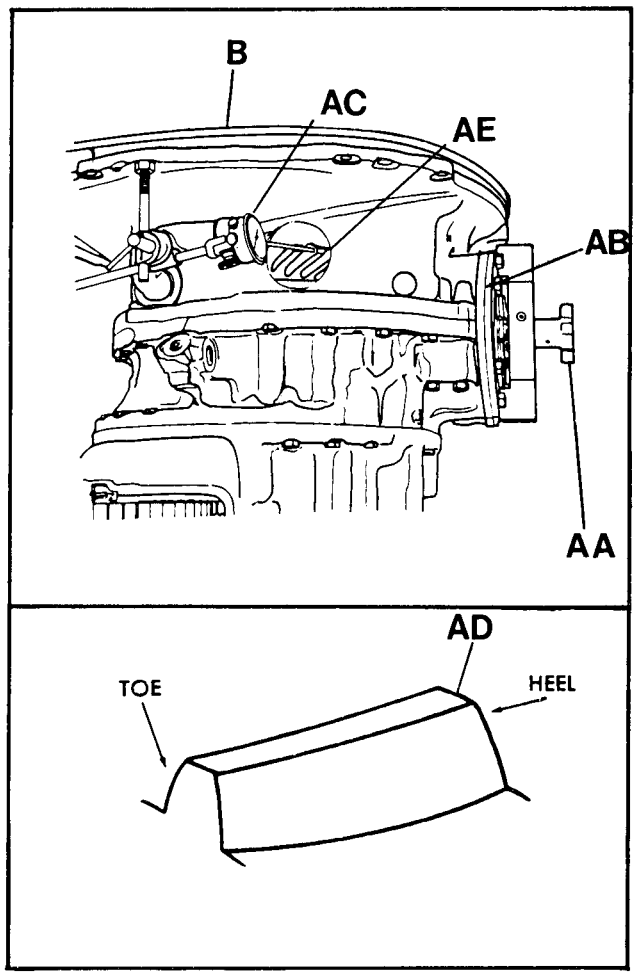


Go on to Sheet 5

TA236615

ASSEMBLE AND INSTALL TURBINE COVER (Sheet 5 of 6)

19. Install backlash setting fixture (AA) onto bearing retainer (AB). Install dial indicator (AC) and extension. Zero dial indicator against heel (AD) of one of the teeth on input driven bevel gear (AE). Rotating turbine cover (B) back and forth, check backlash reading on dial indicator. Backlash should be within 0.008 to 0.014 inch (0.12 to 0.36 mm).



NOTE

If the same matched set of bevel gears and the same shims are used, proper backlash and mesh pattern should be achieved. If a new set of gears and/or different shims are used, it may be necessary to change shim thickness to achieve proper adjustments. As a general rule, shim thickness under the input driven bevel gear carrier should be changed if proper backlash cannot be achieved; shim thickness under the input drive bevel gear carrier should be changed if proper mesh pattern cannot be achieved. However, remember that backlash and mesh pattern are simultaneously affected by any shim change. Repeated checks must be made to be sure that a desired setting of one is not lost while establishing the other. Backlash is always affected by any shim change. A 0.0025 inch (0.0635 mm) change under the drive bevel gear carrier, or a 0.0015 inch (0.0381 mm) change under the driven bevel gear carrier will change backlash approximately 0.0010 inch (0.025 mm).

Go on to Sheet 6

TA236616

ASSEMBLE AND INSTALL TURBINE COVER (Sheet 6 of 6)

20. Install bevel gear wrench (K). Install spanner wrench (AF), 3/4-to-1/2-inch adapter, and 1/2-inch drive breaker bar to spanner nut on shaft. Apply gear paint (item 31, appendix C) to four teeth of drive bevel gear (AE).

21. Place load on spanner wrench with one hand, and turn bevel gear wrench (K) with other hand. Check gear mesh pattern. (Depth of pattern is more important than location between toe (AG) and heel (AD) of tooth.)

NOTE

If shims are to be added or removed refer to pg 3-84.

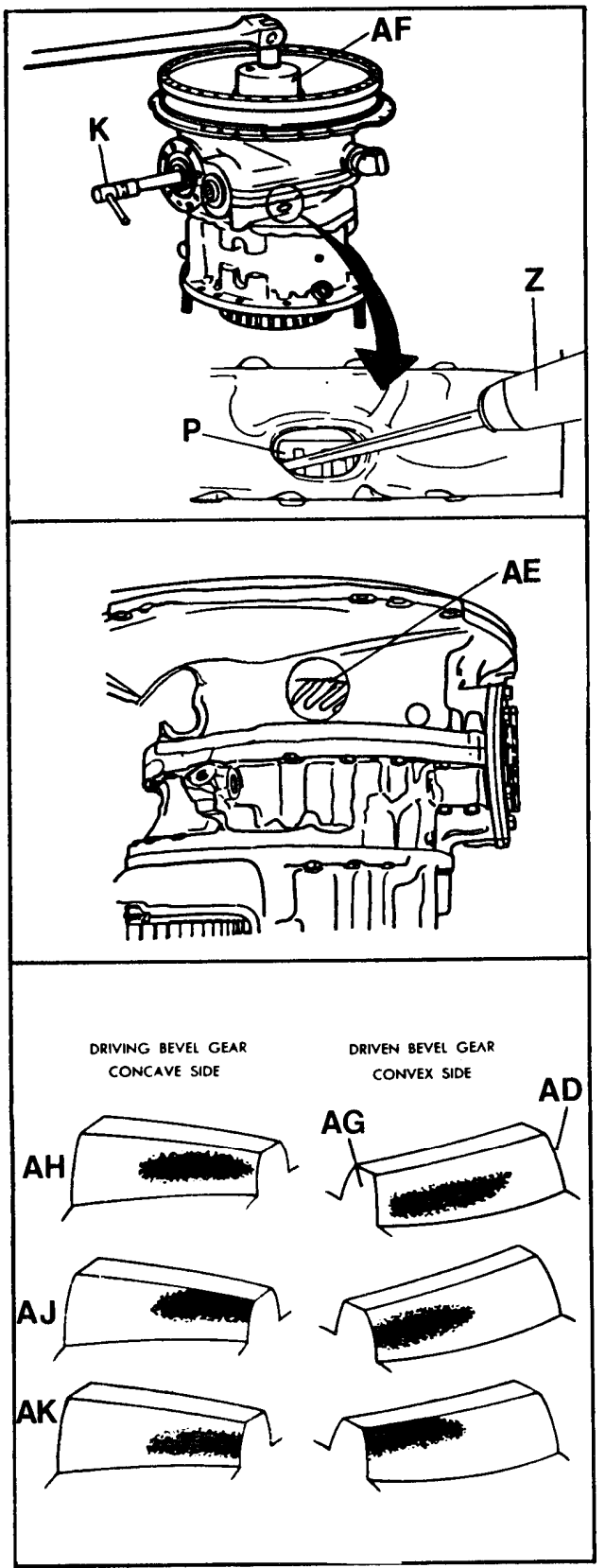
22. View (AH) is the desired pattern. If pattern looks like (AJ) on driving gear, add shims to move driving gear away from cone center. If pattern looks like (AJ) on driven gear, remove shims to move driven gear toward cone center.

23. If pattern looks like (AK) on driving gear, remove shims to move driving gear toward cone center. If pattern looks like (AK) on driven gear, add shims to move driven gear away from cone center.

24. Wipe gear paint from gears.

25. When all adjustments are completed, lock retainer nut (P) by using screwdriver (Z) to bend tab on lockplate into groove on nut (P).

END OF TASK



TA236617

INSTALL TORQUE TURBINE (CONVERTER TURBINE)

TOOLS: 5/8-in. 1/2-in. drive socket
1/2-in. drive torque wrench
1/2-in. drive breaker bar
1/2-in. drive 5-in. long extension
Plastic insert hammer

SPECIAL TOOLS: Spanner wrench, P/N 8390286

SUPPLIES: 7/1 6-20 x 3-in. guide bolt (two required)

PRELIMINARY PROCEDURE: Install Turbine Cover (Page 3-96)

1. Install two guide bolts (A) into bearing retainer.

2. Position turbine (B) in turbine cover (C). Be sure to aline bolt holes with holes in bearing retainer.

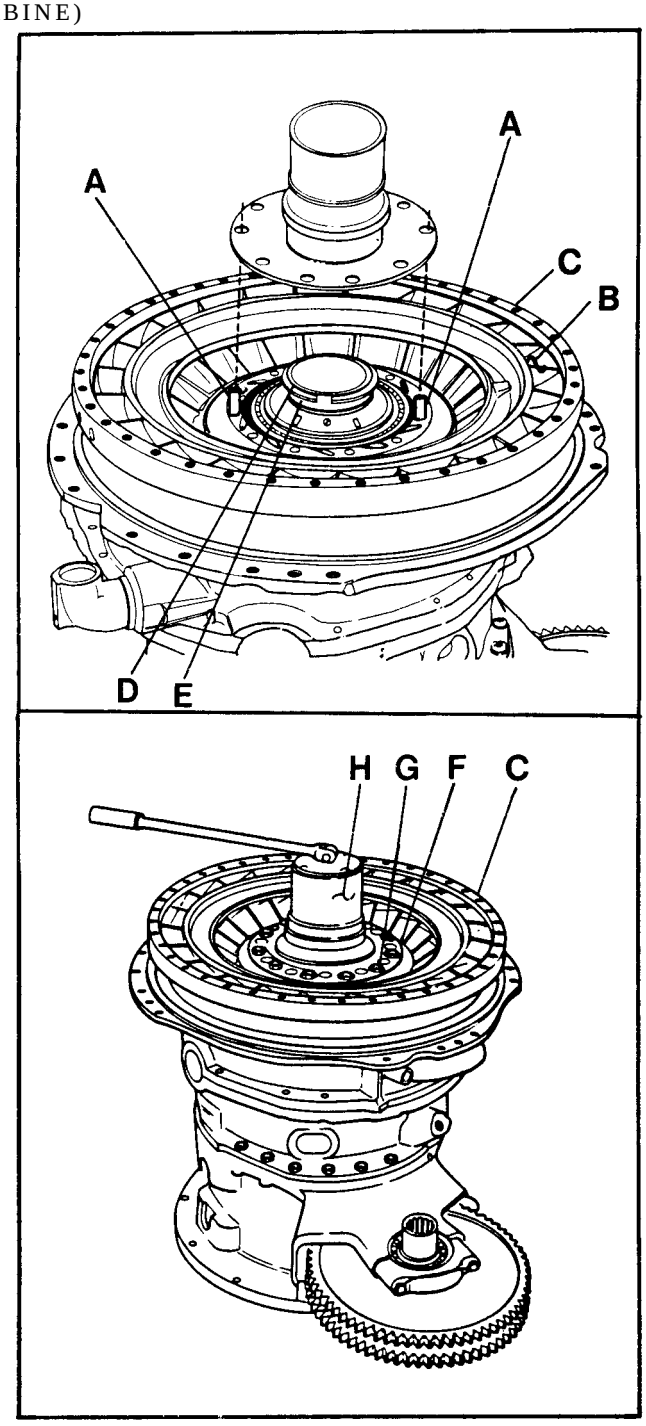
3. Oil seal ring (D) and install in groove on sleeve (E). Install sleeve (E) on turbine shaft.

4. Using hammer, install drive flange (F), alining bolt holes. Install nine bolts (G) through flange (F) and turbine (C) and thread into bearing retainer.

5. Remove guide bolts (A). Install remaining two bolts (G).

6. Using spanner wrench (H) and breaker bar to hold shaft and using socket, extension, and torque wrench to turn 11 bolts (G), alternately tighten to draw flange onto turbine shaft. Tighten 11 bolts (G) to 64 to 77 lb-ft (87 to 104 N.m).

END OF TASK



TA236618

ASSEMBLE CONVERTER PUMP

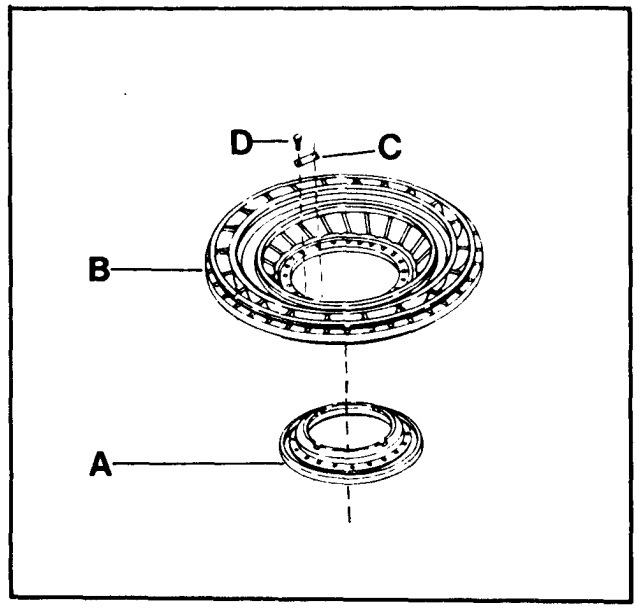
TOOLS: 7/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
1/2-in. drive 5-in. extension
Flat-tip screwdriver
Slip-joint pliers

PERSONNEL: Two persons required

PRELIMINARY PROCEDURE: Install Torque Turbine (Page 3-102)

1. Position hub (A) on clean work surface.
2. Position pump (B) on hub (A).
3. Install 12 plates (C) and 24 bolts (D).
4. Using socket extension and torque wrench, tighten 24 bolts (D) to 10 to 12 lb-ft (14 to 16 N.m).
5. Using screwdriver, lift corners of plates (C). Using pliers, bend a corner of plates (C) up against each bolt head (D).

END OF TASK



TA236619

ASSEMBLE STATORS (Sheet 1 of 2)

TOOLS: Flat-tip screwdriver
Machinist's hammer
Punch
1/2-in. drive torque wrench
5/32-in. 3/8-in. drive hex head socket
3/8-to-1/2-in. adapter

PRELIMINARY PROCEDURE: Assemble Converter Pump (Page 3-103)

NOTE

First stator (A) and second stator (B) consist of the same kind and number of parts except, second stator thrust washer bearing (C) has six radial grooves in one side. The following procedure covers the assembly of one stator. Do steps 1 thru 4 only if stators were disassembled. Otherwise, go to step 5.

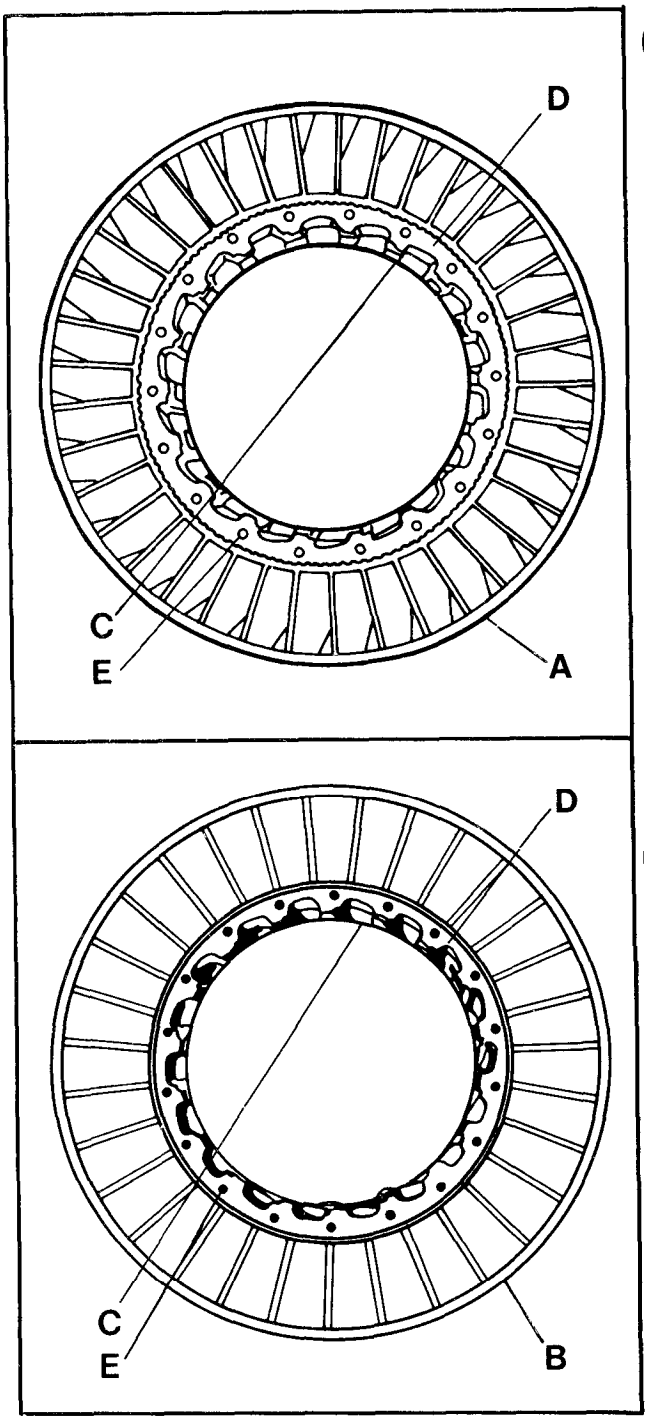
1. Place thrust washer bearing (C) and cam (D) in stator (A or B). The grooves in thrust washer bearing (C) in stator (B) must be toward cam (D). Index cam so that marked spline tooth on stator is between two marked spline teeth on cam.

2. Insert 18 screws (E) through stator (A or B) and thrust washer bearing (C) and thread them into cam (D).

3. Using socket, adapter, and torque wrench, tighten 18 screws (E) to 10 to 12 lb-ft (14 to 16 N·m).

4. Support screw heads and using hammer and punch, flare the end of 18 screws (E) so that they essentially fill the counter bores in the cam.

Go on to Sheet 2.



TA236620

ASSEMBLE STATORS (Sheet 2 of 2)

5. Install 18 torsional helical springs (F) into second stator (B) as shown. Place second stator (B) on roller race (G) so that race (G) flange seats on thrust washer bearing. Using flat-tip screwdriver, install bearing rollers (H), as shown. Springs (F) and rollers (H) are installed correctly if springs (F) hold rollers (H) against race (G).

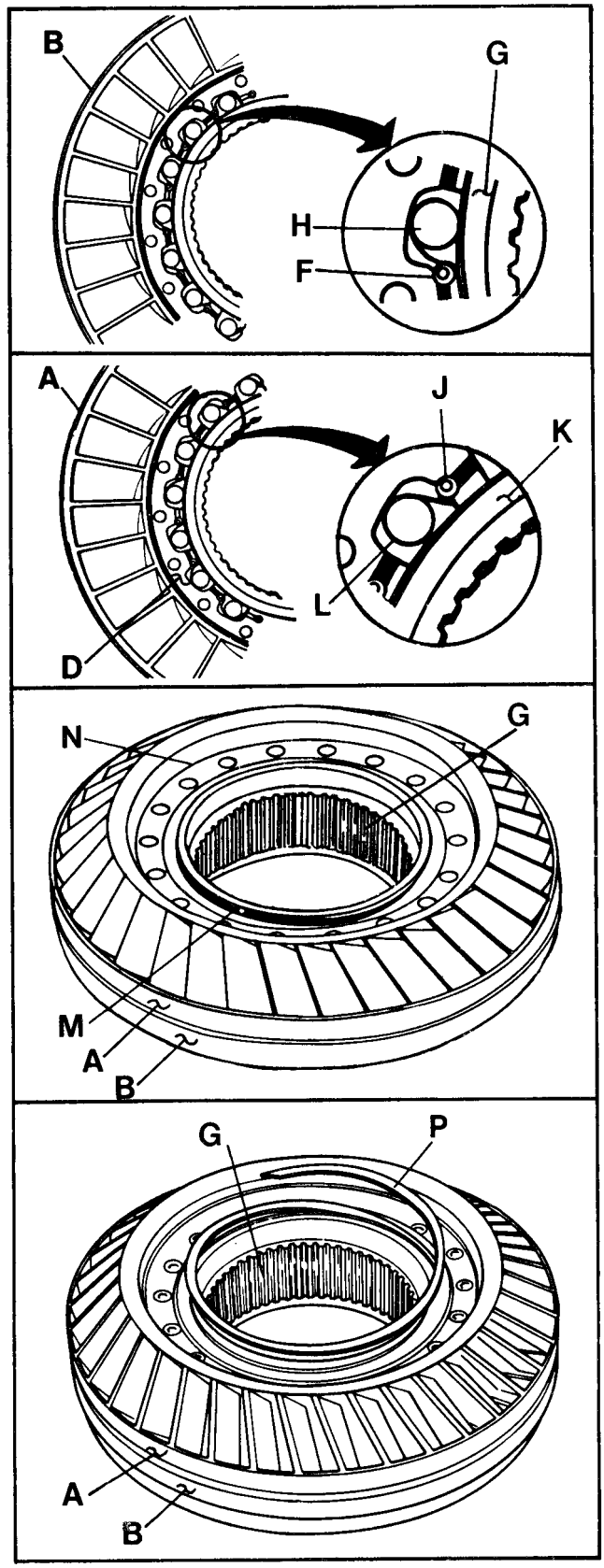
6. Install 18 torsional helical springs (J) into first stator (A) as shown. Place first stator (A) on a spare roller race or tube (K) so that it seats on thrust washer bearing. Using flat-tip screwdriver, install bearing rollers (L), as shown. Springs (J) and rollers (L) are installed correctly if springs (J) hold rollers (L) against spare race or tube (K).

7. Using enough petrolatum (item 13, Appendix C) to hold parts in place, place spacer and washer onto cam (D) of first stator (A). Being careful to hold all parts together, invert assembled first stator (A). Aline spare race wheel or tube (K) with roller race wheel (G) and slide first stator (A) onto race wheel (G), thereby displacing spare race wheel or tube (K). Check to be sure all springs (F) and (J) and rollers (H) and (L) are still in proper place after transfer.

8. Place small amount of petrolatum (item 13, Appendix C) in detent (M) of freewheel roller race wheel (G). Place ball into detent (M) in race wheel (G). Install roller retainer (N), grooved side downward, onto race wheel (G).

9. Using screwdriver, install spiral retaining ring (P) into groove of race wheel (G).

END OF TASK



TA236621

ASSEMBLE TORQUE CONVERTER HOUSING (Sheet 1 of 2)

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
Screwdriver bit
External retaining ring pliers
Center punch
Punch
Arbor press
Straight
Machinist's hammer
Plastic insert hammer
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting Sling
P/N 7083778

PRELIMINARY PROCEDURE: Assemble Stators (Page 3-104)

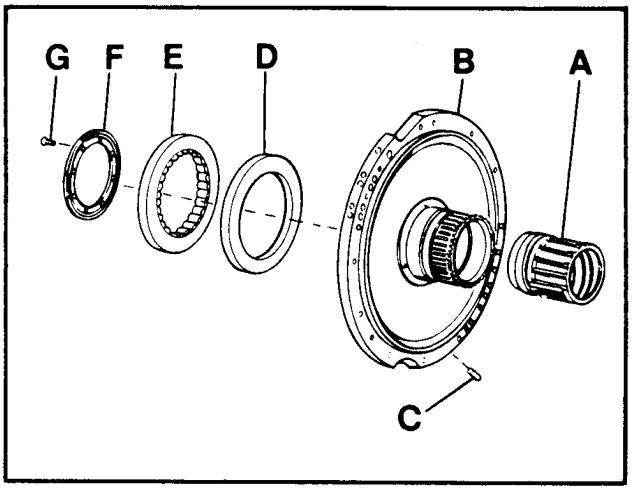
NOTE

If bushing was not removed from reaction plate, omit step 1.

1. Using arbor press, press bushing (A) into reaction plate (B). Using punch and hammer, install pin (C).

NOTE

Inner race (D) of bearing and outer race (E) of bearing are mated. If one is replaced, both must be replaced.



2. Using arbor press, press inner race (D) of bearing, serial number upward onto reaction plate (B).

3. Install outer race (E) of bearing. Install retaining plate (F), flat side upward. Install eight screws (G). Using screwdriver bit and torque wrench, tighten eight screws (G) to 14 to 18 lb-ft (19 to 24 N.m). Using center punch and hammer, stake metal of retainer (F) into slots of eight screws (G).

Go on to Sheet 2.

TA236622

ASSEMBLE TORQUE CONVERTER HOUSING (Sheet 2 of 2)

4. Turn reaction plate (B) over and using hammer and straight, press bearing inner race and rollers (H) onto hub of reaction plate (B).

5. Using hoist and sling, set assembled reaction plate (B) on converter housing (J). Install 14 bolts (K). Using socket and torque wrench, tighten 14 bolts (K) to 36 to 43 lb-ft (49 to 58 N.m).

6. Using hoist and sling, invert assembly.

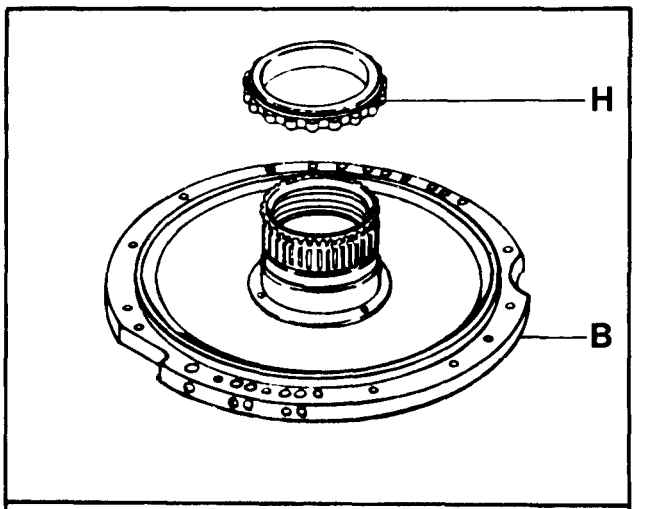
7. Install metal seal ring (L) on oil seal ring (M). Place converter pump (N) on work table, flange downward. Install oil seal ring (M) into converter pump (N), tangs toward pump.

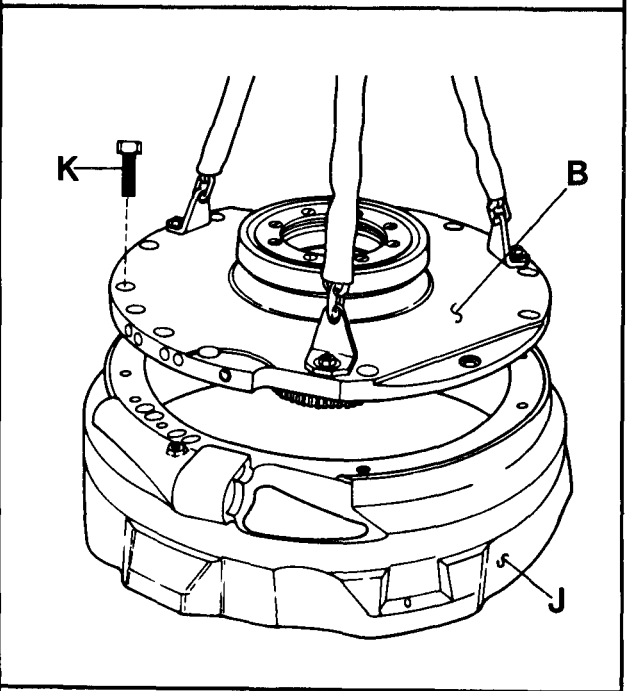
8. Install the assembled converter pump (N) into the housing (J). Install the assembled first and second stators (P), retaining ring side upward, onto the converter pump (N).

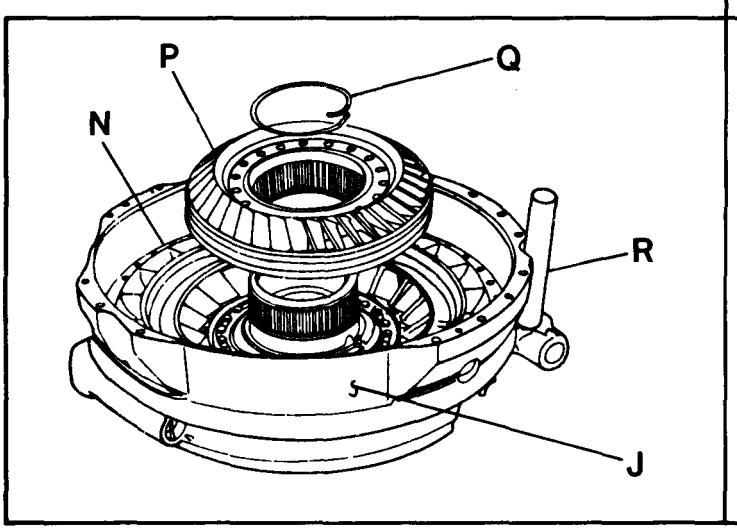
9. Using retaining ring pliers, install retaining ring (Q) in groove on hub of reaction plate (B).

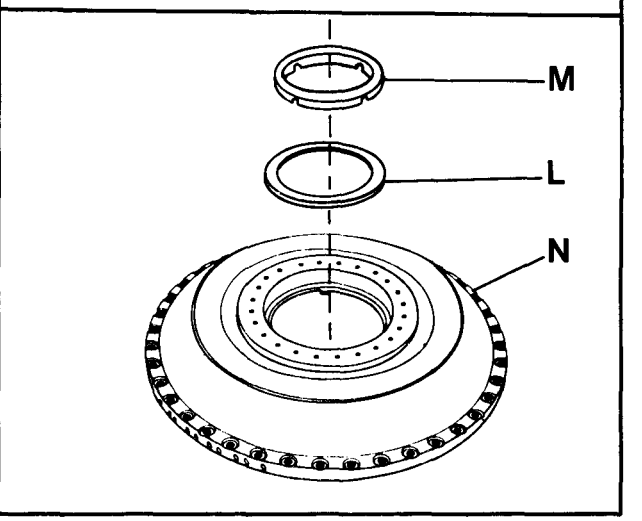
10. Using plastic insert hammer, install oil transmission neck assembly (R) into housing (J).

END OF TASK









TA236622

INSTALL TORQUE CONVERTER HOUSING

TOOLS: 9/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
Universal joint
Hoist, 2-ton minimum capacity
Plastic insert hammer
1/2-in. drive 5-in. long extension

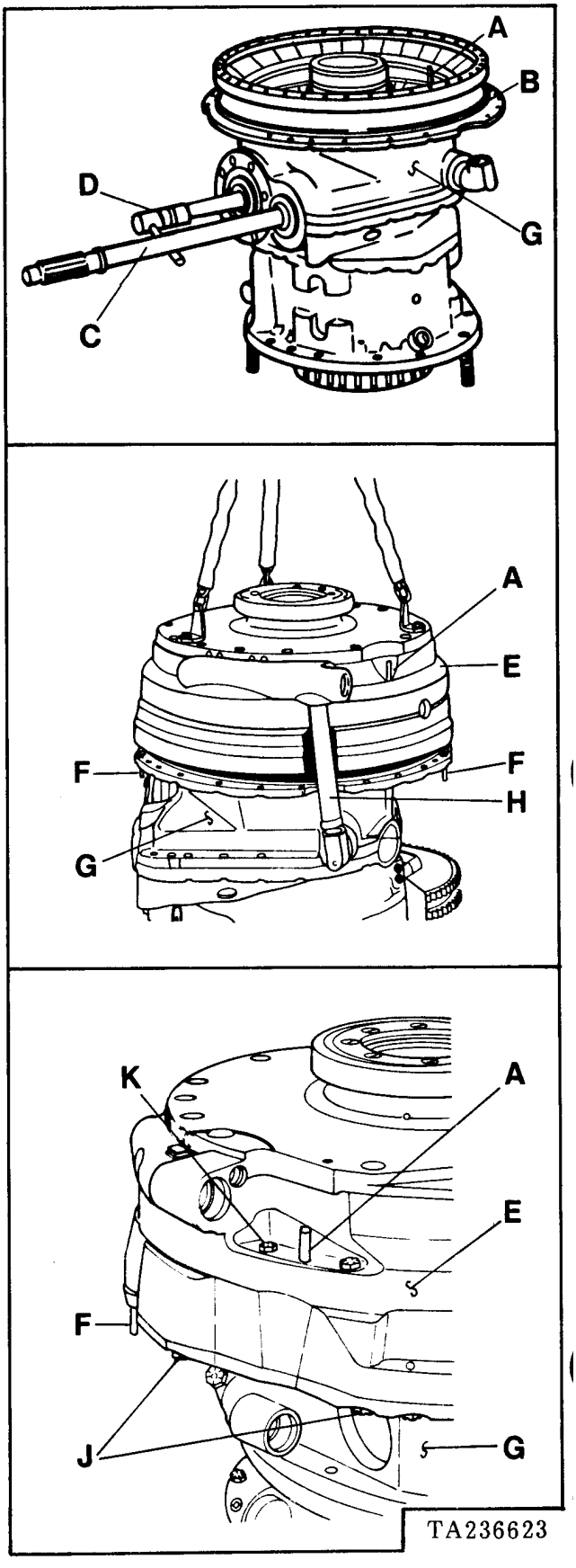
SPECIAL TOOLS: Lifting sling, P/N 7083778
Pinion turning wrench P/N 7081564

SUPPLIES: 3/8-24 x 3-in. long guide bolt
3/8-16 x 3-in. long guide bolt (two required)

PRELIMINARY PROCEDURE: Assemble Torque Converter Housing (Page 3-106)

1. Install one 3/8-24 x 3-inch guide bolt (A) into turbine cover (B). Install shaft (C) and pinion turning wrench (D) as shown.
2. Using hoist and sling, invert converter housing assembly (E).
3. Install two 3/8-16 x 3-inch guide bolts (F) into converter housing assembly (E). Position converter housing assembly (E) over bevel gear housing (G). Lower converter housing assembly (E) onto housing (G), alining neck assembly (H), guide bolt (A), and guide bolts (F). Tap housing (E) with plastic insert hammer to properly seat neck (H).
4. Install 14 bolts (J). Remove guide bolts (F). Install remaining two bolts (J). Using socket, universal joint, and torque wrench, alternately tighten 16 bolts (J). Torque 16 bolts (J) to 36 to 43 lb-ft (49 to 58 N.m).
5. Working through access hole in converter housing (E), install one bolt (K). Remove guide bolt (A). Install remaining 39 bolts (K). Using socket, extension, and torque wrench, tighten 40 bolts (K) to 41 to 49 lb-ft (56 to 66 N.m).
6. Remove shaft (C) and wrench (D).

END OF TASK



Section VI. CONTROL VALVE ASSEMBLY

3-19 OVERVIEW

It is not the intention of this section to authorize total repair of the control valve assembly. The instructions presented here are intended for partial and minor repairs only. Disassemble only to the extent necessary to accomplish the minor repair. If extensive repair is needed, the assembly must be sent to depot for repair.

CAUTION

The control valve assembly and its associated parts must be kept clean during all repair operations.

DISASSEMBLY (Sheet 1 of 6)

TOOLS: 7/8-in. 1/2-in. drive socket
9/16-in. 1/2-in. drive socket
7/16-in. 1/2-in. drive socket
1-5/16-in. 3/4-in. drive socket
1/2-in. drive breaker bar
3/4-in. drive breaker bar
Diagonal pliers
External retaining ring pliers
Flat-tip screwdriver
9/16-in. open end wrench
3/16-in. socket head screw key

PRELIMINARY PROCEDURE: Remove Control Valve Assembly (Page 2-29)

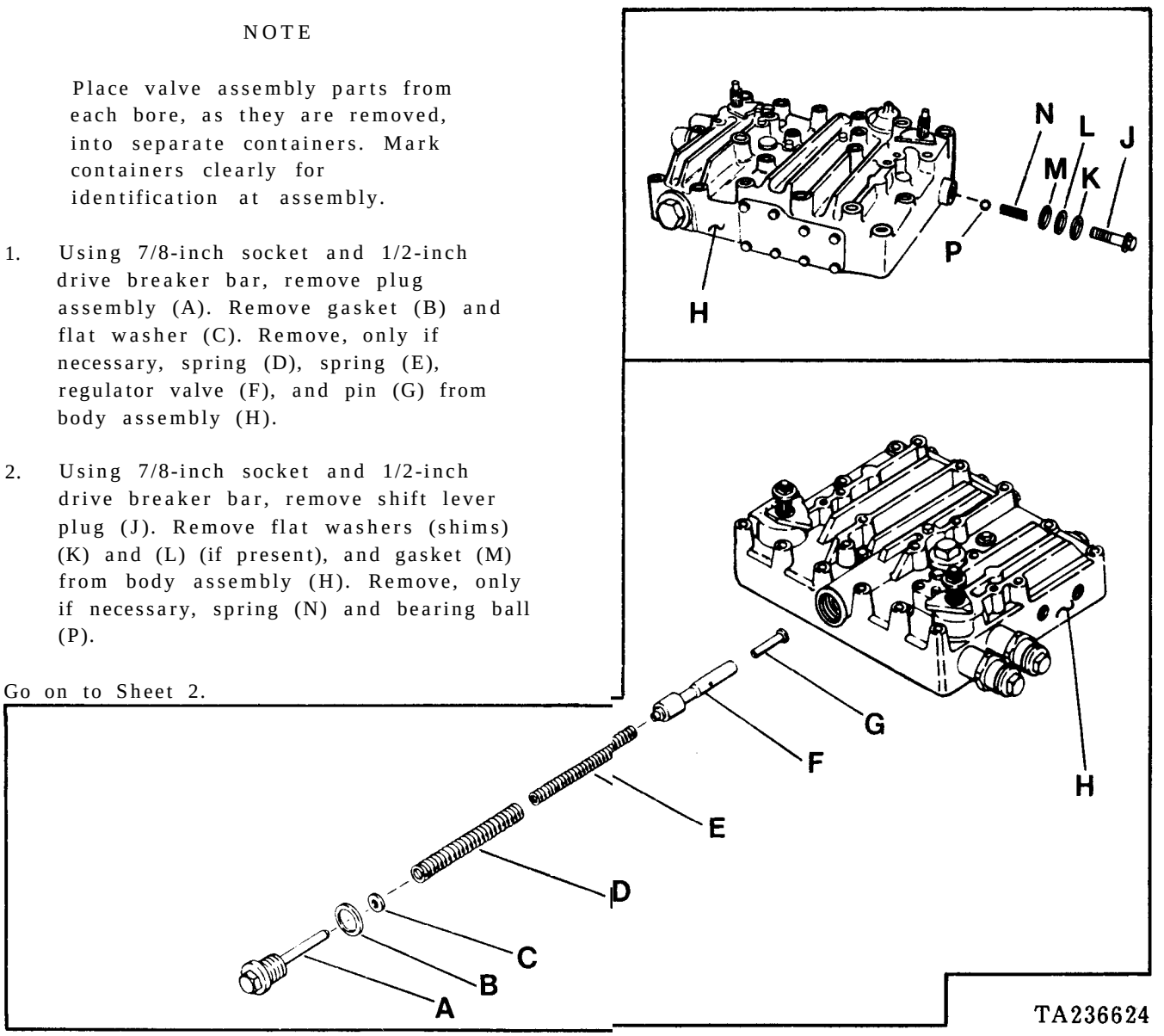
NOTE

Place valve assembly parts from each bore, as they are removed, into separate containers. Mark containers clearly for identification at assembly.

1. Using 7/8-inch socket and 1/2-inch drive breaker bar, remove plug assembly (A). Remove gasket (B) and flat washer (C). Remove, only if necessary, spring (D), spring (E), regulator valve (F), and pin (G) from body assembly (H).

2. Using 7/8-inch socket and 1/2-inch drive breaker bar, remove shift lever plug (J). Remove flat washers (shims) (K) and (L) (if present), and gasket (M) from body assembly (H). Remove, only if necessary, spring (N) and bearing ball (P).

Go on to Sheet 2.



DISASSEMBLY (Sheet 2 of 6)

3. Using diagonal pliers, remove cotter pin (Q) from shift lever assembly (R).

4. Using 9/16-inch socket and 1/2-inch drive breaker bar, remove nut (S). Remove flat washer (T) from shift lever assembly (R).

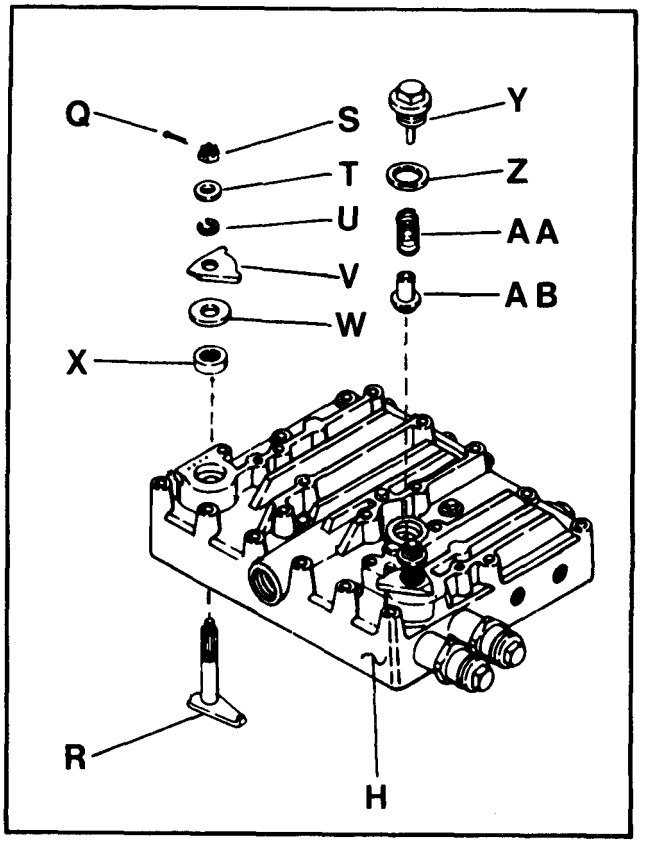
5. Using external retaining ring pliers, remove retaining ring (U) from shift lever assembly (R). Remove dial pointer (V) and thrust washer bearing (W).

6. Using screwdriver, remove oil seal (X) from body assembly (H) only if replacement is necessary (removal will destroy the seal).

7. Remove shift lever assembly (R).

8. Using 7/8-inch socket and 1/2-inch drive breaker bar, remove plug assembly (Y). Remove gasket (Z). Remove, only if necessary, spring (AA) and valve (AB) from body assembly (H).

Go on to Sheet 3.



TA236625

DISASSEMBLY (Sheet 3 of 6)

9. Using 7/16-inch socket and 1/2-inch drive breaker bar, remove six of the eight cap screws (AC) and lock washers (AD) from body assembly (H), leaving two screws and washers near center of access cover (AE).

NOTE

The cover is spring loaded. To release the cover, evenly remove the two remaining screws and washers.

10. Remove access cover (AE) and gasket (AF). Remove, only if necessary, transmission valve (AG), spring (AH), flat washer (AJ), bearing ball (AK), lubricating valve (AL), and spring (AM).

11. Using 1-15/16-inch socket and 3/4-inch drive breaker bar, remove plug (AN) from valve body (H). Remove ring spacer (AP). Remove, only if necessary, pin (AQ), flat washer (AR), spring (AS), and valve (AT).

12. Using 7/8-inch socket and 1/2-inch drive breaker bar, remove plug (AU). Remove flat washer (AV). Remove, only if necessary, spring (AW) and steering detent (AX) from body assembly (H).

13. Using diagonal pliers, remove cotter pin (AY) from shaft (AZ).

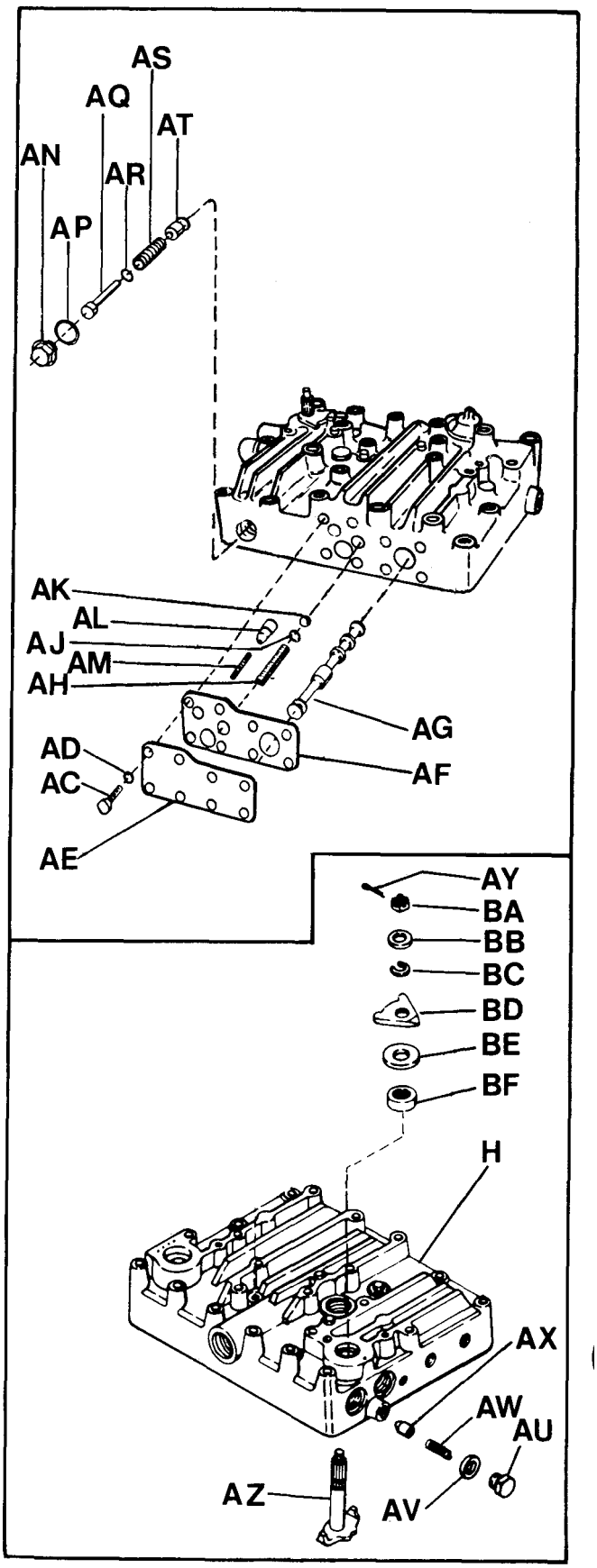
14. Using 9/16-inch socket and 1/2-inch drive breaker bar, remove nut (BA). Remove flat washer (BB).

15. Using external retaining ring pliers, remove retaining ring (BC). Remove dial pointer (BD) and thrust washer bearing (BE) from shaft (AZ).

16. Using screwdriver, remove oil seal (BF) from body assembly (H) only if replacement is necessary (removal will destroy the seal).

17. Remove shaft (AZ) from body assembly (H).

Go on to Sheet 4.



TA236626

DISASSEMBLY (Sheet 5 of 6)

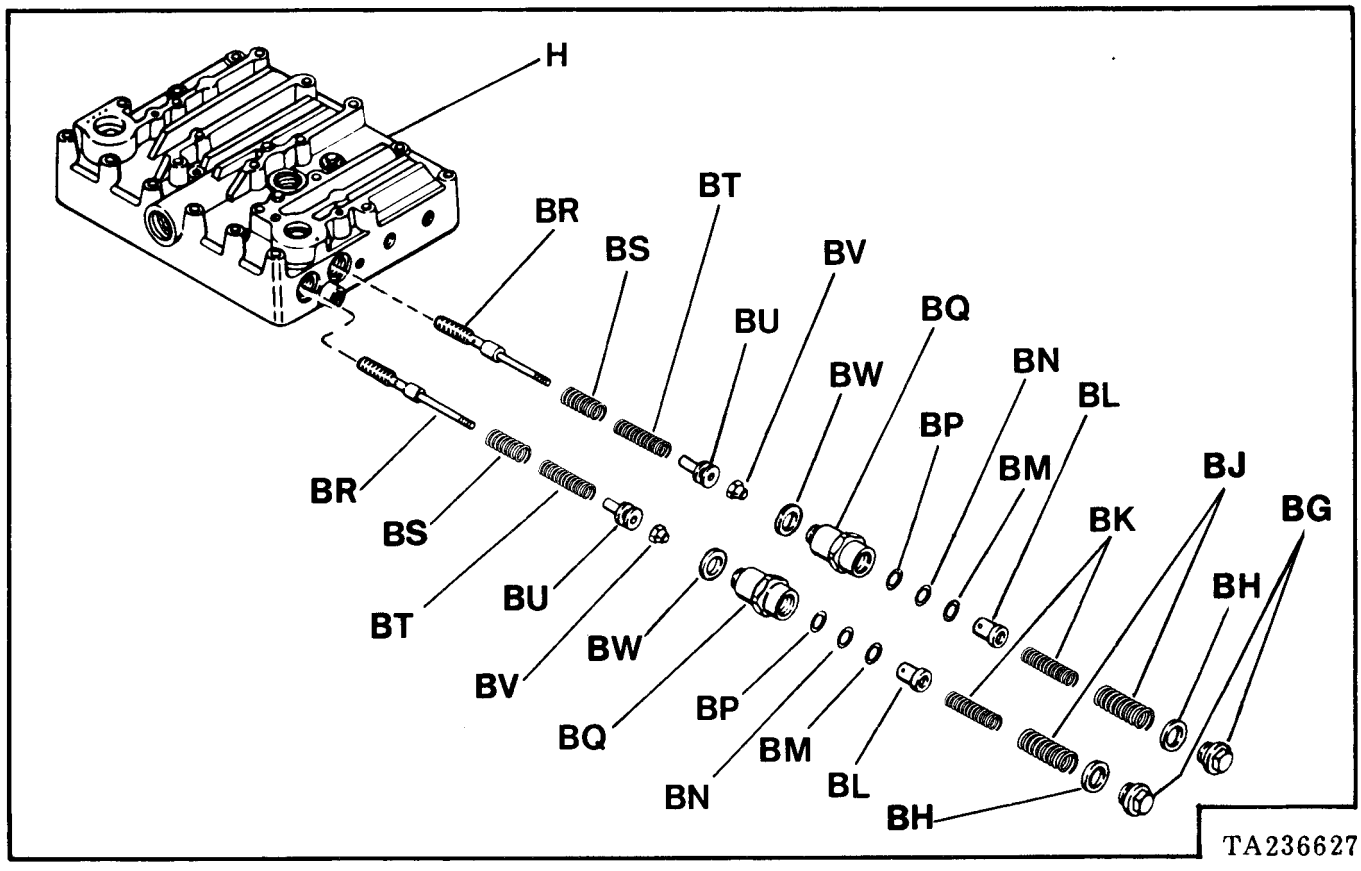
18. Using 7/8-inch socket and 1/2-inch drive breaker bar, remove plugs (BG). Remove two gaskets (BH). Remove, only if necessary, two springs (BJ), two springs (BK), two detent plungers (BL), ring spacers (BM), ring spacers (BN), and ring spacers (BP) from transmission housings (BQ).

19. Using 1-5/16-inch socket and 3/4-inch drive breaker bar, remove two housings (BQ) from body assembly (H).

20. Remove as an assembly two valves (BR), two springs (BS), two springs (BT), two steering retainers (BU), two sleeve nuts (BV), and two ring spacers (BW).

21. Using 7/16-inch socket and 1/2-inch drive breaker bar, remove and throw away sleeve nuts (BV) and separate the remaining parts.

Go on to Sheet 6.



DISASSEMBLY (Sheet 6 of 6)

NOTE

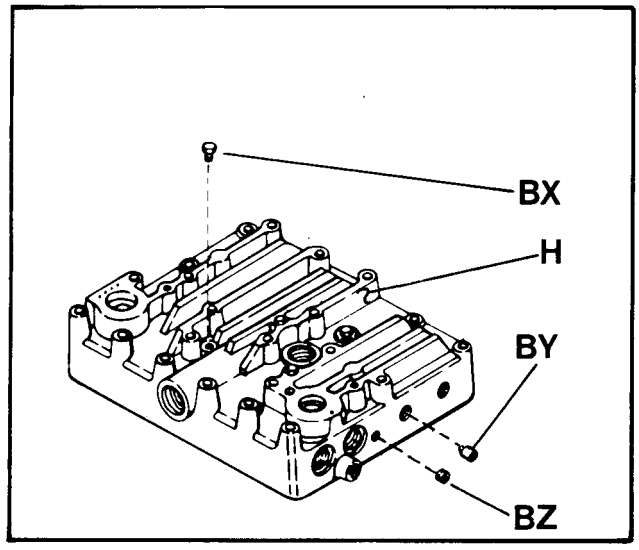
Remove pipe plugs (BX), (BY), and (BZ) only if necessary for cleaning or replacement.

22. Using 9/16-inch open end wrench, remove plug (BY) from body assembly (H).

23. Using 3/16-inch socket head screw key, remove plug (BZ) from body assembly (H).

24. Using 7/16-inch socket and 1/2-inch drive breaker bar, remove five plugs (BX) from body assembly (H).

END OF TASK



TA251570

3-20 CLEANING

Clean all control valve assembly parts, as necessary, in accordance with pages 2-17 and 2-18.

3-21 INSPECTION AND REPAIR

a. Refer to page 2-19 for general inspection and repair recommendations.

b. Refer to repair standards table on page 3-116 for wear limits information. Tools required to measure repair standards are inside and outside micrometers and a spring tester.

Repair Standards (Valve Body Assembly)

Fig. B-2 ref. Item	Point of measurement	Wear Limits D.S. & G.S. Maint.
13	Load at 1.438 in. height	0.96 lb
15	OD of valve lands	1.1215
56	ID of bore in valve body	1.1260
15,56	Fit of valve in bore	0.0045L
20	Load at 2.688 in. height	48 lb
24	Load at 1.437 in. height	18.3 lb
26	Load at 4.62 in. height	64.5 lb
25	OD of valve lands	1.1220
56	ID of bore in valve body	1.1265
25,56	Fit of valve in bore	0.0045L
44	OD of valve lands	0.6220
54	ID of sleeves in valve body 56	0.6258
44,54	Fit of valves in sleeves	0.0048L
42	Load at 0.650 in. height	12.6 lb
34	Load at 2.06 in. height	14.5 lb
33	Load at 1.16 in. height	28.2 lb
49	Load at 0.656 in. height	10.45 lb
51	OD of shaft	0.6225
56	ID of bore in valve body 56	0.6275
51,56	Fit of shaft in bore	0.0050L
56	Valve seal wall thickness	0.09
65	OD of shaft	0.6225
56	ID of bore in valve body 56	0.6275
65,56	Fit of shaft in bore	0.0050L
63	OD of valve smaller land	0.7470
56	ID of bore (rearward end)	0.7515
63,56	Fit of valve in bore	0.0045L
63	OD of valve larger land	1.1220
56	ID of bore (forward end)	1.1265
63,56	Fit of valve in bore	0.0045L
66	Load at 4.187 in. height	15.3 lb
67	Load at 4.312 in. height	80 lb
61	Load at 1.312 in. height	47.5 lb

ASSEMBLY (Sheet 1 of 8)

TOOLS: 7/8-in. 1/2-in. drive socket
7/16-in. 1/2-in. drive socket
1-5/16-in. 3/4-in. drive socket
9/16-in. 3/8-in. drive socket
1/2-in. drive breaker bar
1/2-in. drive torque wrench
3/8-in. drive torque wrench
3/4-in. female to 1/2-in. male adapter
9/16-in. open end wrench
3/16-in. socket head screw key
Arbor press
Machinist's hammer
Cold chisel
Thickness gage

PRELIMINARY PROCEDURE: Cleaning and Inspection (Page 3-115)

1. If five pipe plugs (A) were removed from body assembly (B), use a 7/16-inch socket and breaker bar to install them. Tighten plugs enough to prevent leakage.

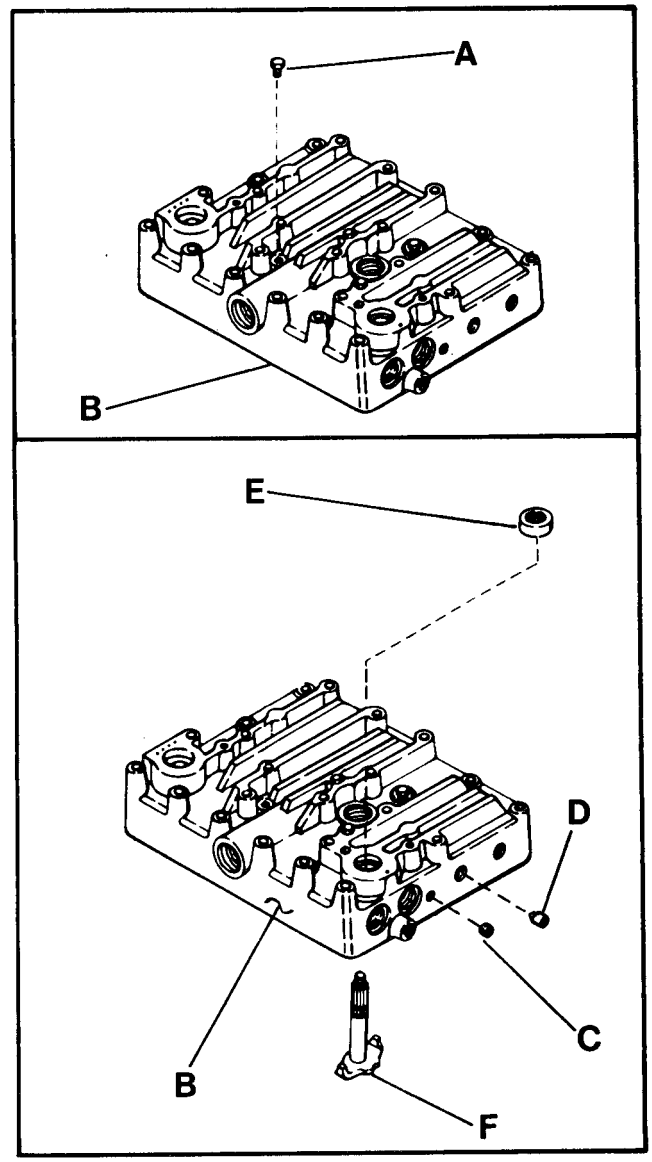
2. If pipe plug (C) was removed from body assembly (B), install it, using 3/16-inch socket head screw key. Tighten plug enough to prevent leakage.

3. If pipe plug (D) was removed from body assembly (B), install it, using 9/16-inch open end wrench. Tighten plug enough to prevent leakage.

4. If oil seal (E) was removed, install new seal, spring side first, into spring shaft boss of body assembly (B). Using arbor press, press seal to bottom of bore. Lubricate seal lip with high-temperature grease (item 14, Appendix C).

5. Install shaft (F) carefully to avoid damaging oil seal (E).

Go on to Sheet 2.



TA251571

ASSEMBLY (Sheet 2 of 8)

6. Assemble two springs (G,H) onto each of two valves (J).

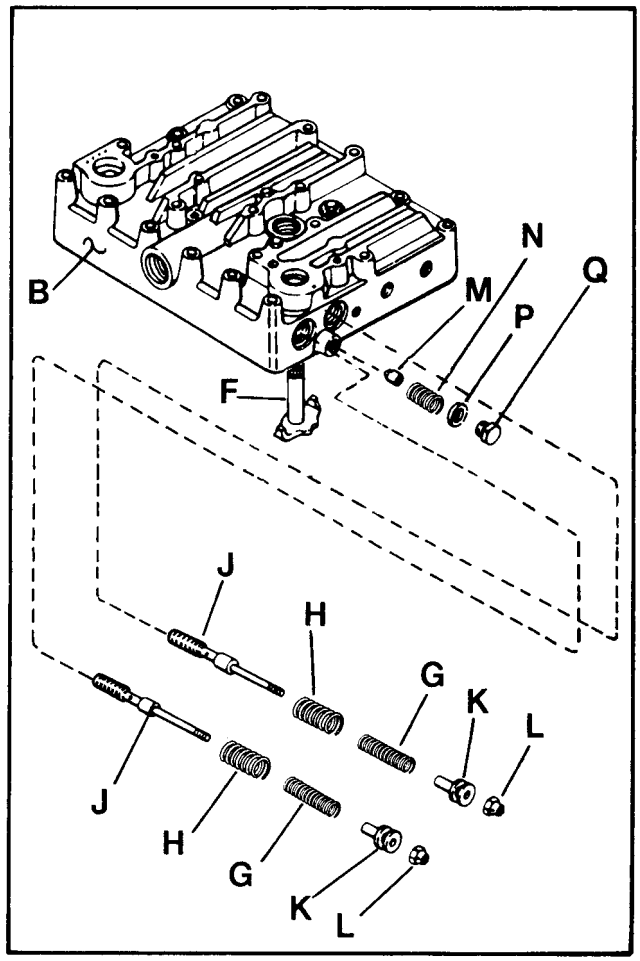
7. Assemble two steering retainers (K) against the springs and, using 7/16-inch socket and handle, secure them with two sleeve nuts (L).

8. Pull shaft (F) out far enough from body assembly (B) so that both assembled steer valves (per steps 6 and 7) can be installed in their bores in body assembly (B).

9. Check that grooves of steering retainers (K) engage the tangs of shaft (F).

10. Install steering detent (M), spring (N), flat washer (P), and plug (Q).

Go on to Sheet 3.



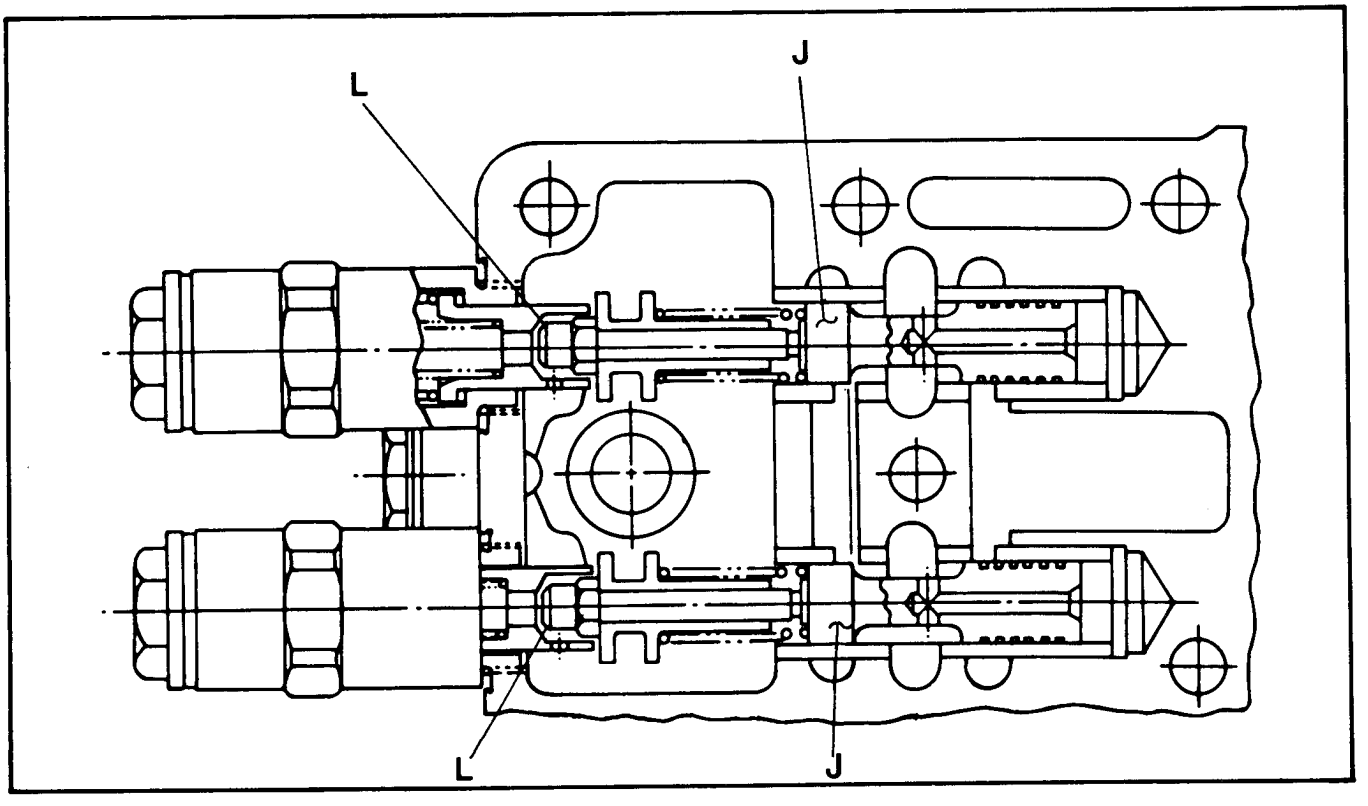
TA251572

ASSEMBLY (Sheet 3 of 8)

11. Check that sleeve nuts (L) are seated on valves (J) so that a 0.025 to 0.035-inch (0.064 to 0.89 cm) gap exists between right edge of small land on valve and edge of bore.

12. Using thickness gage, take measurement of step 11 when steer valve lever is in neutral detent and steer valves (J) are pushed toward sleeve nuts (L) to remove any backlash.

Go on to Sheet 4.



TA251573

ASSEMBLY (Sheet 4 of 8)

NOTE

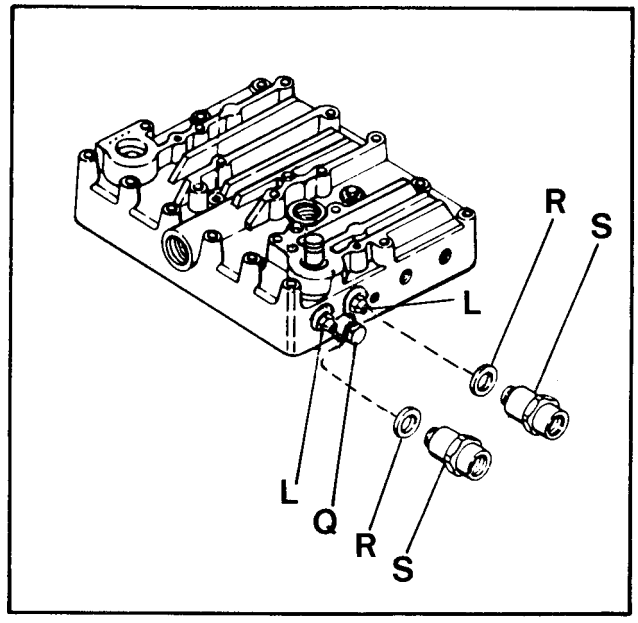
Do step 13 only after measurements and adjustments of steps 11 and 12 are all done.

13. Using hammer and chisel, stake sleeve nuts (L) against flats on valve stem.

14. Using 7/8-inch socket and torque wrench, torque plug (Q) to 40-50 lb-ft (54-68 N.m).

15. Install two ring spacers (R) and two housings (S). Using 1-5/16-inch socket, 3/4-inch female to 1/2-inch male adapter, and torque wrench, torque two housings (S) to 40-50 lb-ft (54-68 N.m).

Go on to Sheet 5.



TA251574

ASSEMBLY (Sheet 5 of 8)

16. Place one of each ring spacers (T,U, and V) on each detent plunger (W). Insert these assembled parts into the bore of each housing (S).

17. Install inner spring (X) into the recess of plunger (W) (two places) and install outer springs (Y) over inner springs (X).

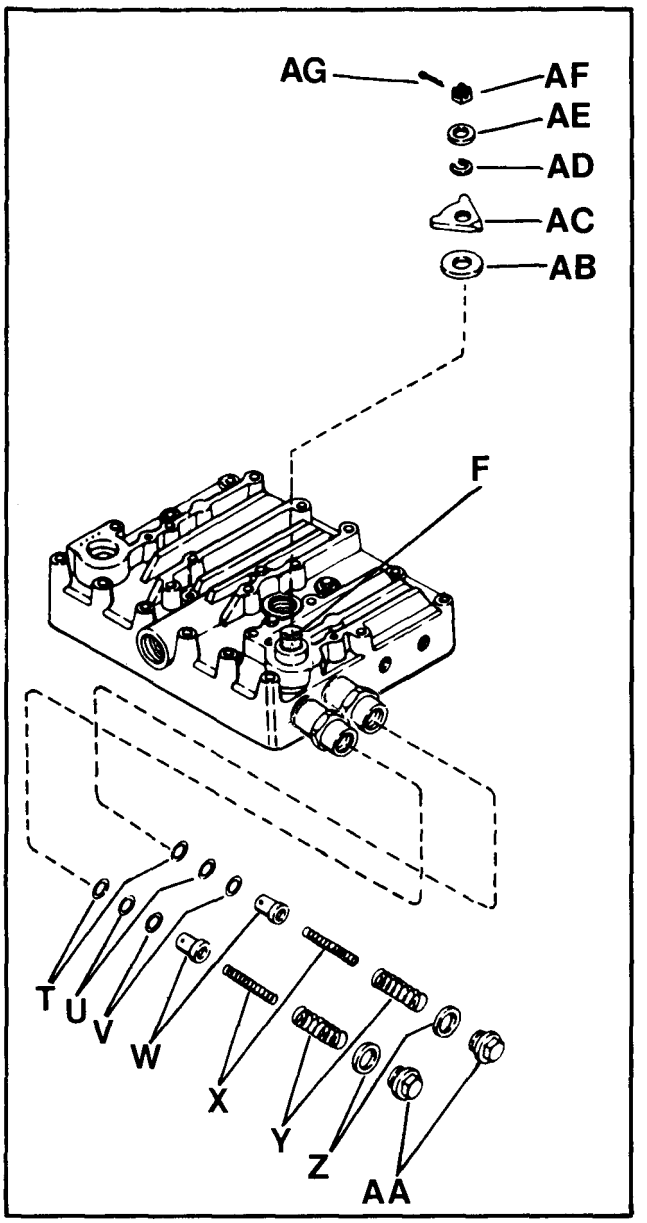
18. Install gaskets (Z) and plugs (AA). Tighten plugs finger tight.

19. Using thickness gage, measure gap between plungers (W) and steering retainers (K). Each gap should be 0.006 to 0.016 inch (0.015 to 0.041 N.m) as shown in the figure on page 3-123). If not within limits, select and install ring spacers (V, U, and T) of such thickness that you get correct clearance.

20. Using 7/8-inch socket and torque wrench, tighten two plugs (AA) to (40-50 lb-ft 54-68 N.m).

21. Hold up on shaft (F), to prevent disengagement of parts, and install thrust washer bearing (AB), dial pointer (AC), retaining ring (AD), flat washer (AE), and nut (AF) onto shaft (F). Secure nut (AF) with cotter pin (AG).

Go on to Sheet 6.



TA251575

ASSEMBLY (Sheet 6 of 8)

22. Install valve (AH), spring (AJ), pin (AK), ring spacer (AL), and plug (AM) into body assembly (B).

NOTE

The amount (if any) of adjustment washers (AN) will be determined by tests in Chapter 4.

23. Using 1-5/16-inch, 3/4-inch female to 1/2-inch male adapter, and 1/2-inch drive torque wrench, tighten plug (AM) to 90-100 lb-ft (122-136 N.m).

24. Install lubricating valve (AP) and spring (AQ) into body assembly (B).

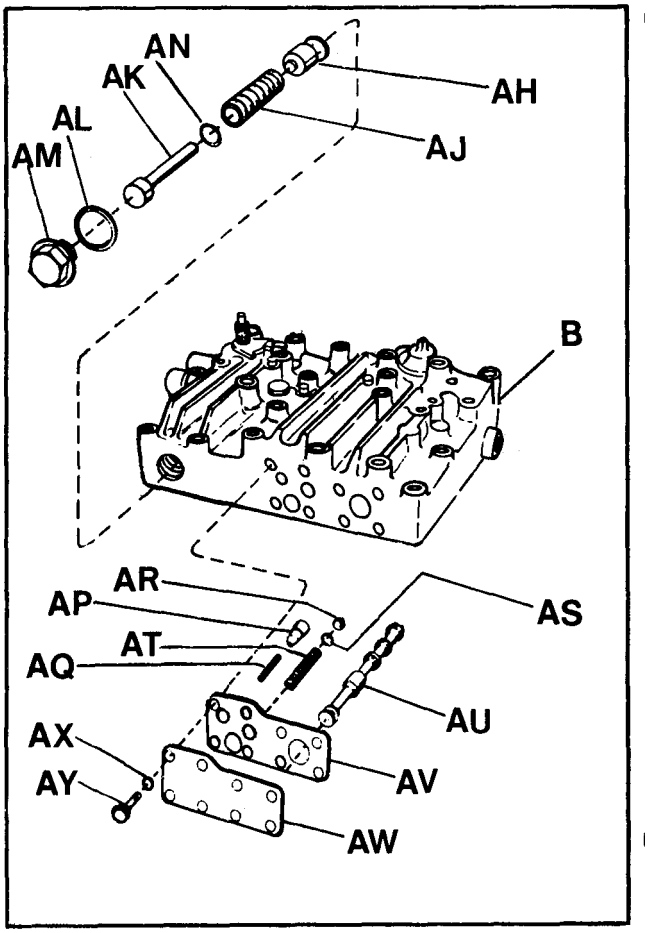
25. Install bearing ball (AR), washer (AS), and spring (AT) into body assembly (B).

26. Install valve (AU) into body assembly (B).

27. Place gasket (AV) and access cover (AW) onto body assembly (B).

28. Using 7/16-inch socket and torque wrench, install eight lock washers (AX) and cap screws (AY) into body assembly (B). Draw access cover (AW) down evenly to prevent bending the protruding valve springs (AQ, AT). Tighten screws (AY) to 7-9 lb-ft (9-12 N.m).

Go on to Sheet 7.



TA251576

ASSEMBLY (Sheet 7 of 8)

29. Install valve (AZ), spring BA), gasket (BB), and plug (BC) into top of body assembly (B).

30. Using 7/8-inch socket and torque wrench, tighten plug (BC) to 90-100 lb-ft (122-136 N.m).

31. Install pin (BD), regulator valve (BE), springs (BF, BG), gasket (BH), and plug assembly (BJ) into body assembly (B).

32. Using 7/8-inch socket and torque wrench, tighten plug assembly (BJ) to 90-100 lb-ft (122-136 N.m).

NOTE

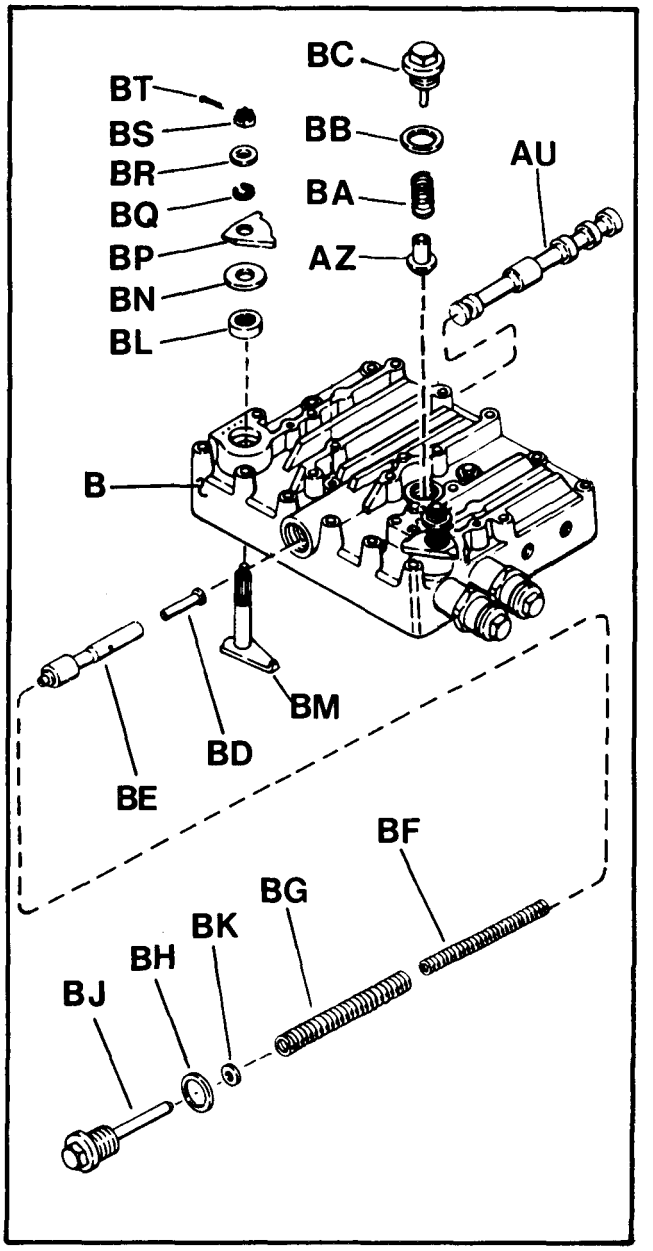
The required amount (if any) of adjustment washers (BK) will be determined by the tests in Chapter 4.

33. If seal (BL) was removed, install a new seal, spring side first, into the shift lever boss. Using arbor press, press seal to bottom of bore. Lubricate seal lip with high-temperature grease (item 14, Appendix C).

34. Install shift lever assembly (BM), being careful not to damage oil seal. Engage tang of valve lever in end groove of valve (AU).

35. Hold up on shaft (BM), to prevent disengagement of parts, and install thrust washer bearing (BN), dial pointer (BP), and with retaining ring pliers install retaining ring (BQ) on shift lever assembly (BM). Also, install washer (BR) and nut (BS). Secure nut with cotter pin (BT).

Go on to Sheet 8.



TA251577

ASSEMBLY (Sheet 8 of 8)

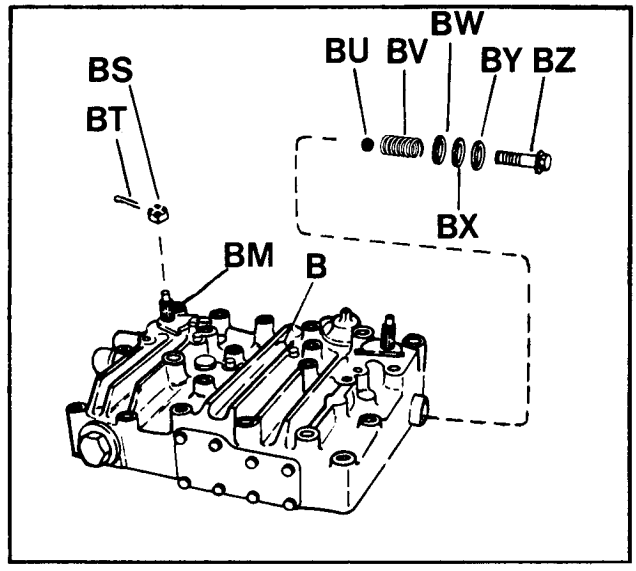
36. Install detent bearing ball (BU), spring (BV), gasket (BW), washers (BX, BY), and plug (BZ) into body assembly (B).

NOTE

Select gasket thickness of combinations thereof to produce a 60 to 85 lb-in. (7 to 10 N.m) shift torque through each detent. Use a 9/16-inch socket and 3/8-inch drive torque wrench to measure this torque requirement. Place socket on nuts (BS) of lever assembly (BM). Cotter pin (BT) may have to be removed.

37. Using 7/8-inch socket and torque wrench, tighten plug (BZ) to 40-50 lb-ft (54-68 N.m).

END OF TASK



TA251578

CHAPTER 4

TEST AND PRESERVATION

Section 1. Final Adjustments, Functional Tests and Inspection

4-1 OVERVIEW

Final adjustments, functional tests and a thorough inspection must be performed after Direct or General Support maintenance actions have been completed. Final static adjustments are made just before functional tests. Functional tests shall be performed with the transmission installed in the power pack and the power pack connected to the vehicle with aground hop kit. (Refer to the applicable vehicle TM). Final inspection must includes thorough visual inspection for oil leaks. Maintenance records shall be reviewed for complete and correct entries.

4-2 SPECIAL TOOLS

Special tools are listed and illustrated in Appendix B of this manual.

4-3 COMMON TOOLS

For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) for the maintenance activity.

4-4 SUPPORT EQUIPMENT

Vehicle and ground hop kit are required to perform functional testing of the transmission. The following fabricated tools are required with the ground hop kit. (Refer to the applicable vehicle TM for fabrication instructions).

a. Engine air cleaners (2 required)
b. Tachometer assembly

4-5 PREPARATION

Before a repaired transmission is tested, it must be filled with transmission oil (item 4, Appendix C). If it is to be tested, and then preserved and packed for storage, use break-in, shipping, and storage oil (item 6, Appendix C).

4-6 OPERATING PRECAUTIONS

The following operating precautions should be observed when testing a transmission:

WARNING

Stand clear of thrust washer bearings (transmission output flanges) whenever engine is running. Take all necessary safety precautions to eliminate possible injury to personnel or damage to equipment due to rotating output flanges.

CAUTION

Be sure to maintain oil level within proper limits. Do not operate in reverse-range with brakes released at input speeds greater than 1000 rpm. (High-speed, free-run, reverse operation may damage planetary spindles and bearings). Be sure left and right brakes are applied simultaneously when the transmission is operating in any drive range. (Separate application of one brake could cause damage due to high differential speeds). Never operate transmission with oil temperature above 300°F (155°C).

4-7 FINAL INSPECTION

After all testing is completed, perform a thorough visual inspection for signs of oil leaks. Pay particular attention to splitlines, plugs, and seals.

Thoroughly review transmission and work order records and complete entries as necessary. If a modification work order was performed, stamp applicable information onto nameplate.

BRAKE BAND, (LOW- AND REVERSE-RANGE BAND) ADJUSTMENT (Sheet 1 of 2)

TOOLS: 1-1/16-in. open end wrench
9/16-in. 1/2-in. drive socket
3/4-in. 1/2-in. drive socket
1/2-in. drive breaker bar
1/2-in. drive torque wrench
1/2 to 3/4-in. adapter

SPECIAL TOOLS: Socket wrench socket, P/N 7003946

NOTE

Procedures for adjustment of low- and reverse-range bands are identical. The following steps cover adjustment of one band. When steps are completed for one band, repeat the entire procedure for the other band.

If adjusting plate (A) was installed during assembly, use 9/16-inch socket and breaker bar to remove bolt (B). Remove washer (C) and plate (A).

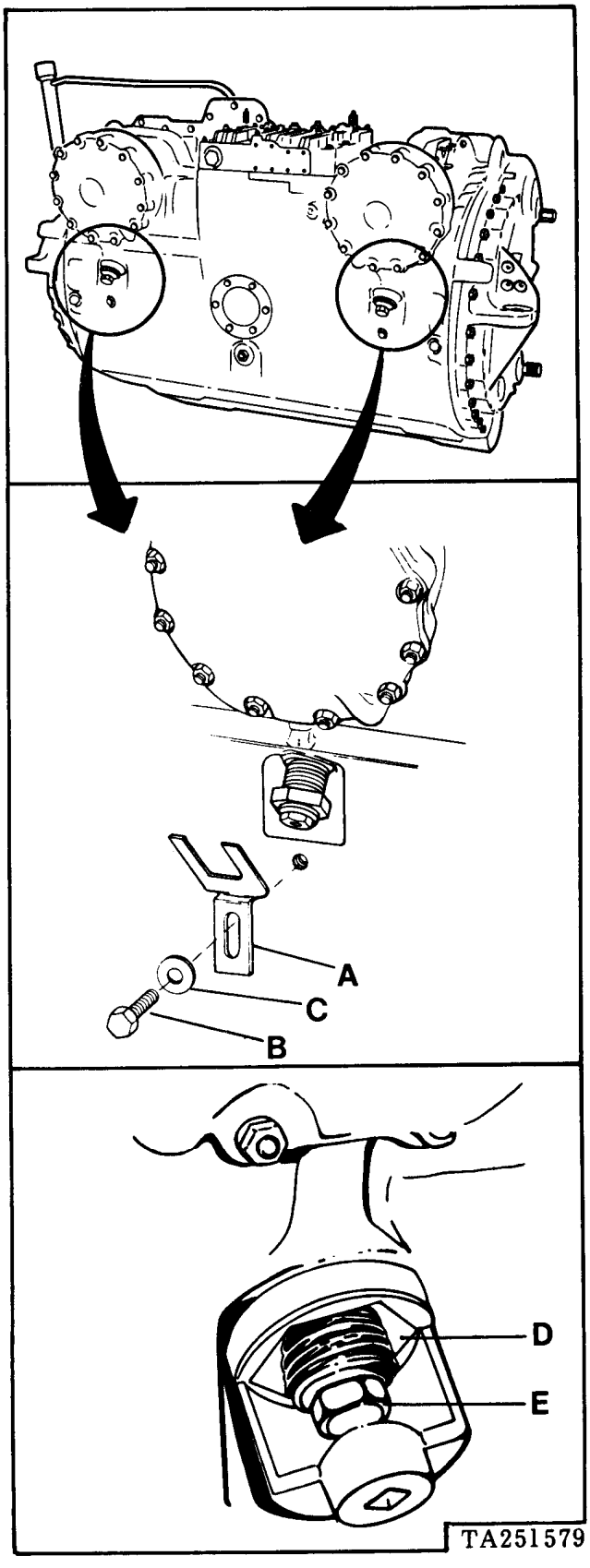
If nut (D) was tightened during assembly, use socket wrench socket, adapter, and breaker bar to loosen. Back off nut (D) several threads.

Using 3/4-inch socket and torque wrench, tighten adjusting screw (E) to approximately 30 lb-ft (41 N.m). Be sure nut (D) does not meet housing during tightening.

Back off adjusting screw (E) approximately one thread (five-to-six faces) to the nearest face that alines with slot in adjusting plate (A).

Using open end wrench on adjusting screw (E) to prevent it from turning, and socket wrench socket, adapter, and torque wrench on nut (D), tighten nut (D) to 150 lb-ft (203 N.m).

Go on to Sheet 2.

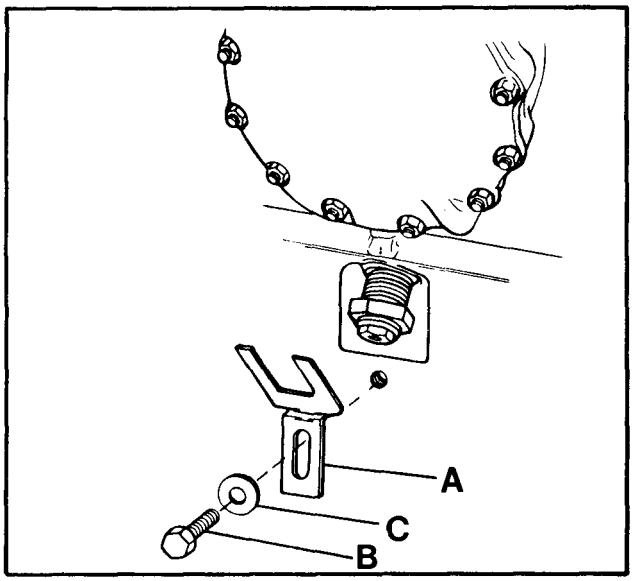


BRAKE BAND, (LOW- AND REVERSE-RANGE BAND) ADJUSTMENT (Sheet 2 of 2)

6. Install adjusting plate (A), washer (C) and bolt (B). Using 9/16-inch socket and torque wrench tighten bolt (B) to 18 to 22 lb-ft (25 to 29 N.m).

7. Repeat steps 1 thru 6 to adjust the other band.

END OF TASK



TA251580

BRAKE ADJUSTMENT (Sheet 1 of 2)

TOOLS: 7/8-in. box wrench
1-in. 1/2-in. drive socket
15/16-in. 1/2-in. drive socket
1/2-in. drive breaker bar
1/2-in. drive ratchet handle
1/2-in. drive torque wrench
3/4-in. drive torque wrench
7/16-in. combination wrench

SPECIAL TOOLS: Socket wrench socket, P/N 7003946
Socket handle
Brake apply adapter, P/N 11650096

NOTE

Procedures for adjustment of left and right brakes are identical. The following steps cover adjustment of one brake. When steps are completed for one brake, repeat the entire procedure for the other brake.

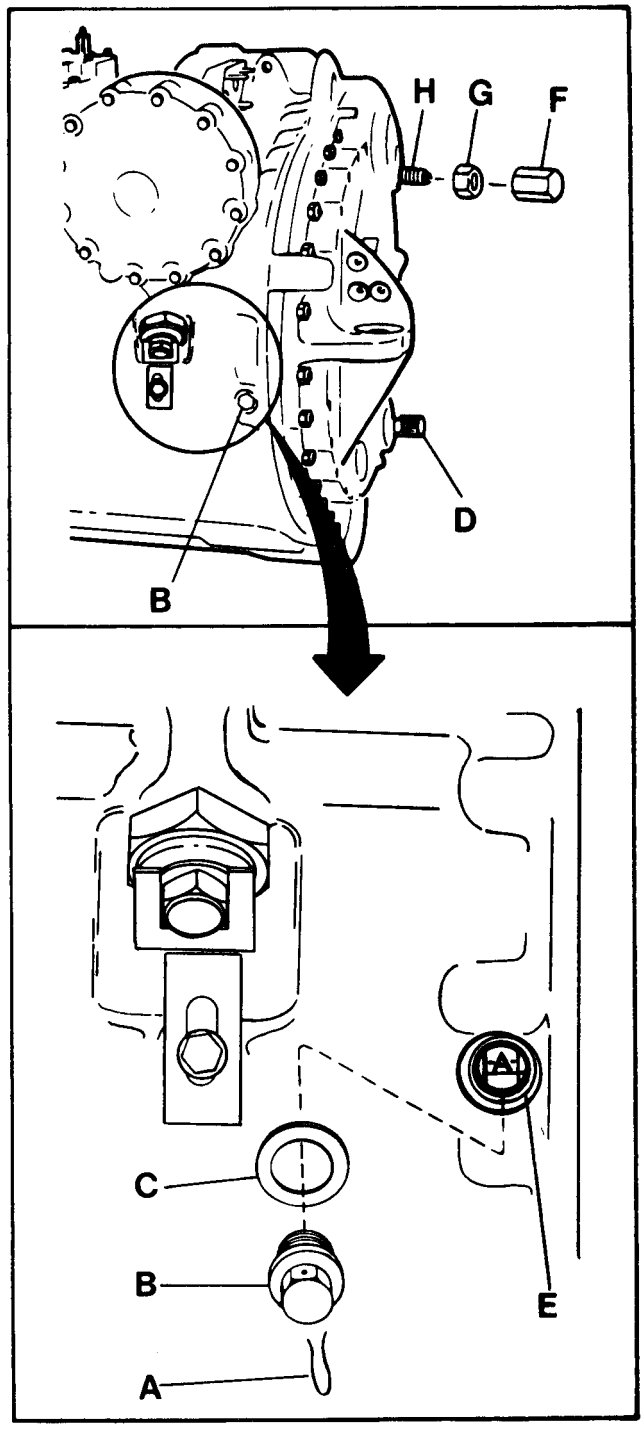
1. Remove lockwire (A) from plug (B). Using box wrench, remove plug (B). Remove gasket (C) from plug (B).

2. Using brake apply adapter and 3/4- inch drive torque wrench, apply 450 lb-ft (610 N.m) torque to shouldered shaft (brake apply shaft) (D).

3. Observe through brake inspection hole (E) position of line marked -A- in relation to chisel mark on brake anchor. If marks are alined within 1/32 inch, brake adjustment is satisfactory. If lines are further apart, release brakes and proceed as directed below.

4. Using 1-inch socket and breaker bar, remove sleeve nut (brake adjustment worm cap) (F). Using 15/16-inch socket and handle, loosen plain hexagon nut (G).

Go on to Sheet 2.



TA251581

BRAKE ADJUSTMENT (Sheet 2 of 2)

5. Using combination wrench, adjust worm shaft (H).

NOTE

Arrow marked on end cover indicates direction to turn worm shaft (H) to reduce cam travel.

6. Release brakes when making adjustment. If -A- line is below chisel mark with brake applied, brake is loose. Turn worm shaft (H) in direction of arrow to aline the lines.

7. If -A- line is above chisel mark with brake applied, brake is tight. Turn worm shaft (H) in opposite direction from arrow to aline.

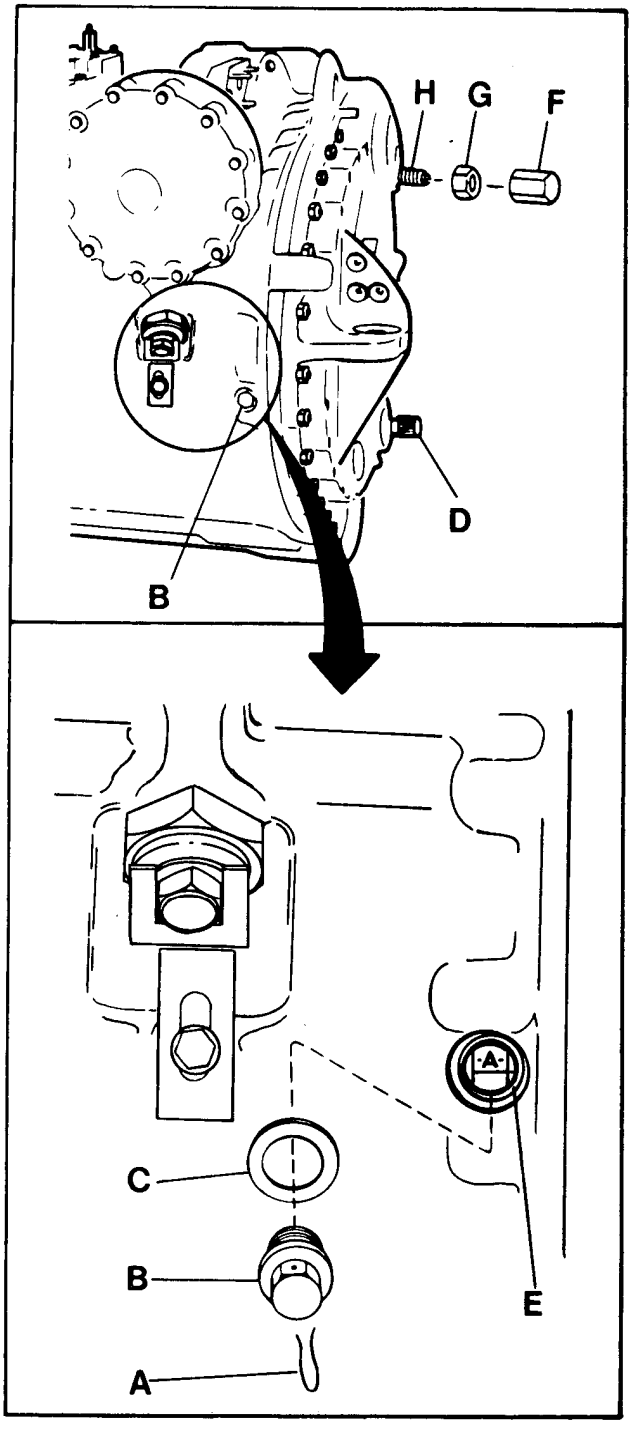
8. Ten turns of the worm shaft are required to move the -A- line approximately 1/32 inch. ALWAYS MAKE FINAL ADJUSTMENT TURNING WORM SHAFT (H) IN DIRECTION OF ARROW.

9. Using 15/16-inch socket and 1/2-inch torque wrench, tighten nut (G) to 40 to 50 lb-ft (54 to 68 N.m).

10. Install sleeve nut (F). Using 1-inch socket and 1/2-inch torque wrench, tighten nut (F) to 40 to 50 lb-ft (54 to 68 N.m). Install gasket (C) on to plug (B). Using box wrench, install brake plug (B). Tighten the plug sufficiently to prevent leakage and install the lockwire (A).

11. Repeat steps 1 thru 10 to adjust the other brake.

END OF TASK



TA251582

TEST HOOKUP

FABRICATED TOOLS:

NOTE

Refer to the applicable vehicle TM for fabrication instructions.

TOOLS: Engine air cleaners (two required)
Tachometer assembly

SPECIAL TOOLS: Ground hop kit

1. Install the transmission in the power plant. (Refer to the applicable vehicle TM).

2. Using a ground hop kit, attach the transmission to the vehicle. (Refer to the applicable vehicle TM).

3. Fill the transmission with transmission oil (item 4, Appendix C). About 90 quarts (85 liters) will be needed. If it is to be preserved and packed for storage after testing, use break-in, shipping, and storage oil (item 6, Appendix C).

END OF TASK

MAIN-PRESSURE REGULATOR VALVE ADJUSTMENT (Sheet 1 of 3)

TOOLS: 7/16-in. 1/2-in. drive socket
7/8-in. 1/2-in. drive socket
1/2-in. drive breaker bar
1/2-in. drive torque wrench
7/16-in. combination wrench

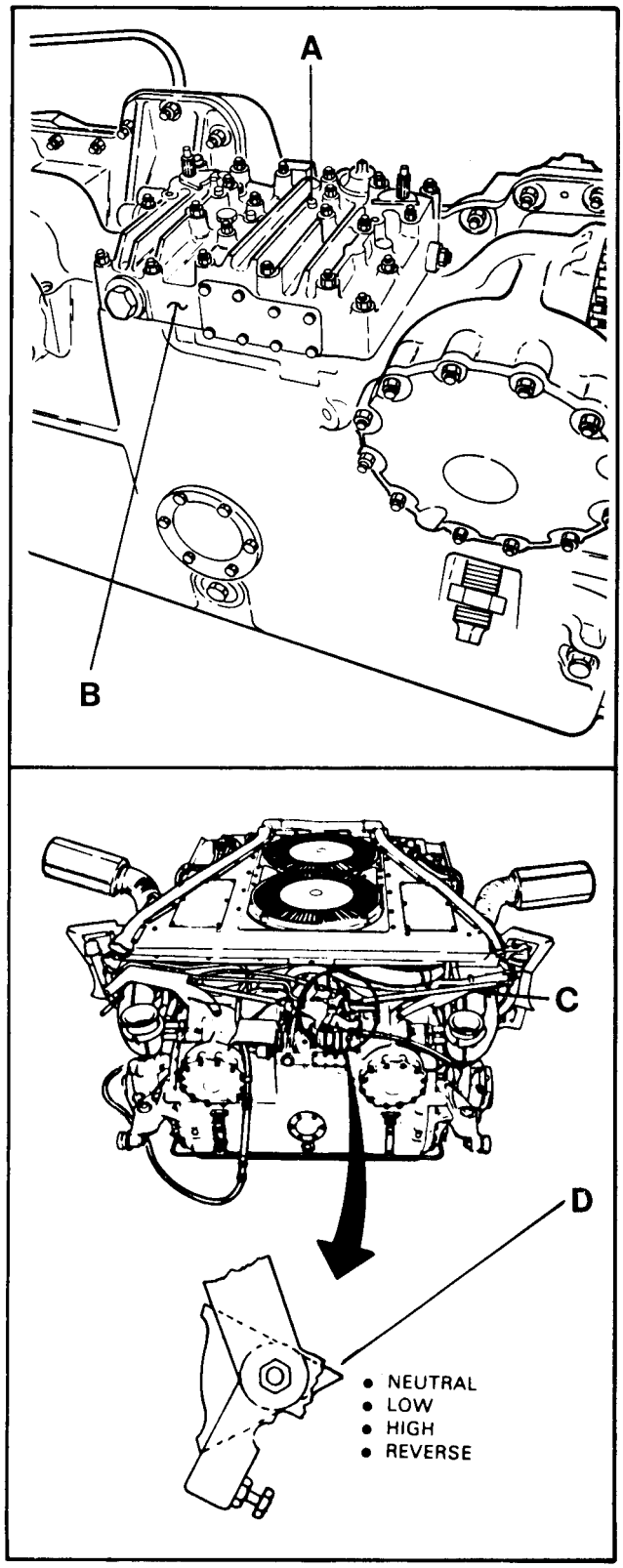
SPECIAL TOOLS: Pressure gage, P/N 7950330

PRELIMINARY PROCEDURE: Page 4-7

1. Using 7/16-inch socket and breaker bar, remove pipe plug (A) from body (B). Install fitting on hose of pressure gage in hole where plug (A) was removed. Tighten fitting with combination wrench.

2. Set transmission in neutral by grasping shift lever (C) and pulling or pushing to set indicator (D) to neutral.

Go on to Sheet 2.



TA251583

MAIN-PRESSURE REGULATOR VALVE ADJUSTMENT (Sheet 2 of 3)

NOTE

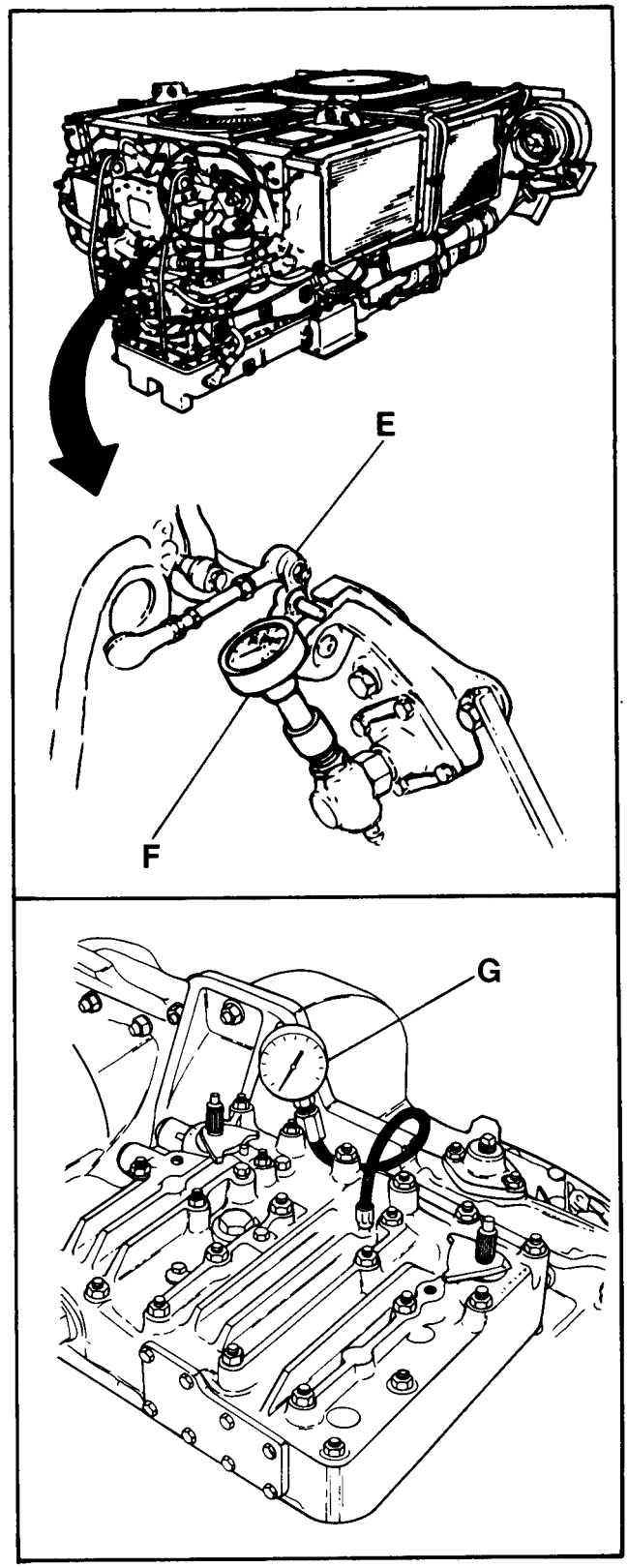
Oil pressure must be checked with oil temperature within normal operating range of 160 to 270°F (71 to 132°C).

3. Start and operate engine until normal operating temperature is reached. (Refer to applicable vehicle TM).

4. Using your hand, slowly pull on throttle lever (E) until tachometer (F) indicates 1800 rpm.

5. Check pressure gage (G). If pressure is at least 180 psi (1241 kPa), test is satisfactory. If pressure is below 180 psi (1241 kPa), proceed with step 6.

Go on to Sheet 3.



TA251584

MAIN-PRESSURE REGULATOR VALVE ADJUSTMENT (Sheet 3 of 3)

6. Stop engine. Using 7/8-inch socket and breaker bar, remove plug (H), gasket (J), and washer(s) (K) from body (B). There may be two or more washers (K) in the assembly.

NOTE

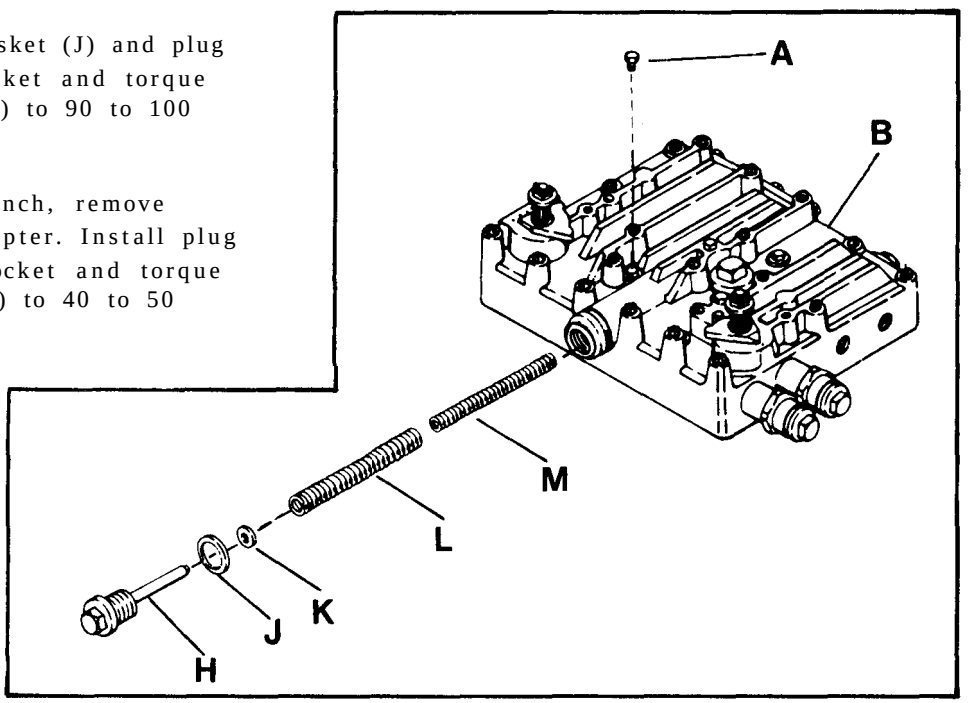
If this does not bring pressure up to 180 psi (1241 kPa), remove and replace springs (L) and (M).

7. To raise pressure, add washers. This will increase pressure by approximately 6 psi (41 kPa) for each washer. Do not use more than four washers.

8. Install washer(s) (K) gasket (J) and plug (H). Using 7/8-inch socket and torque wrench, tighten plug (H) to 90 to 100 lb-ft (122 to 136 N.m).

9. Using combination wrench, remove pressure gage hose adapter. Install plug (A). Using 7/16-inch socket and torque wrench, tighten plug (A) to 40 to 50 lb-ft (54 to 68 N.m).

END OF TASK



TA251585

CONVERTER PRESSURE REGULATOR VALVE ADJUSTMENT (Sheet 1 of 3)

TOOLS: 1/2-in. drive ratchet handle
7/16-in. 1/2-in. drive socket
7/8-in. 1/2-in. drive socket
1/2-in. drive breaker bar
1/2-in. drive torque wrench
7/16-in. combination wrench

SPECIAL TOOLS: Pressure gage, P/N 7950330

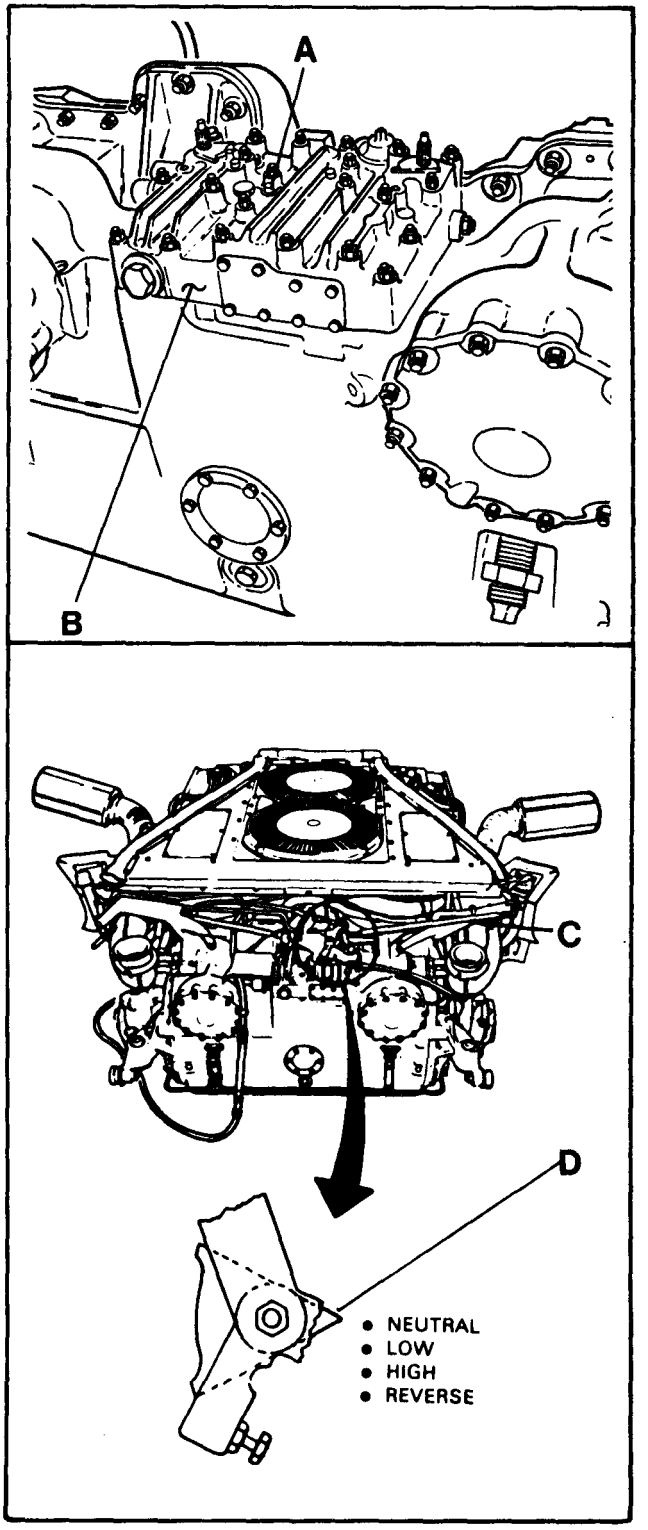
PRELIMINARY PROCEDURE: Perform Main-Pressure Regulator Valve Adjustment (page 4-8)

1. Using 7/16-in. socket and ratchet handle, remove plug (A) from body (B).

2. Install fitting on hose of pressure gage in hole where plug (A) was removed. Tighten fitting with combination wrench.

3. Set transmission in neutral by grasping shift lever (C) and pulling or pushing to set indicator (D) to neutral.

Go on to Sheet 2.



TA251586

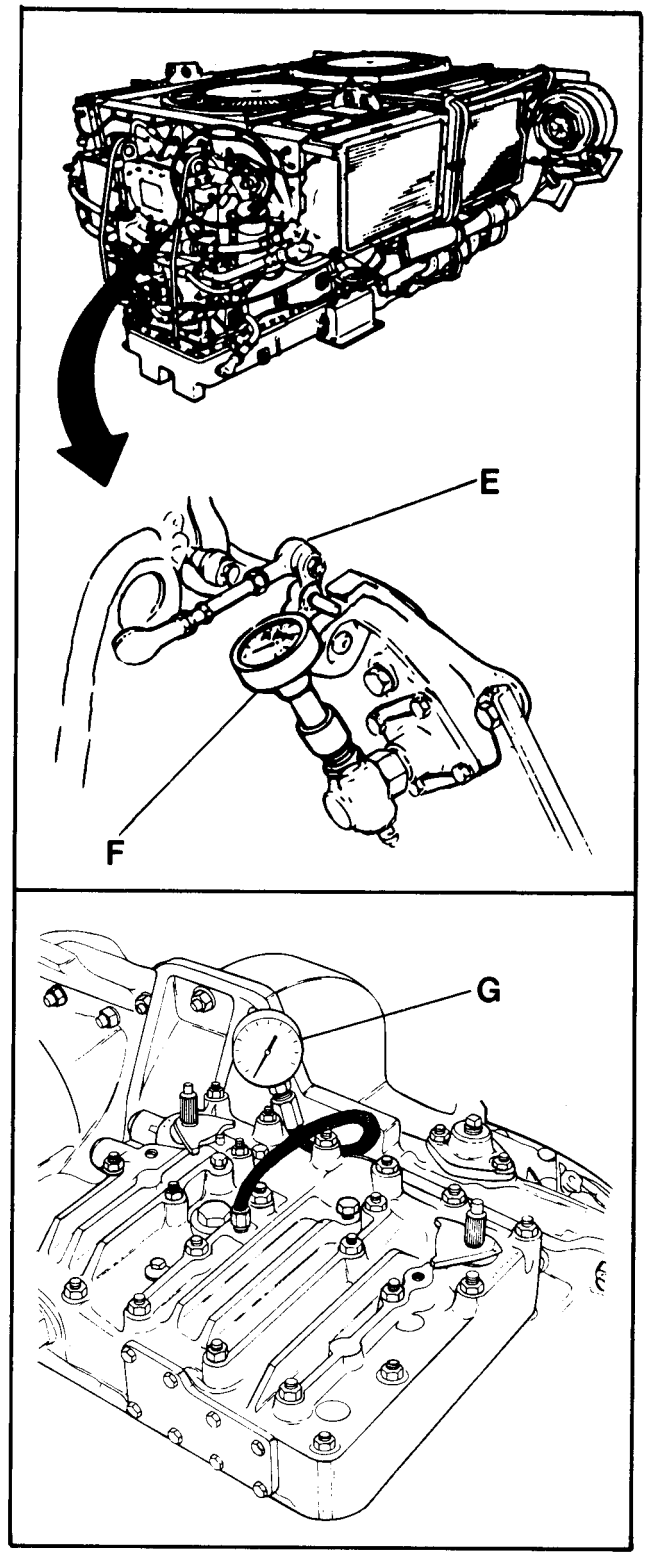
CONVERTER PRESSURE REGULATOR VALVE ADJUSTMENT (Sheet 2 of 3)

4. Start and operate engine until normal operating temperature is reached. (Refer to applicable vehicle TM).

5. Using your hand, slowly pull on throttle (E) until tachometer (F) indicates 1800 rpm.

6. Check pressure gage (G). If pressure is above 64 psi (441 kPa), test is satisfactory. If pressure is below 64 psi (441 kPa), proceed with step 7.

Go on to Sheet 3.



TA251587

CONVERTER PRESSURE REGULATOR VALVE ADJUSTMENT (Sheet 3 of 3)

7. Stop engine. Using 7/8-inch socket and breaker bar, remove plug (H), gasket (J), stop (K), and spacer (L) from body (B). There may be more than one spacer (L).

8. To raise pressure, add spacers (L). Do not use more than five spacers. To lower pressure, remove spacers. Each spacer will change the pressure about 4.7 psi (32 kPa).

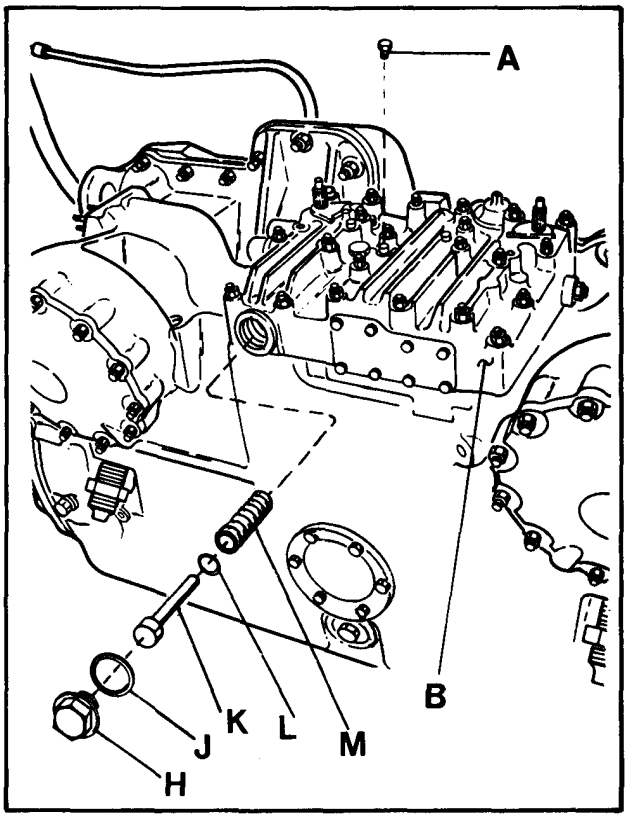
NOTE

If pressure cannot be raised to the minimum required with the installation of five spacers (L), replace regulator spring (M).

9. Install spacer(s) (L), stop (K), gasket (J), and plug (H) in body (B). Using 7/8-inch socket and torque wrench, tighten plug (H) to 90 to 100 lb-ft (122 to 136 N.m).

10. Remove gage hose adapter using combination wrench and install plug (A). Using 7/16-inch socket and torque wrench, tighten plug (A) to 40 to 50 lb-ft (54 to 69 N.m).

END OF TASK



TA251588

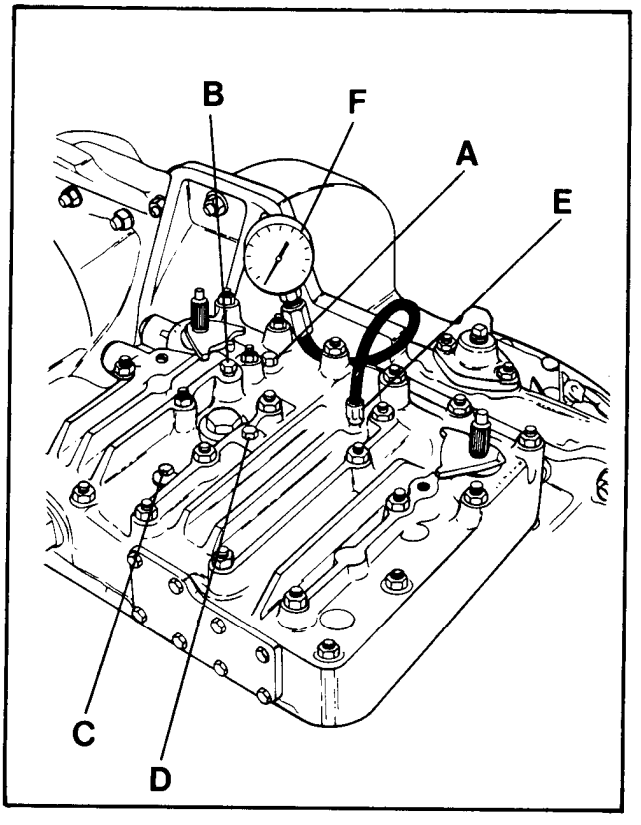
ADDITIONAL OIL PRESSURE TESTS

TOOLS: 1/2-in. drive ratchet handle
7/16-in. 1/2-in. drive socket
1/2-in. drive torque wrench
7/16-in. combination wrench

SPECIAL TOOLS: Pressure gage, PN 7950330

PRELIMINARY PROCEDURES: Perform Main-Pressure Regulator Valve Adjustment (page 4-8)

Additional oil pressure test points are provided in the transmission body assembly (control valve body assembly). These pressures can be tested by removing the appropriate plug and connecting the pressure gage hose. Normal operating pressures are shown in the table below. All pressure tests must be made with oil temperature between 160 to 270 degrees F (71 to 132 degrees C) and with input rpm at approximately 1800.



A - Right-Steer Clutch
B - Left-Steer Clutch
C - Lubricating Oil
D - Torque Converter Oil Feed Line
E - Main-Oil Pressure From Pump
F - Gage

Pressure Test Points	Nominal Pressure psi	Nominal Pressure kPa
Main line (in low, neutral and reverse)	200	1379
Main line (in high)	125	862
Lubricating oil	40	276
Converter oil feed line	80	552
Left-steer clutch	Same as for main line	
Right-steer clutch	Same as for main line	

END OF TASK

TA251589

STALL TEST (Sheet 1 of 3)

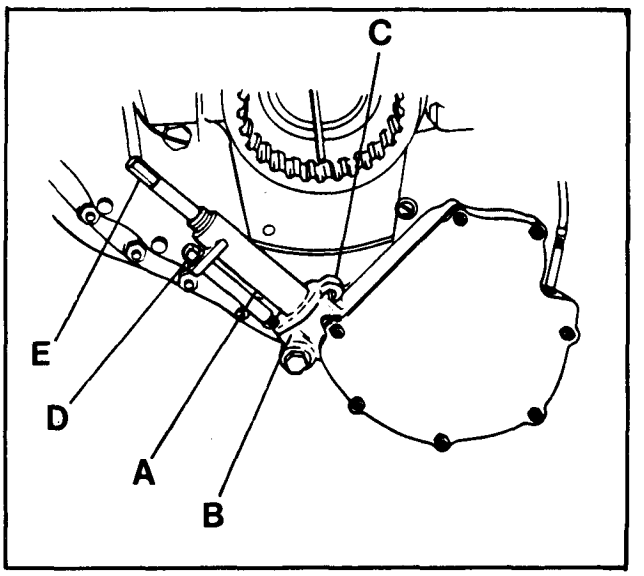
TOOLS: 9/16-in. combination wrench
1/2-in. drive ratchet handle
1/2-in. drive torque wrench
3/4-in. 1/2-in. drive socket

SPECIAL TOOLS: Brake applicator tool, P/N 10933755 (two required)

PRELIMINARY PROCEDURES: Perform Main-Pressure Regulator Valve Adjustment (page 4-8)

1. Position brake applicator tool (A) over rod sticking out of brake housing (B).
2. Engage catch (C) of tool into notch in brake housing.
3. Using combination wrench, tighten nut (D) to secure brake applicator tool (A) to brake housing (B).
4. Using socket and ratchet handle, set brake by rotating hex head bolt (E) until bottom of bolt hex is about one inch from top of tube.
5. Using torque wrench, tighten bolt (E) to 10-20 lb-ft (14-27 N.m).
6. Repeat steps 1 through 5 to install other brake applicator tool.

Go on to Sheet 2.



TA251590

STALL TEST (Sheet 2 of 3)

WARNING

Stand clear of thrust washer bearings (transmission output flanges) whenever engine is running. Take all necessary safety precautions to eliminate possible injury to personnel or damage to equipment due to rotating output flanges.

7. Start and operate engine until normal operating temperature is reached. (Refer to the applicable vehicle TM).

CAUTION

Do not stall test for more than 30 seconds at full throttle or allow oil temperature to exceed 300°F (135°C). Excessive heat will damage transmission parts.

8. Shift transmission to high range by grasping shift lever (F) and pull or push to set indicator (G) to high range.

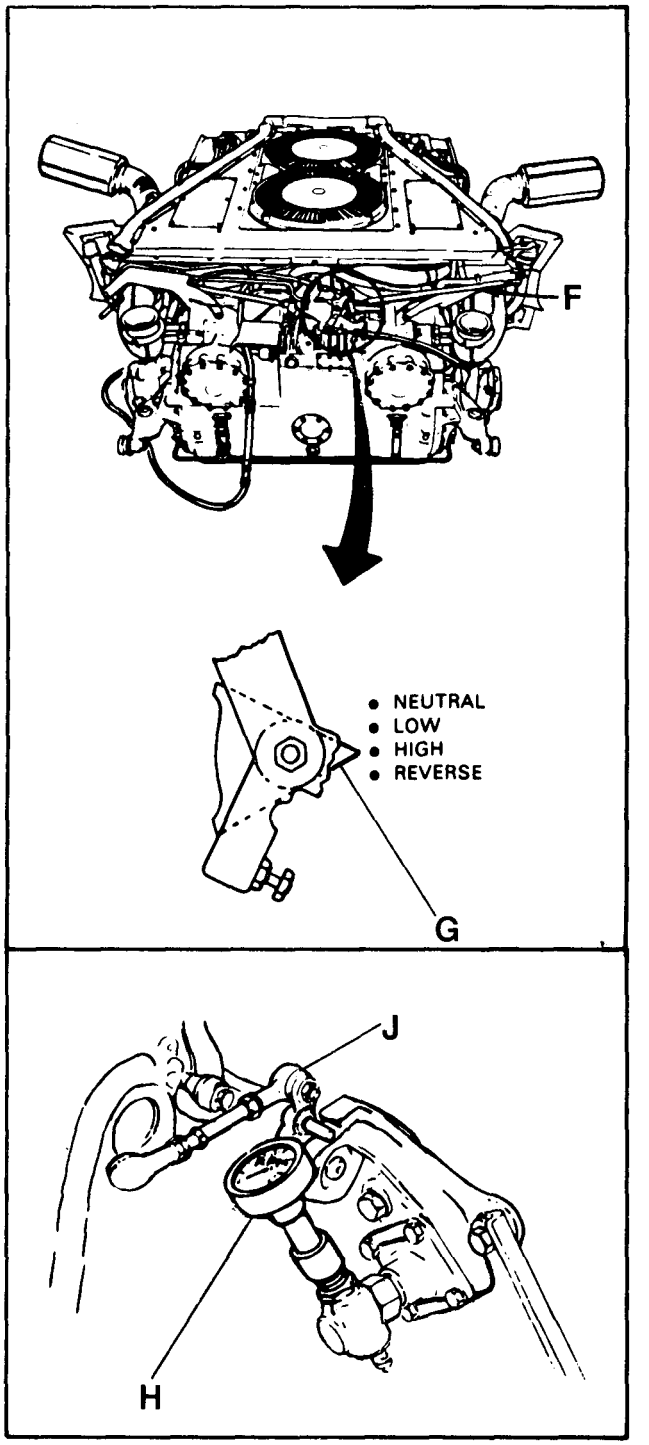
9. Install tachometer (H) onto tachometer adapter at right top of engine.

10. Watch tachometer (H) and using your hand, pull throttle lever (J) to full throttle for no more than 30 seconds.

11. Repeat step 10 two more times.

12. If engine speed is below 1800 rpm, engine is not operating properly. If engine speed is over 2050 rpm, there is clutch slippage in the transmission. Troubleshoot any overspeed indication in accordance with troubleshooting table in Chapter 2.

Go on to Sheet 3.



TA251591

STALL TEST (Sheet 3 of 3)

NOTE

A stall test may also be made to check for slippage in the low- and reverse-range bands.

13. To perform a stall test in low or reverse, repeat steps 8 through 11 except shift the transmission to low or reverse as needed.

14. If engine speed is below 1800 rpm, engine is not operating properly. If engine speed is over 2050 rpm, low- or reverse-range band slippage is indicated. Adjust the band (refer to page 4-3).

15. After adjusting band(s), repeat steps 8 through 11. If slippage still exists, troubleshoot per the troubleshooting table in Chapter 2.

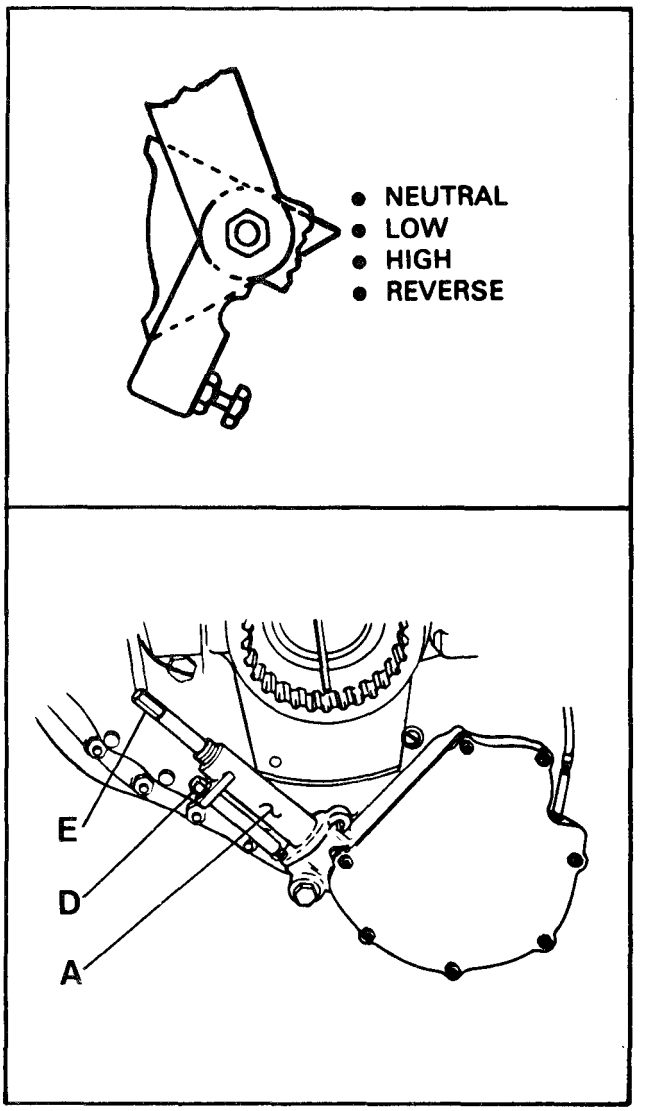
16. When tests are completed, shut down engine (refer to the applicable vehicle TM).

17. Using socket and ratchet handle, loosen bolt (E) to release brake.

18. Using combination wrench, loosen nut (D) to release brake applicator tool (A). Remove the tool.

19. Repeat steps 17 and 18 to remove the other brake applicator tool.

END OF TASK



TA251592

OPERATIONAL CHECKS

TOOLS: None

PRELIMINARY PROCEDURE: Perform Main-Pressure Regulator Valve Adjustment (page 4-8)

WARNING

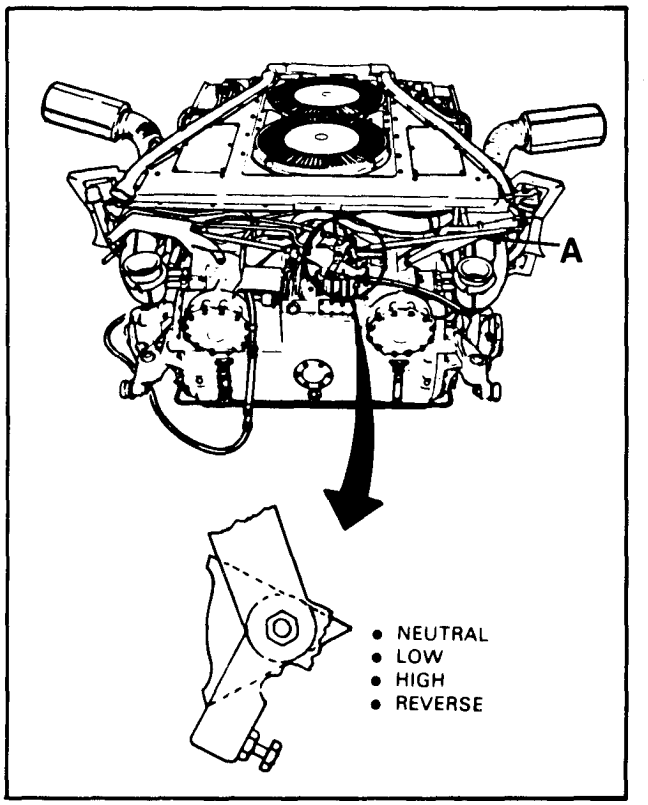
Stand clear of thrust washer bearings (transmission output flanges) whenever engine is running. Take all necessary safety precautions to eliminate possible injury to personnel or damage to equipment due to rotating output flanges.

CAUTION

Do not run the engine at greater than 1000 rpm with the transmission in reverse range. High-speed, free-run operation in reverse range may damage planetary spindles and bearings.

1. Start and operate engine until normal operating temperature is reached. (Refer to the applicable vehicle TM).
2. Shift the transmission through all ranges by grasping shift lever (A) and pulling or pushing to select each range.
3. Troubleshoot any indication of malfunction (refer to troubleshooting table in Chapter 2).

END OF TASK



TA251593

Section II. PRESERVATION AND PACKING

4-9 OVERVIEW

Transmissions repaired at Direct or General Support level are usually reinstalled in an end-item vehicle. Sometimes repaired transmission istobe returned to a depot or retained in long-term storage. It must then be properly preserved and packed in accordance with the following procedures and applicable specifications.

4-10 PREPARATION

a. Remove drain plugs and allow all fluid to drain from transmission. Reinstall drain plugs and securely tighten.

b. Install appropriate plugs on all outlet and inlet fittings for lines to oil cooler.

c. Repaint surfaces that have been nicked or scratched.

d. Apply corrosion prevention compound, (item 29, Appendix C) to all exposed surfaces which are not painted or plated.

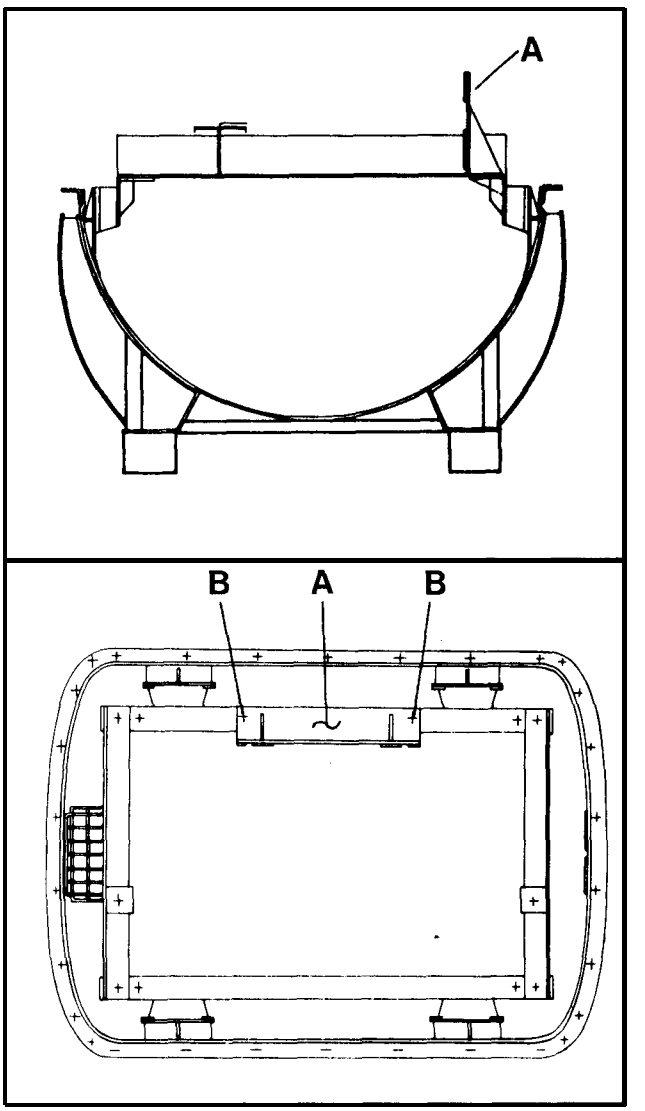
INSTALL IN SHIPPING CO NTAINER (Sheet 1 of 2)

TOOLS: 15/16-in. box wrench
1-1/2-in. box wrench
5/8-in. box wrench
15/16-in. 1/2-in. drive socket
11/16-in. 1/2-in. drive socket
1-1/2-in. 3/4-in. drive socket
1/2-in. drive torque wrench
3/4-in. drive torque wrench
1/2-in. drive 5-in. extension
Hoist, 2-ton minimum capacity

SPECIAL TOOLS: Lifting sling,
P/N 7981593

PERSON NEL: Two required

1. Install gasket, P/N 7708052, against engine mounting flange of transmission.
2. Remove side bracket assembly (A) from lower section of container. Using your hand, install eight bolts, washers and safety nuts so that side bracket is fastened to transmission mounting flange.
3. Using 5/8-inch box wrench to hold bolts and 11/16-inch socket and 1/2-inch torque wrench to turn nuts, tighten to 32-38 lb-ft (43-52 N.m).
4. Using sling and hoist, position transmission and side bracket in lower half of shipping container.
5. Install two bolts at locations (B) to join side bracket (A) to lower section of container and install two washers and nuts on bolts.
6. Using 15/16-inch box wrench to hold bolts and 15/16-inch socket and torque wrench to turn nuts at locations (B), tighten to 88-105 lb-ft (119-142 N.m).
7. Fasten right and left transmission lugs to right and left bracket assemblies, P/N 8723314 and P/N 8723315, respectively.



TA251594

Go on to Sheet 2.

INSTALL IN SHIPPING CONTAINER (Sheet 2 of 2)

8. Install two bolts and nuts at locations (C). Using 1-1/2-inch box wrench to hold bolts and 1-1/2-inch socket and torque wrench to turn nuts, tighten to 100-150 lb-ft (122-203 N.m).

9. Place six 16-unit bags (96 units total) of dehydrating agent (item 22, Appendix C) in container dessicant basket (D).

10. Install splitline gasket (E) on flange of shipping container lower half. Using sling and hoist, position upper half of container on lower half.

11. Install 30 bolts (F) through the flanges on the upper and lower halves of the container. Install 30 nuts (G) on bolts (F).

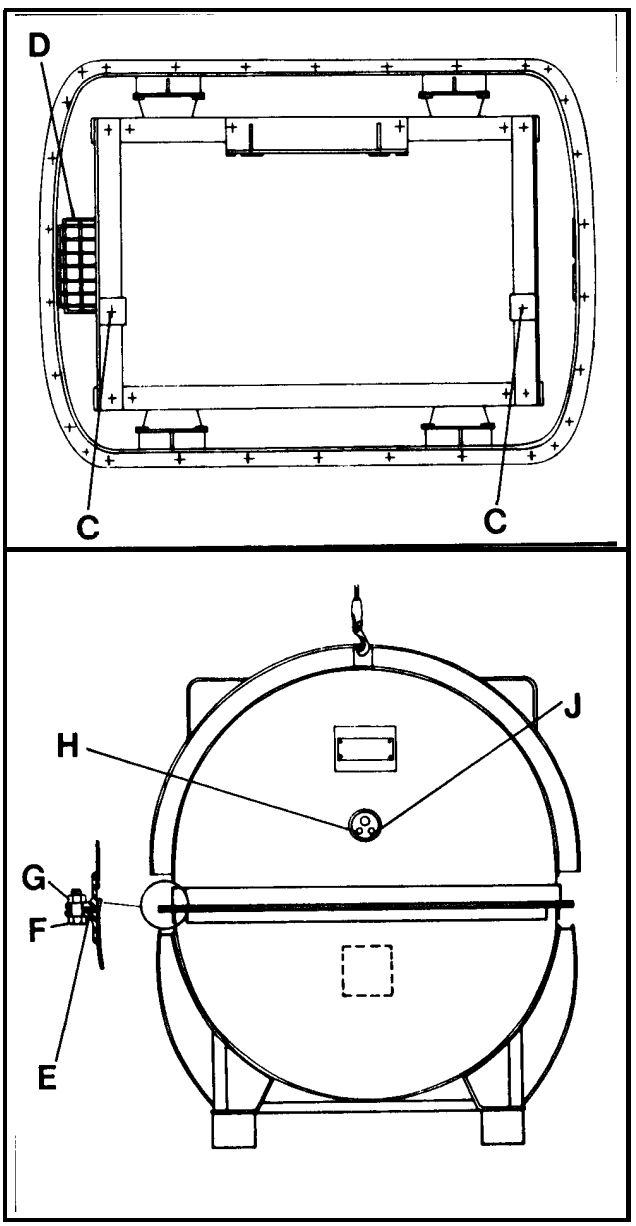
NOTE

Alternately tighten bolts 180° apart to half of minimum torque. Repeat the process, tightening to the torque specified.

12. Using 15/16-inch box wrench to hold bolts (F) and 15/16-inch socket, extension, and torque wrench to turn nuts (G), tighten to 88 to 105 lb-ft (119 to 137 N.m).

13. Open relief valve (H) on end of container and purge interior with dry air. Close relief valve (H) and use air valve (J) to pressurize container to 5 psi (35 kPa).

END OF TASK



TA251595

APPENDIX A

REFERENCES

A-1. Publication Indexes

The following indexes should be consulted frequently for latest changes or revisions of references given in this Appendix and for new publications relating to material covered in this manual.

DA PAM 310-1	Index of Administrative Publications
DA PAM 310-2	Index of Blank Forms
DA PAM 310-3	Index of Doctrinal, Training and Organizational Publications
DA PAM 310-4	Index of Technical Manuals, Technical Bulletins and Lubrication Orders
DA PAM 108-1	Index of Army Motion Pictures and Related Audio-Visual Devices
DA PAM 310-6	Index of Supply Catalogs, Supply Manuals (excluding types 7, 8 & 9)
DA PAM 310-70	Index of Modification Work Orders

A-2. Publication References

TM 9-208-1	Cleaning of Ordnance Material
TM 9-214	Inspection, Care, and Maintenance of Antifriction Bearings
TM 9-237	Operator's Manual: Welding Theory and Application
TM 38-230-1	Preservation, Packaging, and Packing of Military Supplies and Equipment: Preservation and Packaging (Volume I)
TM 38-230-2	Preservation, Packaging, and Packing of Military Supplies and Equipment: Pack- ing (Volume II)
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 38-750-1	The Army Maintenance Management System (TAMMS) Field Command Procedures
TB 9-255	Description and Application of Oil Seals, Packings and Packing Materials, and Gaskets and Gasket Materials
TB 9-344	Inspection of Materiel: Fluorescent and Dye Penetrant Methods
TB 43-0210	Nonaeronautical Equipment, Army Oil Analysis Program
TB 43-0211	Oil Analysis Program User's Guide, Nonaeronautical Equipment

APPENDIX B
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST (INCLUDING DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS) FOR CD850-6A W/CONTAINERS NSN 2520-00-086-7792 AND CD850-6A-1 W/CONTAINERS NSN 2520-01-159-6214

CURRENT AS OF 7 JULY, 1983

SECTION I. INTRODUCTION

1. SCOPE.

This appendix lists spares and repair parts and special tools required for the performance of Direct Support and General Support Maintenance of the CD850-6A and CD850-6A1 transmissions. It authorizes the requisitioning and issue of spares and repair parts as indicated by the source and maintenance codes.

2. GENERAL.

This Repair Parts and Special Tools List is divided into the following sections

a. Section II. Repair Parts List. A list of spares and repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in numerical sequence, with the parts in each group listed in figure and item number sequence.

b. Section III. Special Tools List. A list of special tools and support equipment authorized for the performance of maintenance.

c. Section IV. National Stock Number and Part Number Index. A list, in national item identification number (NIIN) sequence, of all national stock numbers (NSN) appearing in the listing, followed by a list in alphameric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

3. EXPLANATION OF COLUMNS.

a. Illustration. This column is divided as follows:

(1) Figure Number. Indicates the figure number of the illustration in which the item is shown.

(2) Item Number. The number used to identify each item called out in the illustration.

b. Source, Maintenance, and Recoverability Codes (SMR).

(1) Source Code. Source codes indicate the manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

Code	Definition
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purpose because essentiality dictates that a minimum quantity be available in the supply systems.
PC	Item procured and stocked and which otherwise would be coded PA except that it is deteriorative in nature.
PD	Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional initial issues or outfittings. Not subject to automatic replenishment.
PE	Support equipment procured and stocked for initial issue or outfitting to specified maintenance repair activities.
PF	Support equipment which will not be stocked but which will be centrally procured on demand.
PG	Item procured and stocked to provide for sustained support for the life of the equipment. It is applied to an item peculiar to the equipment which, because of probable discontinuance or shutdown of production facilities, would prove uneconomical to reproduce at a later time.
KD	An item of depot overhaul/ repair kit and not purchased separately. Depot kit is defined as a kit that provides items required at the time of overhaul or repair.
KF	An item of a maintenance kit and not purchased separately. Maintenance kit is defined as a kit that provides an item that can be replaced at organizational or intermediate levels of maintenance.
KB	Item included in both a depot overhaul / repair kit and a maintenance kit.
MO	Item to be manufactured or fabricated at organizational level.
MF	Item to be manufactured or fabricated at the direct support maintenance level.
MH	Item to be manufactured or fabricated at the general support maintenance level.
MD	Item to be manufactured or fabricated at depot maintenance level.
AO	Item to be assembled at organizational level.
AF	Item to be assembled at the direct support maintenance level.
AH	Item to be assembled at the general support maintenance level.
AD	Item to be assembled at depot maintenance level.
XA	Item is not procured or stocked because the requirements for the item will result in the replacement of the next higher assembly.

Code	Definition
XB	Item is not procured or stocked. If not available through salvage, requisition.
XD	A support item that is not stocked. When required, item will be procured through normal supply channels.

NOTE Cannibalization or salvage may be used as a source of supply for any items coded above except those coded XA.

(2) Maintenance Code. Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Codes format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance:

Code	Application/Explanation
C	Crew or operator maintenance performed within organizational maintenance.

Code	Definition
O	Support item is removed, replaced, used at the organizational level.
F	Support item is removed, replaced, used at the direct support level.
H	Support item is removed, replaced, used at the general support level.
D	Support items that are removed, replaced, used at depot, mobile depot, specialized repair activity only.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). This position contains one of the following maintenance codes:

Code	Application/Explanation
O	The lowest maintenance level capable of complete repair of the support item is the organizational level.
F	The lowest maintenance level capable of complete repair of the support item is the direct support level.
H	The lowest maintenance level capable of complete repair of the support item is the general support level.
D	The lowest maintenance level capable of complete repair of the support item is the depot level.
L	Repair restricted to designated specialized repair activity.
Z	Nonreparable. No repair is authorized.

B	No repair is authorized. The item may be reconditioned by adjusting, lubricating, etc., at the user level. No parts or special tools are procured for the maintenance of this item.

(3) Recoverability Code. Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Recoverability

Code	Definition
Z	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.

Code	Application/Explanation
O	Reparable item. When uneconomically reparable, condemn and dispose at organizational level.
F	Reparable item. When uneconomically reparable, condemn and dispose at the direct support level.
H	Reparable item. When uneconomically reparable, condemn and dispose at the general support level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.
L	Reparable item. Repair, condemnation, and disposal not authorized below Depot/ Specialized Repair Activity Level.

Code	Application/Explanation
A	Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material or hazardous material). Refer to appropriate manuals/ directives for specific instructions

c. National Stock Number. Indicates the National stock number assigned to the item and which will be used for requisitioning.

d. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection require ments to identify an item or range of items.

NOTE: When a stock numbered item is requisitioned, the item received may have a different part number than the part being replaced.

e. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code listed in SB708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. Description. Indicates the Federal item name and, if required, a minimum description to identify the item. Items that are included in kits and sets are listed below the name of the kit or set with the quantity of each item in the kit or set indicated in the quantity incorporated in unit column. When the part to be used differs between serial numbers of the saline model, the effective serial numbers are shown as the last line of the description.

g. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. Quantity Incorporated in Unit. Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable (e.g., shims, spacers, etc.).

4. SPECIAL INFORMATION.

a. Usable on codes are shown in the description column. Uncoded items are applicable to all models. Identification of the usable codes used in this publication are (not applicable).

b. Detailed assembly instructions for items source coded to be assembled are found in (TM 9-2520-223-34).

c. Repair parts kits and gasket sets appear as the last entries in the repair parts listing for the figure in which its parts are listed as repair parts.

5. HOW TO LOCATE REPAIR PARTS.

a. When National Stock Number or Part Number is Unknown:

(1) First. Using the table of contents, determine the functional subgroup within which the repair part belongs. This is necessary since illustrations are prepared for functional subgroups, and listings are divided into the same groups.

(2) Second. Using the pictorial contents of the exploded transmission in figure 2, determine the functional subgroup and the illustration (within that subgroup) to which the item belongs.

(3) Third. Find the illustration covering the functional subgroup to which the item belongs.

(4) Fourth. Identify the item on the illustration and note the illustration figure and item number of the repair part.

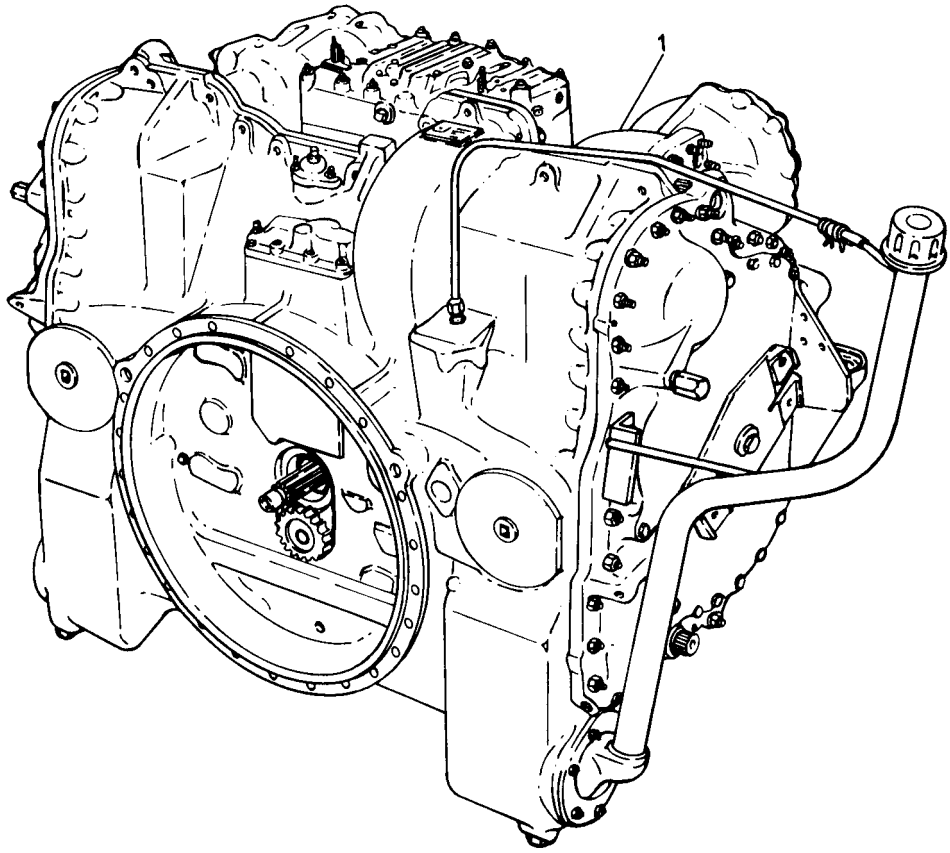
(5) Fifth. Using the Repair Parts Listing, find the figure and item number noted on the illustration.

b. When National Stock Number or Part Number is known:

(1) First. Using the Index of National Stock Numbers and Part Numbers, find the pert inent National Stock Number or Part Number. This index is in NIIN sequence followed by a list of part numbers in alphameric sequence, cross-referenced to the illustration figure number and item number.

(2) Second. After finding the figure and item number, locate the figure and item number in the repair parts list.

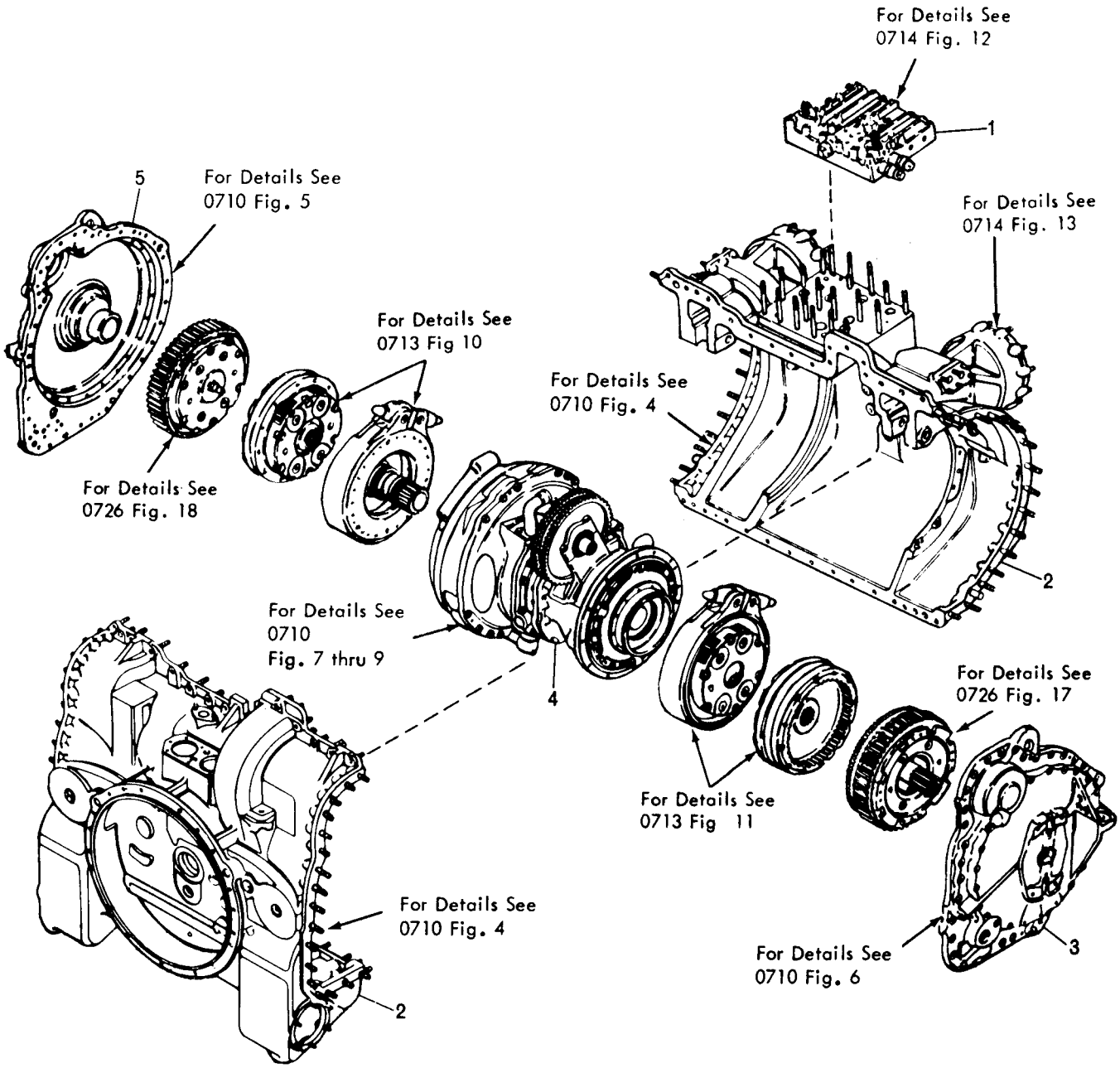
6. ABBREVIATIONS (not applicable).



TA 272405

Figure B-1. Transmission assembly

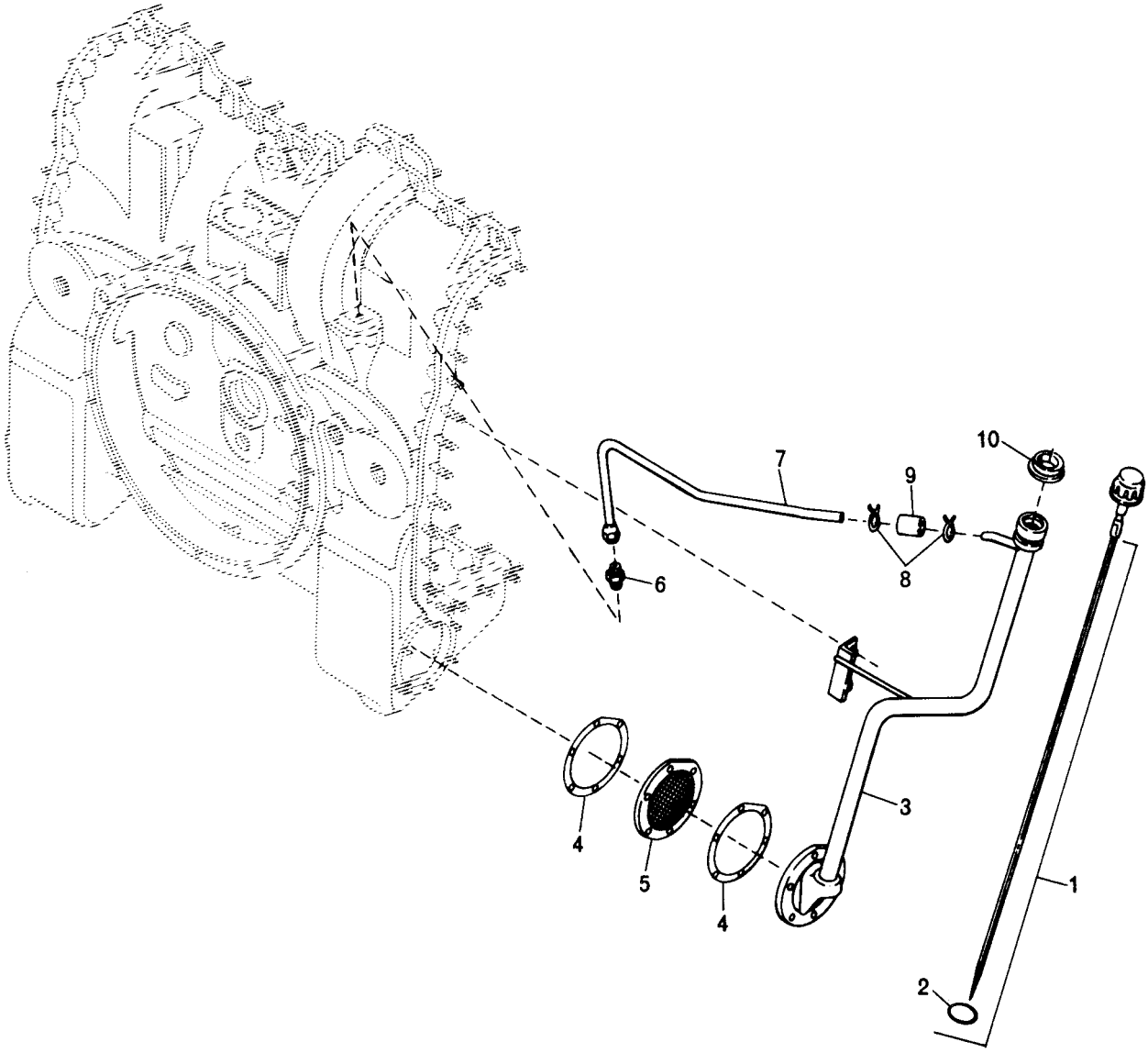
(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 07 TRANSMISSION		
						GROUP: 0710 TRANSMISSION ASSEMBLY		
B-1	NI	PAFFD	2520-01-159-6214	19207	5703172	TRANSMISSION,CROSS DRIVE W/CONTAINER (CD850-6A-1)	EA	1
B-1	NI	PAFFD	2520-00-086-7792	19207	5703101	TRANSMISSION,CROSS DRIVE W/CONTAINER (CD850-6A)	EA	1
B-1	1	PAOHD	2520-01-163-1431	19207	11650111	TRANSMISSION,CROSS DRIVE CD850-6A-1 USED WITH OIL PUMPS PN 23014066 AND 23014082	EA	1
B-1	1	PAOHD	2520-00-086-7791	19207	8355830	TRANSMISSION,CROSS DRIVE CD850-6A USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1



TA 272406

Figure B-2. Pictorial index

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0710 TRANSMISSION ASSEMBLY-- PICTORIAL INDEX		
B-2	1	PAFDD	2520-01-022-9748	19207	11649939	VALVE ASSEMBLY (SEE FIG. 12)	EA	1
B-2	2	PAHDD	2520-00-133-9636	19207	8355833	HOUSING,MECHANICAL (SEE FIG.4)	EA	1
B-2	3	XAHDD		19207	7709403	COVER ASSEMBLY (SEE FIG. 6)	EEA	1
B-2	4	XAHHH		19207	8350530	UNIT ASSEMBLY (SEE FIG. 7, 8 & 9) USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-2	4	XAHHH		19207	11650107	UNIT ASSEMBLY (SEE FIG.7, 8 & 9) USED WITH OIL PUMPS PN 23014066 AND 23014082	EA	1
B-2	5	XAHDD		19207	7709402	COVER ASSEMBLY (SEE FIG. 5)	EA	1



TA 272407

Figure B-3. Side oil filler

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0710 TRANSMISSION ASSEMBLY-- SIDE OIL FILLER		
B-3	1	PAOZZ	2520-00-673-2973	19207	8350969	GAGE,ROD BREATHER PART OF KIT PN 8351025	EA	1
B-3	2	PAOZZ	5330-00-770-8078	19207	7708078	GASKET	EA	1
B-3	3	PAOZZ	2520-01-121-1223	19207	8350965	TUBE ASSEMBLY PART OF KIT PN 8351025	EA	1
B-3	4	PAOZZ	5330-00-102-3651	19207	8357269	GASKET PART OF KIT PN 8351025	EA	2
B-3	5	PAOZZ	2520-00-722-8878	19207	8348282	STRAINER ELEMENT,SEDIMENT PART OF KIT PN 8351025	EA	1
B-3	6	PAFZZ	4730-00-921-3242	96906	MS39158-7	ADAPTER,STRAIGHT PART OF KIT PN 8351025	EA	1
B-3	7	PAFZZ	4710-00-712-2989	19207	8350968	TUBE ASSEMBLY PART OF KIT PN 8351025	EA	1
B-3	8	PAOZZ	4730-00-776-7619	19207	10900456	CLAMP,HOSE PART OF KIT PN 8351025	EA	2
B-3	9	PAOZZ	4720-00-865-6025	19207	8351130	TUBING,NONMETAL PART OF KIT PN 835125	EA	1
B-3	10	PAFZZ	5330-00-770-8123	19207	7708123	SEAL,RUBBER PART OF KIT PN 8351025	EA	1
B-3		PAFZZ	2520-00-673-2972	19207	8351025	PARTS KIT,SIDE OIL FILLER	EA	1
B-3	1					GAGE ROD BREATHER	EA	1
B-3	3					TUBE ASSEMBLY	EA	1
B-3	4					GASKET	EA	2
B-3	5					STRAINER ELEMENT,SEDIMENT	EA	1
B-3	6					ADAPTER,STRAIGHT	EA	1
B-3	7					TUBE ASSEMBLY	EA	1
B-3	8					CLAMP,HOSE	EA	2
B-3	9					TUBING,NON-METAL	EA	1
B-3	10					SEAL,RUBBER	EA	1

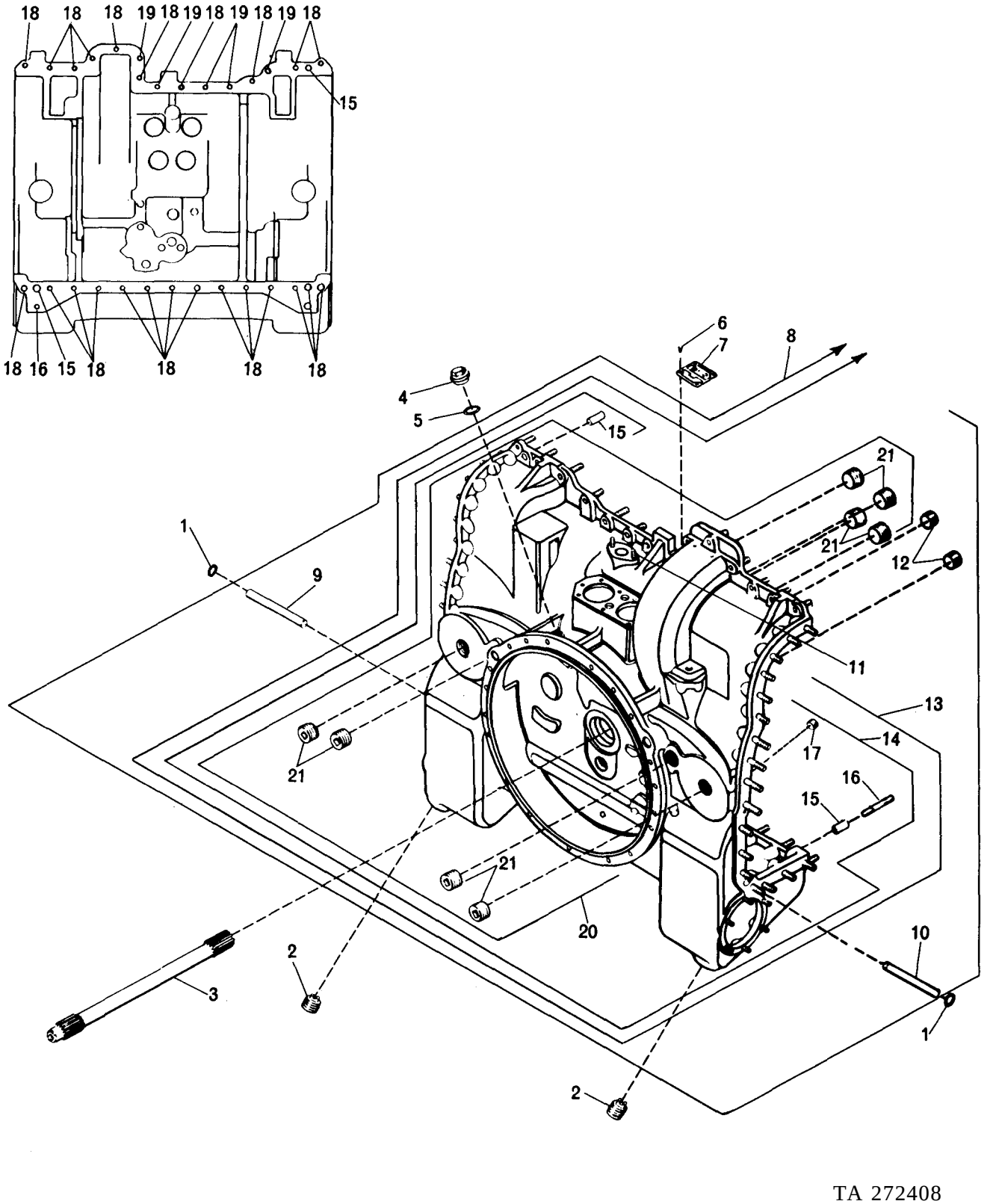


Figure B-4. Front and rear housing assembly (Sheet 1 of 2)

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0710 TRANSMISSION ASSEMBLY-- FRONT AND REAR HOUSING ASSEMBLY-- FIGURE 1 OF 2		
B-4	1	PAHZZ	5330-00-815-7994	19207	8350826	PACKING,PREFORMED	EA	2
B-4	2	PAOZZ	4730-00-287-3714	24617	444678	PLUG,PIPE	EA	2
B-4	3	PAHZZ	2520-00-777-6759	19207	8351088	SHAFT,STRAIGHT	EA	1
B-4	4	PAFZZ	5365-00-776-7855	19207	7767855	PLUG,MACHINE,THREADED	EA	1
B-4	5	PAFZZ	5330-00-776-7860	19207	7767860	GASKET	EA	1
B-4	6	PAFZZ	5305-00-253-5615	96906	MS21318-21	SCREW,DRIVE	EA	4
B-4	7	PAFZZ	9905-01-032-5057	19207	11650033	PLATE	EA	1
B-4	8	PAHDD	2520-00-133-9636	19207	8355833	HOUSING,MECHANICAL	EA	1
B-4	9	PBHZZ	2520-00-737-1931	19207	7371931	TUBE	EA	1
B-4	10	PAHZZ	2520-00-737-1932	19207	7371932	TUBE	EA	1
B-4	11	PAHZZ	5307-00-776-7768	19207	7767768	STUD,PLAIN STANDARD	EA	26
B-4	11	PAHZZ	5307-00-752-0614	19207	7520614	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	11	PAHZZ	5307-00-752-0615	19207	7520615	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	11	PAHZZ	5307-00-752-0616	19207	7520616	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	12	PAOZZ	4730-00-653-7073	19207	7707965	PLUG,PIPE	EA	1
B-4	13	XAHDD		19207	8355832	HOUSING ASSY	EA	1
B-4	14	XAHDD		19207	8355831	HOUSING ASSY	EEA	1
B-4	15	PAHZZ	5315-00-776-7862	19207	7767862	PIN,DOWEL	EA	2
B-4	16	PAHZZ		19207	7767858	STUD,PLAIN STANDARD	EA	1
B-4	16	PAHZZ	5307-00-699-6243	19207	7520649	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	16	PAHZZ	5307-00-699-6244	19207	7520650	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	16	PAHZZ	5307-00-699-6245	19207	7520651	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	17	PAHZZ	3805-00-847-6847	81240	444654	PLUG,PIPE	EEA	1
B-4	18	PAHZZ	5307-00-776-7579	19207	7767579	STUD,PLAIN STANDARD	EEA	25
B-4	18	PAHZZ	5307-00-737-8743	19207	7720605	STUD,PLAIN 0.003 OVERSIZE	EEA	V
B-4	18	PAHZZ	5307-00-699-6230	19207	7520606	STUD,PLAIN 0.006 OVERSIZE	EEA	V
B-4	18	PAHZZ	5307-00-699-6231	19207	7520607	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	19	PAHZZ	5307-01-143-9253	19207	8355812	STUD,PLAIN STANDARD	EA	4
B-4	19	PAHZZ		19207	8355814	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	19	PAHZZ		19207	8355815	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	19	PAHZZ	5307-00-978-6062	19207	8355813	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	20	XAHDD		19207	8355848	HOUSING	EA	1
B-4	21	PAHZZ	4730-00-776-7863	19207	7767863	PLUG,PIPE	EA	8

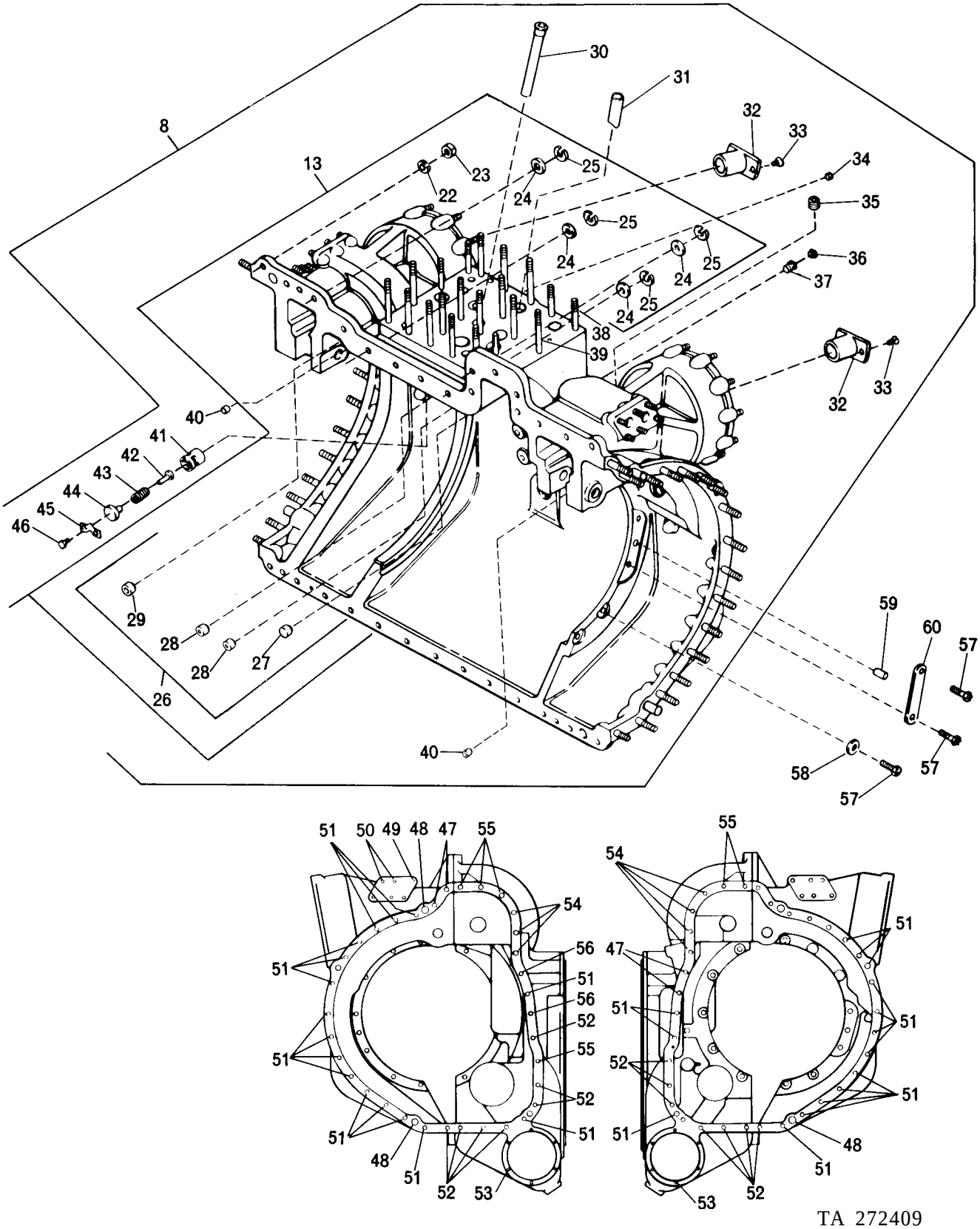


Figure B-4. Front and rear housing assembly (Sheet 2 of 2)

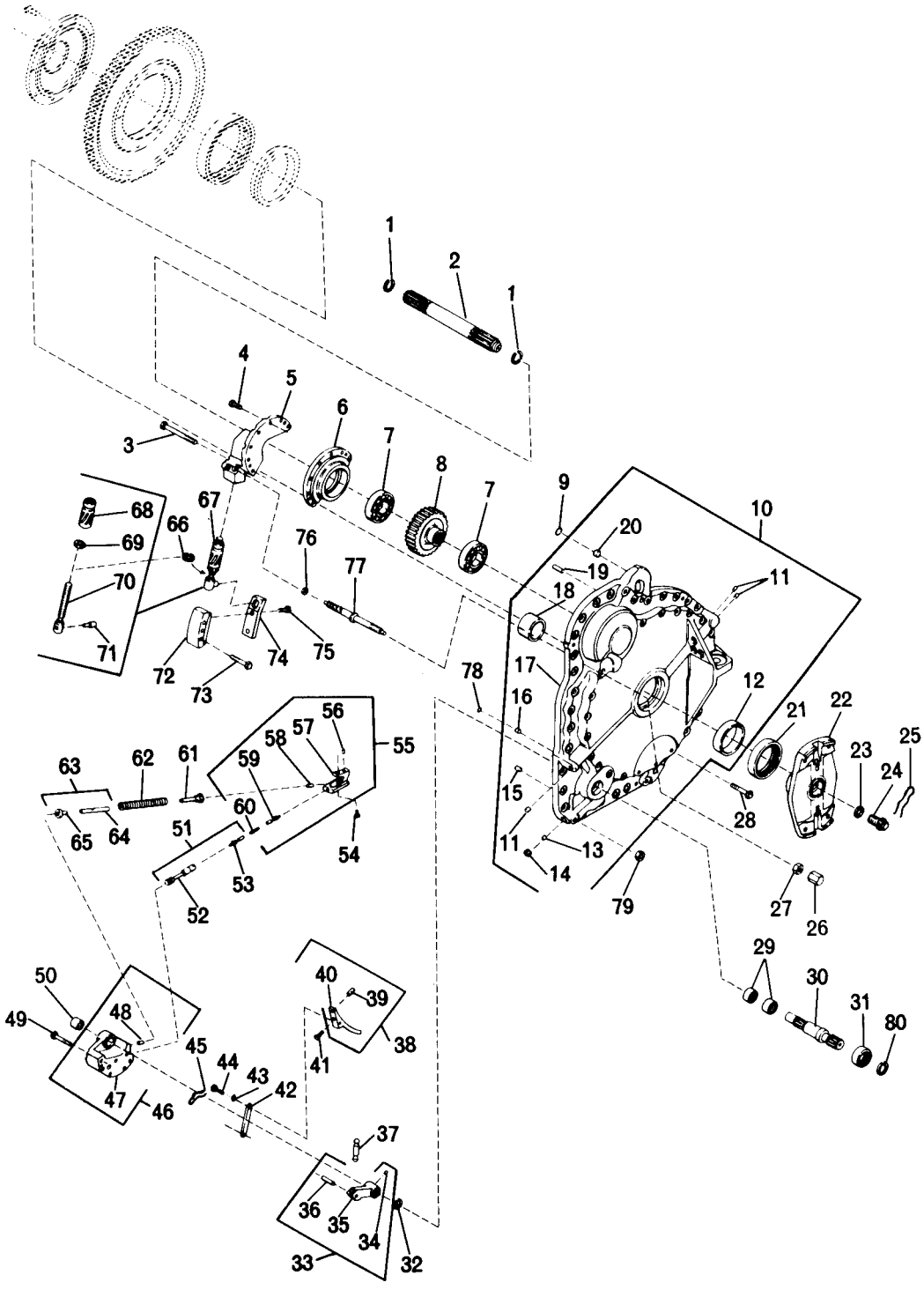
(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0710 TRANSMISSION ASSEMBLY-- FRONT AND REAR HOUSING ASSEMBLY-- FIGURE 2 OF 2		
B-4	22	PAHZZ	5310-00-809-5998	96906	MS27183-18	WASHER,PLAIN	EA	26
B-4	23	PAHZZ	5310-00-010-3028	96906	MS35690-824	NUT,PLAIN HEXAGON	EA	30
B-4	24	PAHZZ		19207	8355817	SPACER	EA	4
B-4	25	PAHZZ	5310-00-010-3323	96906	MS35338-10	WASHER,LOCK	EA	4
B-4	26	XAHDD		19207	8350657	HOUSING,REAR	EA	1
B-4	27	PADZZ	5935-00-687-2046	21450	7707854	CONNECTOR,PLUG	EA	1
B-4	28	PADZZ		19207	7707856	BUSHING	EA	2
B-4	29	PADZZ	3120-01-144-8850	19207	7707859	BUSHING	EA	V
B-4	30	PBHZZ	2520-00-776-7556	19207	7767556	TUBE	EA	1
B-4	31	PAHZZ		19207	7709870	TUBE	EA	1
B-4	32	PAHZZ	3120-00-776-8039	19207	7768039	BEARING,SLEEVE	EA	2
B-4	33	PAHZZ	5305-00-959-2723	96906	MS35237-118	SCREW,MACHINE	EA	4
B-4	34	PAOZZ	3805-00-847-6847	81240	444654	PLUG,PIPE	EA	1
B-4	35	PAOZZ	4730-00-653-7073	19207	7707965	PLUG,PIPE	EA	2
B-4	36	PAHZZ	5365-01-020-6297	96906	MS51990-109P	RING,LOCK,SERRATED	EA	6
B-4	37	PAHZZ	5340-00-753-9750	19207	7539750	INSERT,SCREW,THREAD	EA	6
B-4	38	PAHZZ	5307-00-776-7552	19207	7767552	STUD,PLAIN STANDARD	EA	4
B-4	38	PAHZZ	5307-00-752-0625	19207	7520625	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	38	PAHZZ	5307-00-752-0626	19207	7520626	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	38	PAHZZ	5307-00-752-0627	19207	7520627	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	39	PAHZZ		19207	7767553	STUD,PLAIN STANDARD	EA	18
B-4	39	PAHZZ	5307-00-752-0621	19207	7708709	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	39	PAHZZ		19207	7708710	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	39	PAHZZ		19207	7708711	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	40	PAHZZ		21450	8344581	PLUG,PIPE	EA	2
B-4	41	PAHZZ	2520-00-692-4913	19207	7709874	BODY	EA	1
B-4	42	PAHZZ	2520-00-692-4912	19207	7709873	VALVE	EA	1
B-4	43	PAHZZ	5360-00-321-6135	19207	7709872	SPRING,HELICAL,COMPRESSION	EA	1
B-4	44	PAHZZ	2520-00-692-4911	19207	7709871	RETAINER	EA	1
B-4	45	PBHZZ	5340-00-178-1403	19207	7709908	PLATE	EA	1
B-4	46	PAHZZ	5306-00-225-8496	96906	MS90725-31	SCREW,CAP,HEXAGON HEAD	EA	2
B-4	47	PAHZZ		19207	7707874	STUD,PLAIN STANDARD	EA	6
B-4	47	PAHZZ	5307-00-770-7875	19027	7707875	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	47	PAHZZ	5307-00-770-7876	19027	7707876	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	47	PAHZZ	5307-00-770-7877	19027	7707877	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	48	PAHZZ	5315-01-046-0851	19207	7767581	PIN,DOWEL	EA	4
B-4	49	PAHZZ		19207	7707818	STUD,PLAIN STANDARD	EA	8

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-4	49	PAHZZ	5307-00-770-7819	19207	7707819	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	49	PAHZZ	5307-00-770-7820	19207	7707820	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	49	PAHZZ	5307-00-770-7821	19207	7707821	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	50	PAHZZ	5307-01-143-9251	19207	8355713	STUD,PLAIN STANDARD	EA	4
B-4	50	PAHZZ	5307-00-064-3692	19207	8355714	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	50	PAHZZ		19207	8355715	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	50	PAHZZ	5307-01-144-8870	19207	8355716	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	51	PAHZZ	5307-00-776-7580	19207	7767580	STUD,PLAIN STANDARD	EA	33
B-4	51	PAHZZ	5307-00-752-0610	19207	7708697	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	51	PAHZZ		19207	7708698	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	51	PAHZZ		19207	7708699	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	52	PAHZZ	5307-00-776-7579	19207	7767579	STUD,PLAIN STANDARD	EA	14
B-4	52	PAHZZ	5307-00-737-8743	19207	7520605	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	52	PAHZZ	5307-00-699-6230	19027	7520606	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	52	PAHZZ	5307-00-699-6231	19207	7520607	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	53	PAHZZ		19207	7708683	STUD,PLAIN STANDARD	EA	6
B-4	53	PAHZZ	5307-00-752-0644	19207	7708716	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	53	PAHZZ	5307-00-752-0645	19207	7708717	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	53	PAHZZ	5307-00-752-0646	19207	7708718	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	54	PAHZZ		19207	7708182	STUD,PLAIN STANDARD	EA	7
B-4	54	PAHZZ	5307-00-637-0686	19207	7708183	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	54	PAHZZ	5307-00-567-4129	19207	7708184	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	54	PAHZZ	5307-00-637-9986	19207	7708185	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	55	PAHZZ	5307-01-145-1647	19207	8351108	STUD,PLAIN STANDARD	EA	6
B-4	55	PAHZZ	5307-00-826-5603	19207	8351109	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	55	PAHZZ		19207	8351110	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	55	PAHZZ	5307-01-144-8868	19207	8351111	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	56	PAHZZ	5307-01-143-9252	19207	8351104	STUD,PLAIN STANDARD	EA	2
B-4	56	PAHZZ	5307-00-826-2639	19207	8351105	STUD,PLAIN 0.003 OVERSIZE	EA	V
B-4	56	PAHZZ		19207	8351106	STUD,PLAIN 0.006 OVERSIZE	EA	V
B-4	56	PAHZZ	5307-01-144-8866	19207	8351107	STUD,PLAIN 0.009 OVERSIZE	EA	V
B-4	57	PAHZZ	5306-00-940-9060	96906	MS35764-669	BOLT,SELF-LOCKING	EA	12
B-4	58	PAHZZ	5310-00-492-6066	19207	8356205	WASHER,FLAT	EA	10
B-4	59	PAHZZ	5310-00-776-7723	19207	7767723	PIN	EA	1
B-4	60	PBHZZ	2520-00-776-7724	19207	7767724	PLATE	EA	1

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0710 TRANSMISSION ASSEMBLY-- RIGHT END COVER		
B-5	NI	PAHFF	2520-00-896-9022	19207	5703086	COVER ASSEMBLY AND CONTAINER	EA	1
B-5	1	PAFZZ	5365-00-776-8006	19207	7768006	RING,RETAINING	EA	1
B-5	2	PAFZZ	5310-00-010-3028	96906	MS35690-824	NUT,PLAIN HEXAGON	EA	34
B-5	3	PAHZZ	5365-00-776-7704	19207	7767704	RING,RETAINING	EA	2
B-5	4	PAHZZ	2520-00-776-7706	19207	7767706	SHAFT,SHOULDERED	EA	1
B-5	5	PBFDF	2520-00-333-3523	19207	8348319	COVER ASSEMBLY	EA	1
B-5	6	PAFZZ	3110-00-406-1540	19207	8350840	BEARING,BALL,ANNULAR	EA	2
B-5	7	PAFZZ	2520-00-776-7703	19207	7767703	GEAR	EA	1
B-5	8	PAFZZ	2530-00-776-7875	19207	7767875	SUPPORT,STEERING	EA	1
B-5	9	PAFZZ	2520-00-776-7736	19207	7767736	BRACKET,BRAKE ADJUSTING	EA	1
B-5	10	PAFZZ	5306-00-559-0484	96906	MS35764-636	BOLT,SELF-LOCKING	EA	6
B-5	11	PAFZZ	5305-00-269-4530	96906	MS35296-77	SCREW,CAP,HEXAGON HEAD	EA	1
B-5	12	PAFZZ	2520-00-776-7759	19207	7767759	BOLT ASSEMBLY	EA	1
B-5	13	XAFZZ		19207	7707686	GEAR	EA	1
B-5	14	XAFZZ		19207	7768060	WASHER	EA	1
B-5	15	XAFZZ		19207	7708685	BOLT	EA	1
B-5	16	XAFZZ		19207	7767891	PIN	EA	1
B-5	17	PAFZZ	5365-00-832-4666	96906	MS16625-137	RING,RETAINING	EA	1
B-5	18	PAFZZ	5306-01-066-3529	96906	MS35764-233	BOLT,SELF-LOCKING	EA	2
B-5	19	PAFZZ	2520-00-776-7896	19207	7767896	PLATE	EA	1
B-5	20	PAFZZ	5306-00-206-1314	19207	7709368	BOLT,SELF-LOCKING	EA	3
B-5	21	PAFZZ	2520-00-776-7752	19207	7767752	BLOCK	EA	1
B-5	22	PAFZZ	5310-00-776-8062	19207	7768062	WASHER,FLAT,PLAIN	EA	1
B-5	23	PAFZZ	2520-00-776-8063	19207	7768063	WORM SHAFT	EA	1
B-5	24	PAFZZ		19207	22W1631-110	WIRE,LOCK	EA	V
B-5	25	PAFZZ	5305-00-776-7630	19207	7767630	SCREW,HEXAGON HEA	EA	1
B-5	26	PAFZZ	5310-00-776-7631	19207	7767631	WASHER,FLAT	EA	1
B-5	27	PAFZZ	2520-00-776-7629	19207	7767629	BEARING,WASHER,THRUST	EA	1
B-5	28	PAFZZ	5330-00-770-7245	19207	7707245	SEAL,PLAIN ENCASED	EA	1
B-5	29	PAFZZ	5306-00-940-9041	21450	9409041	BOLT,SELF-LOCKING	EA	21
B-5	30	XAHDD		19207	7709402	COVER ASSY	EA	1
B-5	31	PAHZZ	5365-01-040-5253	19207	7709713	SPACER,SLEEVE	EA	1
B-5	32	PAHZZ	5315-00-014-1247	21450	141247	PIN,DOWEL	EA	2
B-5	33	KDDZZ	3120-00-776-7680	19207	7767680	BEARING,SLEEVE PART OF KIT PN 7708527	EA	1
B-5	34	PAHZZ	5365-01-045-0527	19207	8347301	SPACER,SLEEVE	EA	1
B-5	35	PAFZZ	5315-00-014-1260	21450	141260	PIN,STRAIGHT,HEADLESS	EA	2
B-5	36	PBFZZ	4730-00-410-6087	31007	445751	PLUG,PIPE	EA	1
B-5	37	PBFZZ	2520-01-037-6880	19207	7709399	PLUG,METALLIC	EA	1

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-5	38	XADZZ		19207	7709395	COVER	EA	1
B-5	39	PAFZZ	5340-00-012-5647	21450	125647	PLUG	EA	3
B-5	40	KDDZZ	3120-00-776-7679	19207	7767679	BUSHING,SLEEVE PART OF KIT PN 7708527	EA	1
B-5	41	PAFZZ	5330-00-291-2438	19207	8347639	PACKING,PREFORMED	EA	1
B-5	42	PAFZZ	5330-00-579-8108	73342	7767758	PACKING,PREFORMED	EA	1
B-5	43	PAFZZ	2520-00-770-8099	19207	7708099	BRACKET ASSY	EA	1
B-5	44	XAFZZ		19207	7767886	PIN	EA	1
B-5	45	XAFZZ		19207	7707834	BRACKET	EA	1
B-5	46	XAFZZ		19207	7767892	PIN	EA	1
B-5	47	XAFZZ		19207	7767908	BALL JOINT	EA	1
B-5	48	PAFZZ	5306-00-292-4590	19207	7767910	BOLT,SELF-LOCKING	EA	1
B-5	49	PBFZZ	2520-00-337-6918	19207	7709549	VALVE ASSY	EA	1
B-5	50	XAFZZ		19207	7709538	VALVE	EA	1
B-5	51	XAFZZ		19207	7767908	BALL JOINT	EA	2
B-5	52	XAFZZ		19207	7768058	ROD,STUD	EA	1
B-5	53	PAFZZ	2520-00-776-7889	19207	7767889	PIN	EA	1
B-5	54	PAFZZ	5360-00-776-8000	19207	7768000	SPRING,HELICAL,COMPRESSION	EA	1
B-5	55	PAFZZ	2530-00-734-8761	19207	7348761	SEAT ASSY	EA	1
B-5	56	XAFZZ		19207	7768004	SEAT	EA	1
B-5	57	XAFZZ		19207	7767881	GUIDE	EA	1
B-5	58	PAFZZ	3110-00-227-2159	96906	MS17131-27	BEARING,ROLLER,NEEDLE	EA	1
B-5	59	PAFZZ	5306-00-292-4590	21450	9409042	BOLT,SELF-LOCKING	EA	5
B-5	60	PBFFF	2530-00-337-6925	19207	7709631	BRACKET ASSY,RIGHT	EA	1
B-5	61	XAFZZ		19207	7709630	BRACKET	EA	1
B-5	62	XAFZZ		19207	7767892	PIN	EA	1
B-5	63	PAFZZ	5306-00-737-3457	19207	7373457	BOLT,SHOULDERED	EA	1
B-5	64	PAFZZ	2520-00-073-5412	80244	22W1630	WIRE	EA	V
B-5	65	PAFZZ	5310-00-737-6765	19207	7376765	WASHER,SPRING,WAVE	EA	1
B-5	66	PAFZZ	2520-00-737-3456	19207	7373456	RETAINER	EA	1
B-5	67	PAFFF	2520-00-754-0473	19207	7540473	LEVER ASSY	EA	1
B-5	68	XAFZZ		19207	7994000	LEVER	EA	1
B-5	69	PAFZZ	5315-00-737-3455	19207	7373455	PIN,STRAIGHT,HEADLESS	EA	1
B-5	70	PAFZZ	5315-00-276-0092	88044	141149	PIN,STRAIGHT,HEADLESS	EA	1
B-5	71	PAFZZ	2520-00-776-8057	19207	7768057	STRUT	EA	1
B-5	72	PAFZZ	5365-00-770-7326	19207	7707326	RING,RETANING	EA	1
B-5	73	PAFZZ	5306-00-022-1950	96906	MS35764-632	BOLT,SELF-LOCKING	EA	3
B-5	74	PBFZZ	2530-01-043-5333	19207	7708922	BRACKET ASSY	EA	1
B-5	75	XAFZZ		19207	7324014	BRACKET CAM RING	EA	1
B-5	76	XAFZZ		19207	7767888	PIN	EA	1

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-5	77	PAFZZ	3110-00-902-3772	60380	B1812	BEARING,ROLLER,NEEDLE		EA	2
B-5	78	PAFZZ	2520-00-770-7325	19207	7707325	SHAFT,SHOULDERED		EA	1
B-5	79	PAFZZ	5330-01-075-7852	19207	7707246	SEAL,PLAIN,ENCASED		EA	1
B-5	80	PAOZZ	5310-00-776-7880	19207	7767880	NUT,SLEEVE		EA	1
B-5	81	PAOZZ	5310-00-897-6080	96906	MS35691-27	NUT,PLAIN,HEXAGON		EA	1
B-5		PADZZ	2520-00-039-7689	19207	7708527	PARTS KIT,BUSHING		EA	V
B-5	33					BEARING,SLEEVE		EA	1
B-5	40					BEARING,SLEEVE		EA	1



TA 272411

Figure B-6. Left end cover

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0710 TRANSMISSION ASSEMBLY-- LEFT END COVER		
B-6	NI	PAHFF	2520-00-896-9023	19207	5703087	COVER ASSEMBY AND CONTAINER	EA	1
B-6	1	PAHZZ	5365-00-776-7704	19207	7767704	RING,RETAINING	EA	2
B-6	2	PAHZZ	2520-00-776-7874	19207	7767874	SHAFT,SHOULDERED	EA	1
B-6	3	PAFZZ	5305-00-269-4530	96906	MS35296-77	SCREW,CAP,HEXAGON HEAD	EA	1
B-6	4	PAFZZ	5306-00-559-0484	96906	MS35764-636	BOLT,SELF-LOCKING	EA	6
B-6	5	PBFZZ	2520-00-776-7882	19207	7767882	BRACKET,BRAKE ADJUSTING	EA	1
B-6	6	PAFZZ	2530-00-776-7875	19207	7767875	SUPPORT,STEERING	EA	1
B-6	7	PAFZZ	3110-00-406-1540	19207	8350840	BEARING,BALL,ANNULAR	EA	2
B-6	8	PAFZZ	2520-00-776-7703	19207	7767703	GEAR	EA	1
B-6	9	PAFZZ	5330-00-291-2438	19207	8347639	PACKING,PREFORMED	EA	1
B-6	10	XAHDD	2520-01-138-7070	19207	7709403	COVER ASSY	EA	1
B-6	11	PAFZZ	5340-00-012-5647	21450	125647	PLUG	EA	3
B-6	12	KDDZZ	3120-00-776-7679	19207	7767679	BEARING,SLEEVE PART OF KIT PN 7708527	EA	1
B-6	13	PBFZZ	2520-01-037-6880	19207	7709399	PLUG,METALLIC	EA	1
B-6	14	PBFZZ	4730-00-410-6087	31007	445751	PLUG,PIPE	EA	1
B-6	15	PAFZZ	5315-00-014-1260	21450	141260	PIN,STRAIGHT,HEADLESS	EA	2
B-6	16	PAHZZ	5365-01-045-0527	19207	8347301	SPACER,SLEEVE	EA	1
B-6	17	XADZZ		19207	7709394	COVER	EA	1
B-6	18	KDDZZ	3120-00-776-7680	19207	7767680	BEARING,SLEEVE PART OF KIT PN 7708527	EA	1
B-6	19	PAHZZ	5315-00-014-1247	21450	141247	PIN,STRAIGHT,HEADLESS	EA	2
B-6	20	PAHZZ	5365-01-040-5253	19207	7709713	SPACER,SLEEVE	EA	1
B-6	21	PAFZZ	5330-00-770-7245	19207	7707245	SEAL,PLAIN ENCASED	EA	1
B-6	22	PAFZZ	2520-00-776-7629	19207	7767629	BEARING,WASHER,THRUST	EA	1
B-6	23	PAFZZ	5310-00-776-7631	19207	7767631	WASHER,FLAT	EA	1
B-6	24	PAFZZ	5305-00-776-7630	19207	7767630	SCREW	EA	1
B-6	25	PAFZZ		19207	22W1631-110	WIRE,LOCK	EA	V
B-6	26	PAOZZ	5310-00-776-7880	19207	7767880	NUT,SLEEVE	EA	1
B-6	27	PAOZZ	5310-00-897-6080	96906	MS35691-27	NUT,PLAIN,HEXAGON	EA	1
B-6	28	PAFZZ	5306-00-940-9041	21450	9409041	BOLT,SELF-LOCKING	EA	21
B-6	29	PAFZZ	3110-00-902-3772	60380	B18126	BEARING,ROLLER,NEEDLE	EA	2
B-6	30	PAFZZ	2520-00-770-7325	19207	7707325	SHAFT,SHOLDERED	EA	1
B-6	31	PAFZZ	5330-01-075-7852	19207	7707246	SEAL,PLAIN,ENCASED	EA	1
B-6	32	PAFZZ	5365-00-770-7326	19207	7707326	RING,RETAINING	EA	1
B-6	33	PAFFF	2520-00-754-0472	19207	7540472	LEVER	EA	1
B-6	34	PAFZZ	5315-00-276-0092	24617	141149	PIN,STRAIGHT,HEADLESS	EA	1
B-6	35	XAFZZ		19207	7980318	LEVER	EA	1
B-6	36	PAFZZ	5315-00-737-3455	19207	7373455	PIN,STRAIGHT,HEADLESS	EA	1
B-6	37	PAFZZ	2520-00-776-8057	19207	7768057	STRUT	EA	1

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-6	38	PBFZZ	2530-01-043-5333	19207	7708922	BRACKET ASSEMBLY		EA	1
B-6	39	XAFZZ		19207	7767888	PIN		EA	1
B-6	40		2520-00-732-4014	19207	7324014	BRACKET CAM RING		EA	1
B-6	41	PAFZZ	5306-00-022-1950	96906	MS35764-632	BOLT,SELF-LOCKING		EA	3
B-6	42	PAFZZ	2520-00-737-3456	19207	7373456	RETAINER		EA	1
B-6	43	PAFZZ	5310-00-737-6765	19207	7376765	WASHER,SPRING,WAVE		EA	1
B-6	44	PAFZZ	5306-00-737-3457	19207	7373457	BOLT,SHOULDERED		EA	1
B-6	45	PAFZZ	2520-00-073-5412	80244	22W1630	WIRE		EA	V
B-6	46	PBFZZ	2530-00-337-6924	19207	7709629	BRACKET ASSY,LEFT		EA	1
B-6	47	XAFZZ		19207	7709628	BRACKET		EA	1
B-6	48	XAFZZ		19207	7767892	PIN		EA	1
B-6	49	PAFZZ	5306-00-292-4590	24617	9409042	BOLT,SELF-LOCKING		EA	5
B-6	50	PAFZZ	3110-00-227-2159	96906	MS17131-27	BEARING,ROLLER,NEEDLE		EA	1
B-6	51	PBFZZ	2520-00-337-6918	19207	7709549	VALVE ASSEMBLY		EA	1
B-6	52	XAFZZ		19207	7709538	VALVE		EA	1
B-6	53	XAFZZ		19207	7767908	BALL JOINT		EA	1
B-6	54	PAFZZ	5306-00-292-4590	19207	7767910	BOLT,SELF-LOCKING		EA	1
B-6	55	PAFZZ	2520-00-770-8099	19207	7708099	BRACKET ASSEMBLY		EA	1
B-6	56	XAFZZ		19207	7767886	PIN		EA	1
B-6	57	XAFZZ		19207	7707834	BRACKET		EA	1
B-6	58	XAFZZ		19207	7767892	PIN		EA	1
B-6	59	XAFZZ		19207	7767908	BALL JOINT		EA	1
B-6	60	XAFZZ		19207	7768058	ROD,STUD		EA	1
B-6	61	PAFZZ	2520-00-776-7889	19207	7767889	PIN		EA	1
B-6	62	PAFZZ	5360-00-776-8000	19207	7768000	SPRING,HELICAL,COMPRESSION		EA	1
B-6	63	PAFZZ	2530-00-734-8761	19207	7348761	SEAT ASSY		EA	1
B-6	64	XAFZZ		19207	7767881	GUIDE		EA	1
B-6	65	XAFZZ		19207	7768004	SEAT		EA	1
B-6	66	PAFZZ	5365-00-832-4666	96906	MS16625-137	RING,RETAINING		EA	1
B-6	67	PAFZZ	2520-00-776-7759	19207	7767759	BOLT ASSEMBLY		EA	1
B-6	68	XAFZZ		19207	7707686	GEAR		EA	1
B-6	69	XAFZZ		19207	7768060	WASHER		EA	1
B-6	70	XAFZZ		19207	7708685	BOLT		EA	1
B-6	71	XAFZZ		19207	7767891	PIN		EA	1
B-6	72	PAFZZ	2520-00-776-7752	19207	7767752	BLOCK		EA	1
B-6	73	PAFZZ	5306-00-206-1314	19207	7709368	BOLT,SELF-LOCKING		EA	3
B-6	74	PAFZZ	2520-00-776-7896	19207	7767896	PLATE		EA	1
B-6	75	PAFZZ	5306-01-066-3529	96906	MS35764-233	BOLT,SELF-LOCKING		EA	2
B-6	76	PAFZZ	5310-00-776-8062	19207	7768062	WASHER,FLAT		EA	1

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-6	77	PAFZZ	2520-00-776-8063	79207	7768063	WORM SHAFT		EA	1
B-6	78	PAFZZ	5330-00-579-8108	73342	7767758	PACKING,PREFORMED		EA	1
B-6	79	PAFZZ	5310-00-010-3028	96906	MS35690-824	NUT,PLAIN,HEXAGON		EA	34
B-6	80	PAFZZ	5365-00-776-8006	19207	7768006	RING,RETAINING		EA	1
B-6		PADZZ	2520-00-039-7689	19207	7708527	PART KIT BUSHING		EA	V
B-6	12					BEARING,SLEEVE		EA	1
B-6	18					BEARING,SLEEVE		EA	1

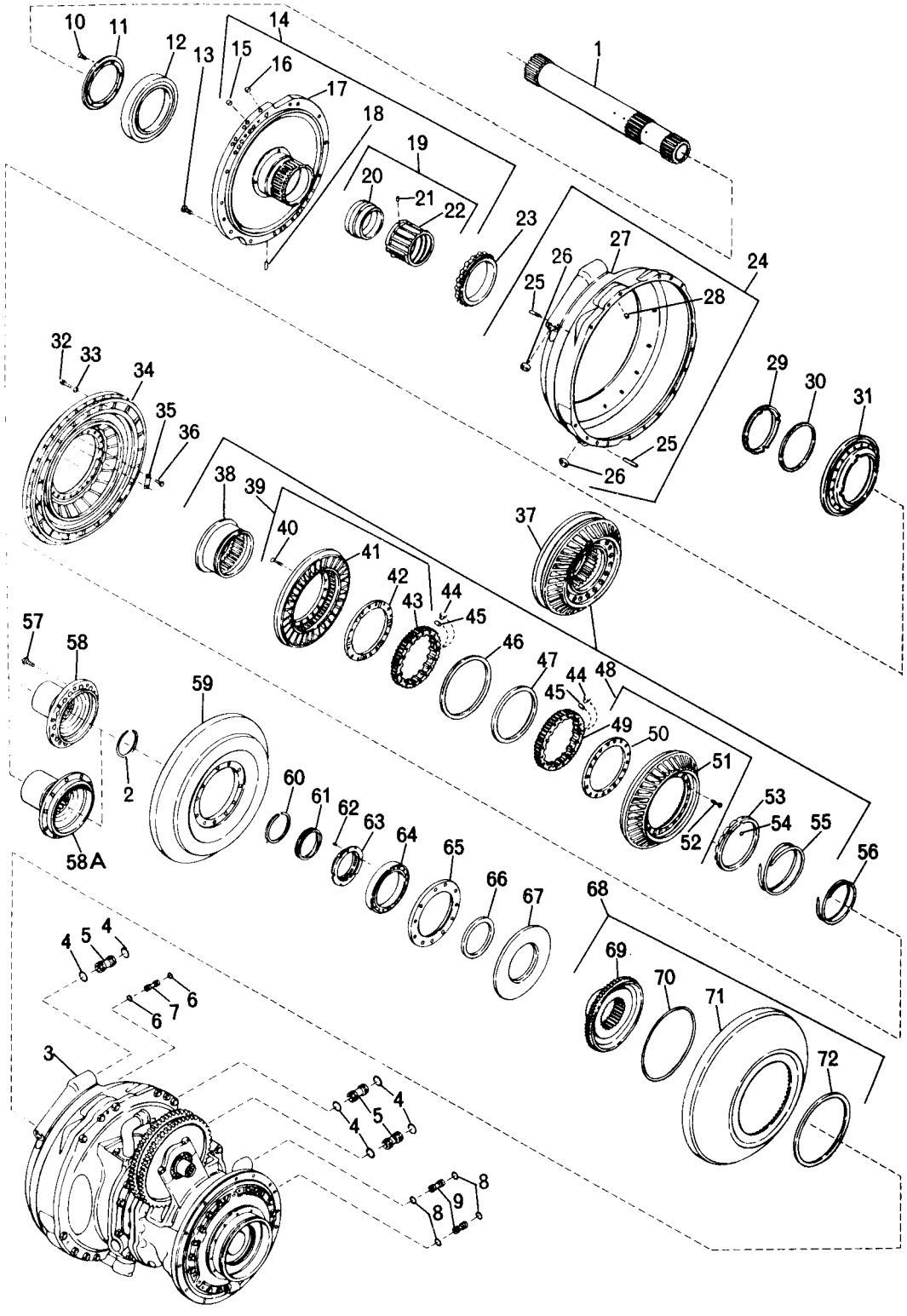


Figure B-7. Input package assembly

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0710 TRANSMISSION ASSEMBLY-- INPUT PACKAGE ASSEMBLY		
B-7	1	PAHZZ	2520-00-753-9856	19207	7539856	SHAFT	EA	1
B-7	2	PAHZZ	5365-00-776-7715	19207	7707664	RING,RETAINING	EA	1
B-7	3	XAHHH		19207	8350530	UNIT ASSEMBLY USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-7	3	XAHHH		19207	11650107	UNIT ASSEMBLY USED WITH OIL PUMPS PN 23014066 AND 23014082	EA	1
B-7	4	PAHZZ	5330-00-752-1413	19207	7521413	PACKING,PREFORMED	EA	6
B-7	5	PAHZZ	2520-00-752-1427	24617	7521427	TUBE	EA	3
B-7	6	PAHZZ	5330-00-579-8108	19207	7767758	PACKING,PREFORMED	EA	2
B-7	7	PAHZZ	2520-00-752-1426	24617	7521426	TUBE	EA	1
B-7	8	PAHZZ	5330-00-752-1420	19207	7521420	PACKING,PREFORMED	EA	4
B-7	9	PAHZZ	2520-00-752-1460	24617	7521460	TUBE	EA	2
B-7	10	PAHZZ	5305-00-984-7353	96906	MS35191-306	SCREW,MACHINE	EA	8
B-7	11	PAHZZ	3110-00-776-7639	19207	7767639	PLATE,RETANING	EA	1
B-7	12	PAHZZ	3110-00-406-1538	19207	8350837	BEARING,ROLLER,CYLINDRICAL	EA	1
B-7	13	PAHZZ	5306-01-066-3529	96906	MS35764-233	BOLT,SELF-LOCKING	EA	14
B-7	14	PAHDD	2520-00-770-8121	19207	7708121	PLATE ASSY,STATOR	EA	1
B-7	15	XAHZZ		19207	8350827	PIN	EA	1
B-7	16	PAHZZ	2520-01-006-9622	19207	7707730	PLUG,EXPANSION	EA	8
B-7	17	XAHZZ		19207	7708101	PLATE	EA	1
B-7	18	PADZZ	5315-00-010-3726	21450	103726	PIN,STRAIGHT,HEADLESS	EA	1
B-7	19	PADDD	2520-00-092-9296	19207	7709396	BUSHING ASSEMBLY	EA	1
B-7	20	XADZZ		19207	7707836	SLEEVE	EA	1
B-7	21	PADZZ	5315-01-023-3881	24617	141107	PIN,STRAIGHT,HEADLESS	EA	2
B-7	22	XADZZ		19207	7709391	BUSHING	EA	1
B-7	23	PAHZZ	3110-00-185-0139	19207	8350839	BEARING,ROLLER,CYLINDRICAL	EA	1
B-7	24	PAHHH	2520-00-776-7664	19207	7767664	HOUSING ASSEMBLY	EA	1
B-7	25	PAHZZ	5315-00-010-3731	21450	103731	PIN,STRAIGHT,HEADLESS	EA	2
B-7	26	PBHZZ	5340-01-044-2674	19207	7767750	PLUG,EXPANSION	EA	2
B-7	27	XAHZZ		19207	7708652	HOUSING	EA	1
B-7	28	XAHZZ		19207	8350827	PIN	EA	1
B-7	29	PAHZZ	2520-00-886-1206	19207	8352004	RING,OIL SEAL	EA	1
B-7	30	PAHZZ	2520-00-753-9754	19207	7539754	SEAL RING,METAL	EA	1
B-7	31	PAHZZ	2520-00-886-1207	19207	8351988	HUB,PUMP,TORQUE CONVERTER	EA	1
B-7	32	PAHZZ	5306-01-137-9712	96906	MS35764-635	BOLT,SELF-LOCKING	EA	40
B-7	33	PAHZZ	5310-00-776-7670	19207	7767670	WASHER,FLAT	EA	40
B-7	34	PAHZZ	2520-00-679-4497	19207	8350564	PUMP,TORQUE CONVERTER	EA	1
B-7	35	PAHZZ	2520-00-776-7743	19207	7767743	PLATE	EA	12
B-7	36	PAHZZ	5306-00-292-4586	24617	9409009	BOLT,SELF-LOCKING	EA	24

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-7	37	PAHHH	2520-00-323-8530	19207	7710822	STATOR ASSEMBLY	EA	1
B-7	38	PAHZZ	2520-00-770-8114	19207	7708114	RACE WHEEL,ROLLER	EA	1
B-7	39	PBHHH	2520-00-737-3561	19207	7373561	STATOR,TRANSMISSION	EA	1
B-7	40	PAHZZ	5305-00-776-7655	19207	7767655	SCREW,CAP,SOCKET	EA	18
B-7	41	PBHZZ	2520-01-040-4992	19207	7065811	STATOR,TORQUE,CONVERTER	EA	1
B-7	42	PAHZZ	3120-00-776-7770	19207	7767770	WASHER,STATOR,THRUST	EA	1
B-7	43	PAHZZ	2520-00-776-7654	19207	7767654	CAM	EA	1
B-7	44	PAHZZ	3110-00-227-3982	19207	8376257	ROLLER,BEARING	EA	36
B-7	45	PAHZZ	5360-00-752-1423	19207	7521423	SPRING,HELICAL,COMPRESSION	EA	36
B-7	46	PAHZZ	5365-00-178-6598	19207	7710782	SPACER,RING	EA	1
B-7	47	PAHZZ	5365-00-800-2844	19207	7710783	SPACER,RING	EA	1
B-7	48	PBHHH	2520-01-050-3064	19207	7707884	STATOR,TORQUE CONVERTER	EA	1
B-7	49	PAHZZ	2520-00-776-7654	19207	7767654	CAM	EA	1
B-7	50	PAHZZ	3120-00-776-7769	19207	7767769	BEARING,WASHER,THRUST	EA	1
B-7	51	PAHZZ	2520-00-770-7683	24617	7707683	STATOR,TORQUE CONVERTER	EA	1
B-7	52	PAHZZ	5305-00-776-7655	19207	7767655	SCREW,CAP,SOCKET	EA	18
B-7	53	PAHZZ	2520-00-955-5506	19207	7710786	WASHER,THRUST	EA	1
B-7	54	PAHZZ		96906	MS19059-86	BALL,BEARING	EA	1
B-7	55	PAHZZ	5365-00-770-8104	19207	7708104	RING,RETAINING	EA	1
B-7	56	PAHZZ	5365-00-770-8117	19207	7708117	RING,RETAINING	EA	1
B-7	57	PAHZZ	5306-00-752-1457	19207	7521457	BOLT,SELF-LOCKING	EA	11
B-7	58	PAHZZ	2520-00-770-7685	24617	7707685	FLANGE,TRANSMISSION USED WITH TURBINE PN 7767775 AND 11650010	EA	1
B-7	58A	PAHZZ	3010-01-146-7210	24617	11650042	FLANGE,TRANSMISSION USED WITH TURBINE PN 11650010	EA	1
B-7	59	PAHZZ	2520-01-019-0798	19207	11650010	TURBINE,TURQUE USED ON SN 45153 AND LATER	EA	1
B-7	59	PAHZZ	2520-00-776-7775	19207	7767775	TURBINE,TORQUE USED ON SN 45152 AND PRIOR	EA	1
B-7	60	PAHZZ	2520-00-770-7682	19207	7707682	SEAL RING,METAL	EA	1
B-7	61	PAHZZ	2520-00-653-9519	19207	8350569	SLEEVE,CONVERTER	EA	1
B-7	62	PAHZZ	5305-00-905-3044	96906	MS51976-47	SETSCREW	EA	1
B-7	63	PAHZZ	5310-00-776-7668	19207	7767668	NUT,PLAIN,ROUND	EA	1
B-7	64	PAHZZ	3110-00-155-8992	19207	8350525	BEARING,BALL,ANNULAR	EA	1
B-7	65	PAHZZ	3110-00-569-0012	19207	7767746	PLATE,RETAINING	EA	1
B-7	66	PAHZZ	5365-00-776-7771	19207	7767771	SPACER	EA	1
B-7	67	PAHZZ	5310-00-174-7429	19207	7767773	WASHER,SPRING THRUST	EA	1
B-7	68	PAHHH	2520-00-784-9294	19207	8350580	COVER ASSMEBLY	EA	1
B-7	69	PBHZZ	2520-00-431-3408	19207	8350565	HUB,TURBINE COVER	EA	1
B-7	70	PAHZZ	5330-00-776-7747	19207	7767747	PACKING,PREFORMED	EA	1
B-7	71	XAHZZ		19207	7708040	COVER	EA	1
B-7	72	PAHZZ	5365-00-776-7716	19207	7767716	SPACER,RING	EA	1

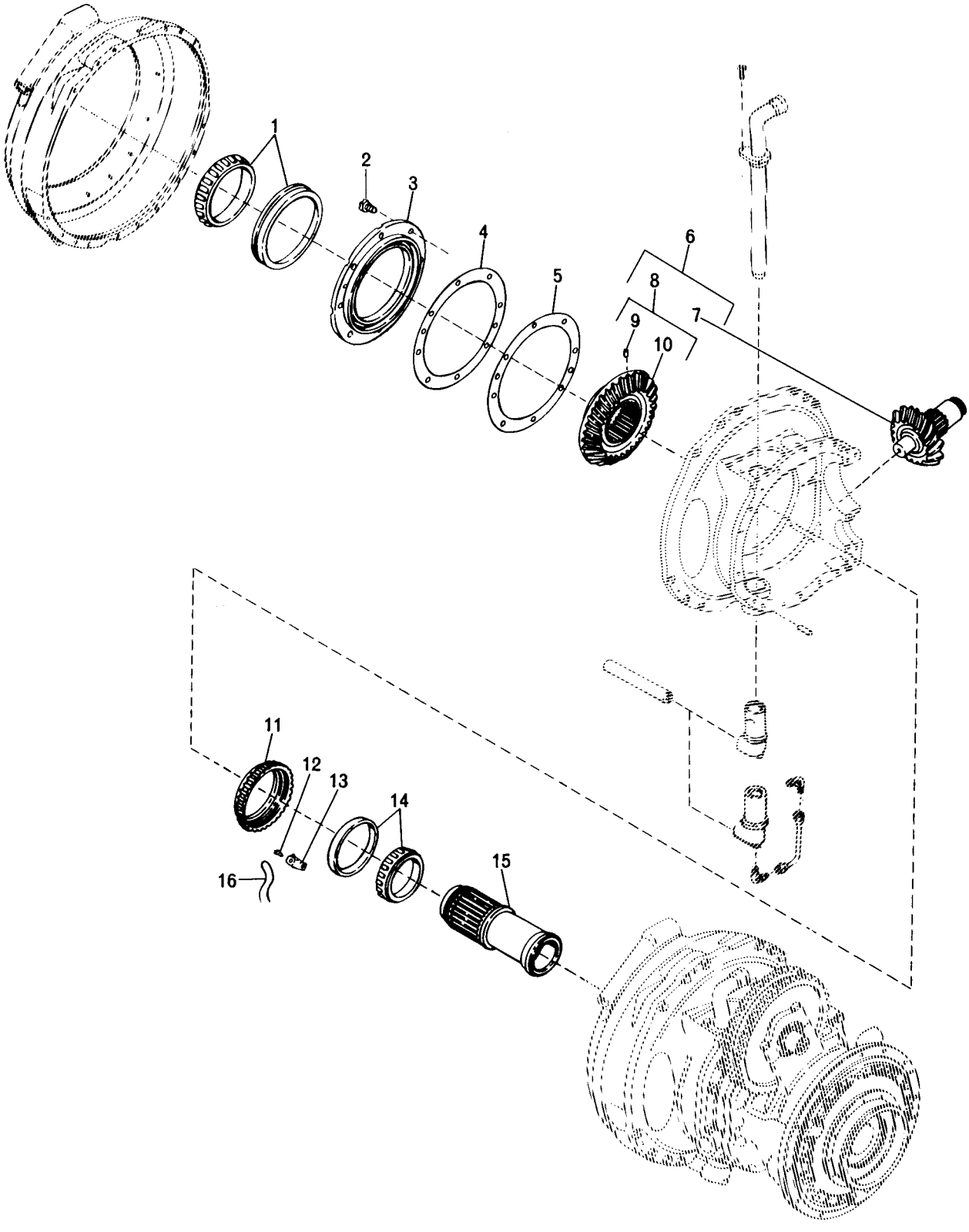


Figure B-8. Bevel gears

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0710 TRANSMISSION ASSEMBLY-- BEVEL GEARS		
B-8	1	PAHZZ	3110-01-049-4829	19207	8350524	BEARING,ROLLER,TAPERED	EA	1
B-8	2	PAHZZ	5306-00-940-9052	19207	9409052	BOLT,SELF-LOCKING	EA	8
B-8	3	PBHZZ	2520-00-776-7800	19207	7767800	RETAINER	EA	1
B-8	4	PAHZZ	5365-00-770-7848	19207	7707848	SHIM	EA	V
B-8	5	PAHZZ	5365-00-770-7849	19207	7707849	SHIM	EA	V
B-8	6	PAHHH	3020-00-323-8531	19207	7710834	GEAR SET,BEVEL,MATCHED	EA	1
B-8	7	XBHZZ		19207	7707878	GEAR	EA	1
B-8	8	XBHZZ		19207	7710833	GEAR ASSY	EA	1
B-8	9	PBHZZ	2520-01-045-3833	19207	7767777	JET,INPUT	EA	1
B-8	10	XAHZZ		19207	7710831	GEAR	EA	1
B-8	11	PAHZZ	5310-00-776-7667	19207	7767667	NUT,PLAIN,ROUND	EA	1
B-8	12	PAHZZ	5306-00-292-4585	24617	9409007	BOLT,SELF-LOCKING	EA	2
B-8	13	PAHZZ	2520-00-776-7666	19207	7767666	LOCK	EA	1
B-8	14	PAHZZ	3110-00-195-0454	19207	8350526	BEARING,ROLLER,TAPERED	EA	1
B-8	15	PAHZZ	2520-00-653-9518	19207	8350566	SHAFT,TORQUE CONVERTER	EA	1
B-8	16	PAHZZ	2520-00-073-5412	80244	22W1630	WIRE,LOCKING	EA	V

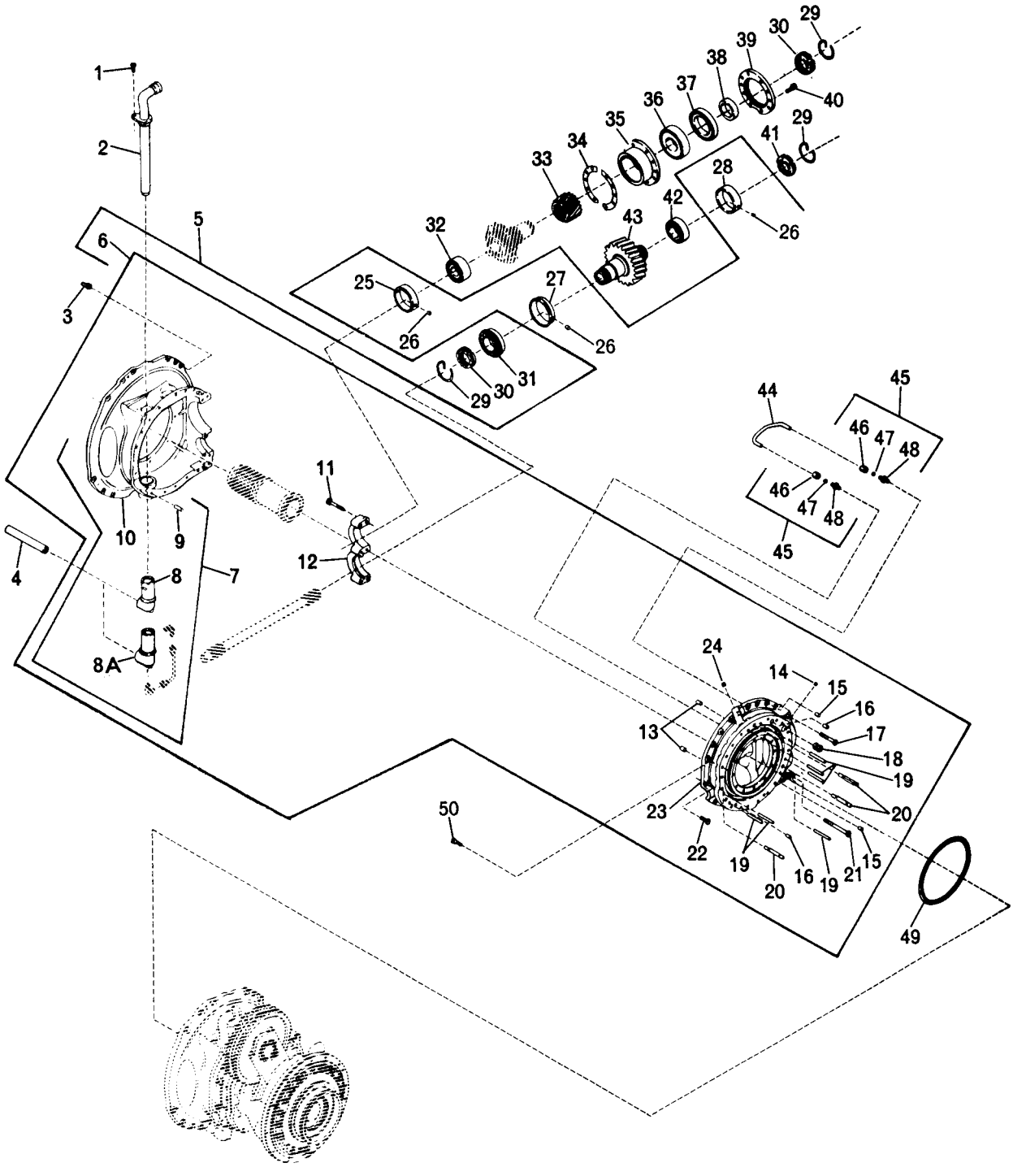


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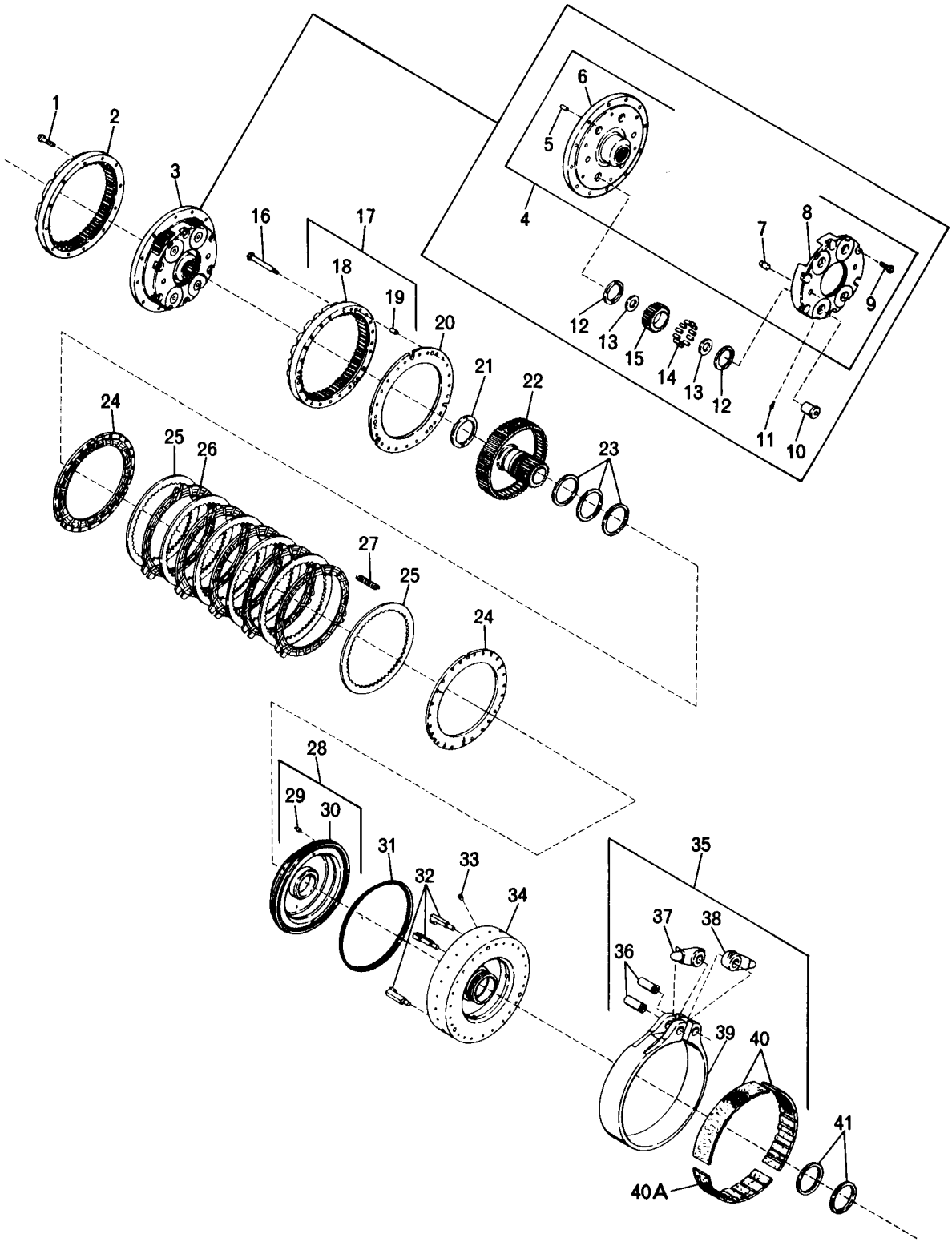
Figure B-9. Gears and carrier assembly

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0710 TRANSMISSION ASSEMBLY-- GEARS AND CARRIER ASSEMBLY		
B-9	1	PAHZZ	5306-00-899-4486	96906	MS35764-232	BOLT,SELF-LOCKING	EA	1
B-9	2	PAHZZ	4710-01-040-5299	19207	8356138	TUBE ASSEMBLY,METAL	EA	1
B-9	3	PAHZZ	5306-01-066-3529	96906	MS35764-233	BOLT,SELF-LOCKING	EA	16
B-9	4	PAHZZ	2520-00-776-7994	19207	7767994	TUBE	EA	1
B-9	5	PBHDD	2520-01-076-3757	19207	7710933	CARRIER ASSEMBLY USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-9	5	PBHDD		19207	11650137	CARRIER ASSEMBLY USED WITH OIL PUMPS PN 23014066 AND 23014082	EA EA	1 1
B-9	6	XBHDD		19207	8355736	CARRIER ASSY USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-9	6	XBHDD		19207	11650136	CARRIER ASSY USED WITH OIL PUMPS PN 23014066 AND 23014082	EA	1
B-9	7	XBHDD		19207	7710934	CARRIER ASSY USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-9	7	XBHDD		19207	11650135	CARRIER ASSY USED WITH OIL PUMPS PN 23014066 AND 23014082	EA	1
B-9	8	XBDZZ		19207	7707676	ELBOW USED WITH PUMPS PN 11649924 AND 7707909	EA	1
B-9	8A	XBDZZ		19207	11650081	ELBOW USED WITH OIL PUMPS PN 23014066 AND 23014082	EA	1
B-9	9	PBDZZ	5315-00-014-1226	21450	141226	PIN,STRAIGHT,HEADLESS	EA	1
B-9	10	XADZZ		19207	7710932	CARRIER	EA	1
B-9	11	PAHZZ	5306-00-776-7782	19207	7767782	BOLT,MACHINE	EA	6
B-9	12	XAHZZ		19207	7708641	CAP	EA	1
B-9	13	PBHZZ	2520-00-776-7791	19207	7767791	DOWEL	EA	2
B-9	14	PADZZ	5315-00-014-1234	21450	141234	PIN,STRAIGHT,HEADLESS	EA	1
B-9	15	PAHZZ	2520-00-776-7799	19207	7767799	PIN	EA	2
B-9	16	PADZZ	5315-00-014-1260	21450	141260	PIN,STRAIGHT,HEADLESS	EA	2
B-9	17	PAHZZ	5306-00-292-4594	21450	9409050	BOLT,SELF-LOCKING	EA	2
B-9	18	PADZZ	2520-00-776-8091	19207	7768091	SLEEVE	EA	1
B-9	19	PADZZ	5315-00-776-8094	19207	7768094	PIN,STRAIGHT,HEADLESS	EA	6
B-9	20	PADZZ	5315-00-770-7239	19207	7707239	KEY,MACHINE	EA	3
B-9	21	PAHZZ	5306-00-940-9051	21450	9409051	BOLT,SELF-LOCKING	EA	3
B-9	22	PAHZZ	5306-00-940-9036	21450	9409036	BOLT,SELF-LOCKING	EA	15
B-9	23	XAHZZ		19207	7710931	CARRIER	EA	1
B-9	24	PAHZZ	3805-00-847-6847	81240	444654	PLUG,PIPE	EA	1
B-9	25	PAHZZ	3120-00-717-6039	19207	8350903	BEARING,SLEEVE	EA	1
B-9	26	PADZZ	5315-00-922-1669	19207	8350900	PIN,STRAIGHT,HEADLESS	EA	3
B-9	27	PAHZZ	3120-00-717-6038	19207	8350902	BEARING,SLEEVE	EA	1
B-9	28	PAHZZ	3120-00-717-6018	19207	8350901	BEARING,SLEEVE	EA	1
B-9	29	PAHZZ	5365-00-770-7240	19207	7707240	RING,RETAINING	EA	3
B-9	30	PAHZZ	5310-00-754-0474	19207	7540474	NUT,PLAIN,ROUND	EA	2
B-9	31	PAHZZ	3110-00-156-7924	19207	8350835	BEARING,BALL,ANNULAR	EA	1

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-9	32	PAHZZ	3110-00-159-9347	19207	8350726	BEARING,ROLLER,CYLINDICAL	EA	1
B-9	33	PAHZZ	3020-00-679-4490	19207	7710936	GEAR,HELICAL	EA	1
B-9	34	PAHZZ	5365-00-776-7787	19207	7767787	SHIM	EA	V
B-9	34	PAHZZ	5365-00-776-7792	19207	7767792	SHIM	EA	V
B-9	35	PAHZZ	2520-00-770-7238	19207	7707238	CAGE	EA	1
B-9	36	PAHZZ	3110-00-752-7810	19207	8350845	BEARING,ROLLER,CYLINDRICAL	EA	1
B-9	37	PAHZZ	3110-00-752-7800	19207	8350844	BEARING,BALL,ANNULAR	EA	1
B-9	38	XBHZZ		19207	7710840	SPACER	EA	1
B-9	39	XBHZZ		19207	7710826	RETAINER	EA	1
B-9	40	PAHZZ	5306-01-137-9712	96906	MS35764-635	BOLT,SELF-LOCKING	EA	8
B-9	41	PAHZZ	5310-00-753-9887	19207	7539887	NUT,PLAIN,ROUND	EA	1
B-9	42	PAHZZ	3110-00-277-0274	19207	7371938	BEARING,ROLLER,CYLINDRICAL	EA	1
B-9	43	PAHZZ	3020-00-679-4491	19207	7710937	GEAR,HELICAL	EA	1
B-9	44	PBHZZ	4710-01-040-7419	19207	7709650	TUBE,BENT,METAL	EA	1
B-9	45	PBHZZ	4730-01-018-1755	96906	MS51819-7	ADAPTER,STRAIGHT PN MS51819-7P OR PN MS51819-7Z OPTIONAL FOR PN MS51819-7	EA	2
B-9	46	PBHZZ	4730-01-035-7544	96906	MS51819-37	ADAPTER,STRAIGHT	EA	1
B-9	47	PBHZZ	4730-00-834-0664	96906	MS51825-5	SLEEVE,CLINCH	EA	1
B-9	48	PBHZZ	4730-00-025-7508	96906	MS51823-5	NUT,TUBE COUPLING	EA	1
B-9	49	PAHZZ3	2520-00-753-9738	19207	7539738	CUP,COMPRESSION	EA	1
B-9	50	PAHZZ	5306-01-137-9712	96906	MS35764-635	BOLT,SELF-LOCKING	EA	18



TA 272415

Figure B-10. Low planetary, band assembly and high clutch

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0713 INTERMEDIATE CLUTCH-- LOW PLANETARY,BAND ASSEMBLY AND HIGH CLUTCH		
B-10	1	PAHZZ	5306-00-292-5340	96906	MS35764-637	BOLT,SELF-LOCKING	EA	8
B-10	2	PAHZZ	3020-00-776-7640	19207	7767640	GEAR,INTERNAL	EA	1
B-10	3	PAHDD	2520-00-776-7647	19207	7767647	CARRIER ASSY	EA	1
B-10	4	PADZZ	2520-00-776-7643	19207	7767643	CARRIER ASSY,MACHINING	EA	1
B-10	5	PADZZ	5315-00-776-7645	19207	7767645	PIN,STAIGHT,HEADLESS	EA	4
B-10	6	XADZZ		19207	8344552	HUB	EA	1
B-10	7	XBDZZ		19207	7767621	PIN	EA	2
B-10	8	XADZZ		19207	7708649	CARRIER	EA	1
B-10	9	PADZZ	5306-00-292-4592	21450	9409048	BOLT,SELF-LOCKING	EA	6
B-10	10	KDDZZ	2520-00-776-7608	19207	7767608	SPINDLE PART OF KIT PN 7710893	EA	4
B-10	11	KDDZZ	5305-00-776-7612	19207	7767612	SETSCREW PART OF KIT PN 7710893	EA	4
B-10	12	KDDZZ	3120-00-776-7637	19207	7767637	BEARING,WASHER,THRUST PART OF KIT PN 7710893	EA	8
B-10	13	KDDZZ	3120-00-776-7636	19207	7767636	BEARING,WASHER,THRUST PART OF KIT PN 7710893	EA	8
B-10	14	KDDZZ	3110-00-776-7611	19207	7767611	ROLLER,BEARING PART OF KIT PN 7710893	EA	44
B-10	15	KDDZZ	2520-00-776-7599	19207	7767599	PINION SET PART OF KIT PN 7710893	EA	1
B-10	16	PAHZZ	5306-01-043-5701	234617	9422502	BOLT,SELF-LOCKING	EA	24
B-10	17	PAHHH	3020-00-776-7575	19207	7767575	GEAR,INTERNAL	EA	1
B-10	18	XAHZZ		19207	7994570	GEAR	EA	1
B-10	19	PAHZZ	5315-01-048-3353	19207	7767508	PIN,STRAIGHT,HEADLESS	EA	3
B-10	20	PAHZZ	2520-00-776-7510	19207	7767510	DISK,CLUTCH	EA	1
B-10	21	PAHZZ	3120-00-776-7609	19207	7767609	BEARING,WASHER,THRUST	EA	1
B-10	22	PAHZZ	3020-00-771-5620	19207	8351059	GEAR,SPUR	EA	1
B-10	23	PAHZZ	2520-00-776-7570	19207	7767570	SEAL RING,METAL	EA	3
B-10	24	KFHZZ		19207	7710819	PLATE PART OF KIT PN 8348332	EA	2
B-10	25	PAHZZ	2520-00-776-7574	19207	7767574	DISK,CLUTCH	EA	6
B-10	26	KFHZZ	2520-00-239-3463	19207	7710788	DISK,CLUTCH PART OF KIT PN 8348332	EA	5
B-10	27	PAHZZ	5360-00-104-2452	19207	8357270	SPRING,HELICAL,COMPRESSION	EA	24
B-10	28	PAHHH	2520-00-983-6918	19207	8351058	PISTON,CLUTCH,TRANSMISSION	EA	1
B-10	29	PAHZZ	5315-00-776-7515	19207	7767515	PIN	EA	3
B-10	30	XAHZZ		19207	8351057	PISTON	EA	1
B-10	31	PAHZZ	5330-00-753-9712	19207	7539712	SEAL,RUBBER	EA	1
B-10	32	PAHZZ	5313-00-776-7514	19207	7767514	KEY,MACHINE	EA	3
B-10	33	PAHZZ	5305-00-776-7648	19207	7767648	SETSCREW	EA	3
B-10	34	PAHZZ	2530-00-658-4086	19207	7708076	DRUM	EA	1
B-10	35	PAFDD	2530-00-679-4495	19207	8350561	BRAKE BAND ASSEMBLY	EA	2
B-10	36	PAHZZ		60380	QP50256	PIN,STRAIGHT,HEADLESS	EA	2
B-10	37	XAHZZ		19207	8344384	STRUT,BAND APPLY	EA	1

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-10	38	XAHZZ		19207	7994568	STRUT,BAND ANCHOR		EA	1
B-10	39	XADZZ		19207	7710381	BAND		EA	1
B-10	40	PADZZ	2520-01-146-1894	19207	11650088	LINING,FRICTION,END		EA	2
B-10	40A	PADZZ	2520-01-146-1893	19207	11650089	LINING,FRICTION,CENTER		EA	1
B-10	41	PAHZZ	2520-00-776-7641	19207	7767641	SEAL RING,METAL		EA	2
B-10		PAHZZ	2520-00-323-8533	19207	8348332	PART KIT,CLUTCH PLATE		EA	V
B-10	24					PLATE		EA	2
B-10	26					DISK,CLUTCH		EA	5
B-10		PADZZ	2520-00-319-5920	19207	7710893	PARTS KIT,PINION		EA	V
B-10	10					SPINDLE		EA	4
B-10	11					SCREW		EA	4
B-10	12					BEARING,WASHER,THRUST		EA	8
B-10	13					BEARING,WASHER,THRUST		EA	8
B-10	14					ROLLER		EA	44
B-10	15					PINION SET		EA	1

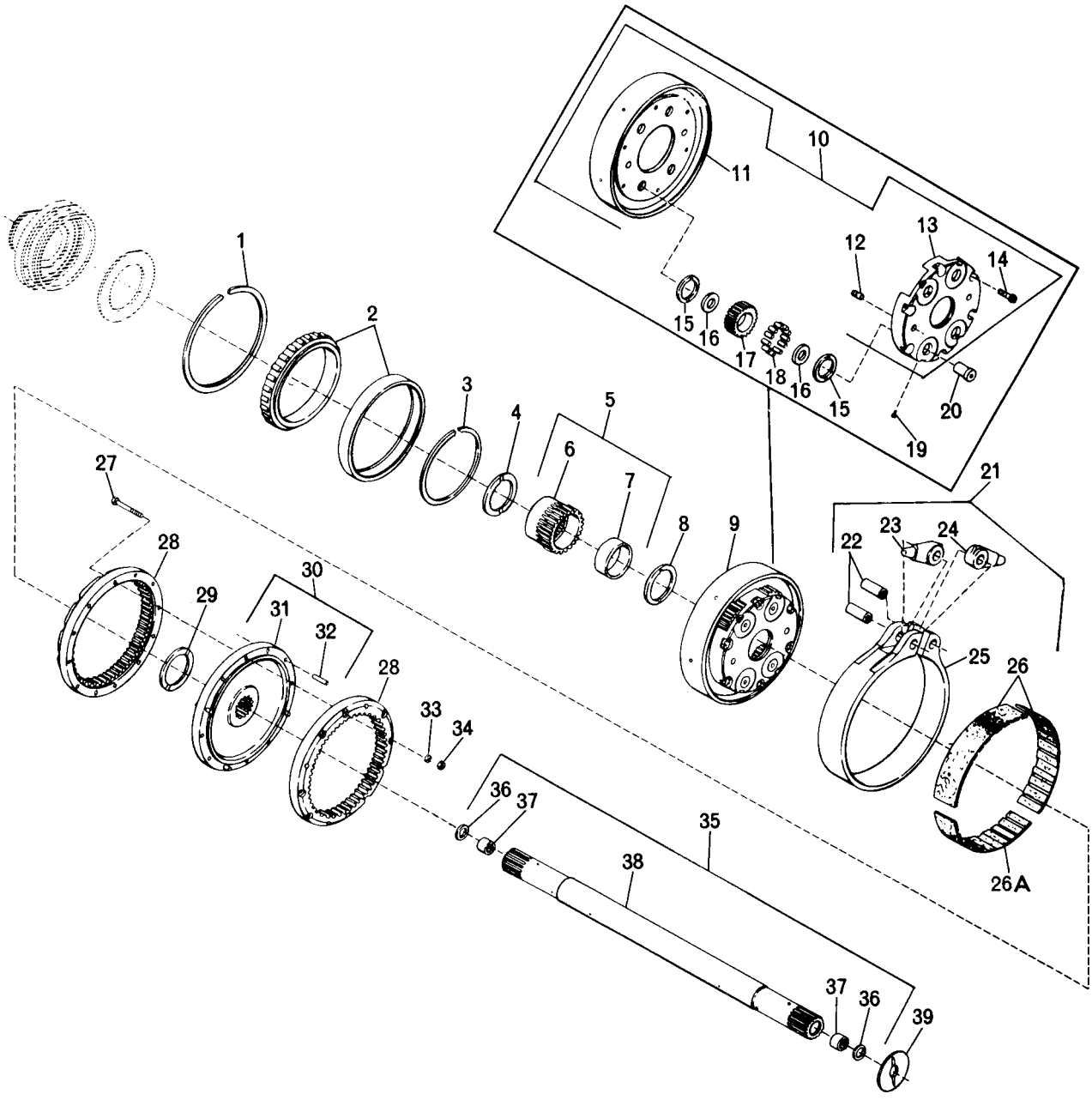


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Figure B-11. Band assembly, low gear and main cross drive assembly

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0713 INTERMEDIATE CLUTCH-- BAND ASSEMBLY,LOW GEAR AND MAIN CROSS DRIVE ASSEMBLY		
B-11	1	PAHZZ	5365-00-776-7615	19207	7767615	RING,RETAINING	EA	1
B-11	2	PAHZZ		19207	8350831	BEARING,ROLLER,CYLINDRICAL	EA	1
B-11	3	PAHZZ	5365-00-776-7616	19207	7767616	RING,RETAINING	EA	1
B-11	4	PAHZZ	3120-00-776-7607	19207	7767607	BEARING,WASHER,TRHUST	EA	1
B-11	5	PAHDD	2520-00-776-7602	19207	7767602	GEAR	EA	1
B-11	6	XADZZ		19207	7708053	GEAR,SPUR	EA	1
B-11	7	PBDZZ	3120-00-776-7512	19207	7767512	BEARING,SLEEVE	EA	1
B-11	8	PAHZZ	3120-00-776-7609	19207	7767609	BEARING,WASHER,THRUST	EA	1
B-11	9	AHDDD	2520-00-776-7597	19207	7767597	CARRIER ASSY	EA	1
B-11	10	PADZZ	2520-00-776-7601	19207	7767601	CARRIER	EA	1
B-11	11	PBDZZ	2520-00-737-4143	19207	7374143	DRUM	EA	1
B-11	12	PADZZ	5315-00-776-7621	19207	7767621	PIN	EA	2
B-11	13	XADZZ		19207	7708650	CARRIER	EA	1
B-11	14	PADZZ	5306-00-940-9049	96906	MS35764-651	BOLT,SELF-LOCKING	EA	6
B-11	15	KDDZZ	3120-00-776-7637	19207	7767637	BEARING,WASHER,THRUST PART OF KIT PN 7710893	EA	8
B-11	16	KDDZZ	3120-00-776-7636	19207	7767636	BEARING,WASHER,THRUST PART OF KIT PN 7710893	EA	8
B-11	17	KDDZZ	2520-00-776-7599	19207	7767599	PINION SET PART OF KIT PN 7710893	EA	1
B-11	18	KDDZZ	3110-00-776-7611	19207	7767611	ROLLER,BEARING PART OF KIT PN 7710893	EA	44
B-11	19	KDDZZ	5305-00-776-7612	19207	7767612	SETSCREW PART OF KIT PN 7710893	EA	4
B-11	20	KDDZZ	2520-00-776-7608	19207	7767608	SPINDLE PART OF KIT PN 7710893	EA	4
B-11	21	PAFDD	2530-00-679-4495	19207	8350561	BRAKE BAND ASSEMBLY	EA	1
B-11	22	PAHZZ		60380	QP50256	PIN,STRAIGHT,HEADLESS	EA	2
B-11	23	XAHZZ		19207	8344384	STRUT,BAND APPLY	EA	1
B-11	24	XAHZZ		19207	7994568	STRUT,BAND ANCHOR	EA	1
B-11	25	XAHZZ		19207	7710381	BAND	EA	1
B-11	26	PADZZ	2520-01-146-1894	19207	11650088	LINING,FRICTION,END	EA	2
B-11	26A	PADZZ	2520-01-146-1893	19207	11650089	LINING,FRICTION,CENTER	EA	1
B-11	27	PAHZZ	5306-00-776-7614	19207	7767614	BOLT,MACHINE	EA	8
B-11	28	PAHZZ	3020-00-776-7640	19207	7767640	GEAR,INTERNAL	EA	2
B-11	29	PAHZZ	3120-00-776-7610	19207	7767610	BEARING,WASHER,THRUST	EA	1
B-11	30	PBHHH	2520-00-776-7603	19207	7767603	HUB ASSY	EA	1
B-11	31	XAHZZ		19207	7709217	HUB	EA	1
B-11	32	PBHZZ	5315-00-776-7598	19207	7767598	PIN,STRAIGHT,HEADLESS	EA	4
B-11	33	PAHZZ	5310-01-261-7340	96906	MS35338-8	WASHER,LOCK	EA	8
B-11	34	PAHZZ	5310-00-725-7382	96906	MS35690-624	NUT,PLAIN,HEXAGON	EA	8
B-11	35	PAHHH	2520-00-692-4900	19207	7709548	SHAFT ASSY,MAIN	EA	1
B-11	36	PAHZZ	5365-00-776-7794	19207	7767794	SHIM	EA	2

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-11	37	PAHZZ	3110-00-183-6723	21450	709435	BEARING,ROLLER,NEEDLE		EA	2
B-11	38	XAHZZ		19207	7709546	SHAFT		EA	1
B-11	39	PAFZZ	3120-00-776-7676	19207	7767676	BEARING,WASHER,THRUST		EA	1
B-11		PADZZ	2520-00-319-5920	19207	7710893	PARTS KIT,PINION		EA	V
B-11	15					BEARING,WASHER,THRUST		EA	8
B-11	16					BEARING,WASHER,THRUST		EA	8
B-11	17					PINION SET		EA	1
B-11	18					ROLLER		EA	44
B-11	19					SCREW		EA	4
B-11	20					SPINDLE		EA	4

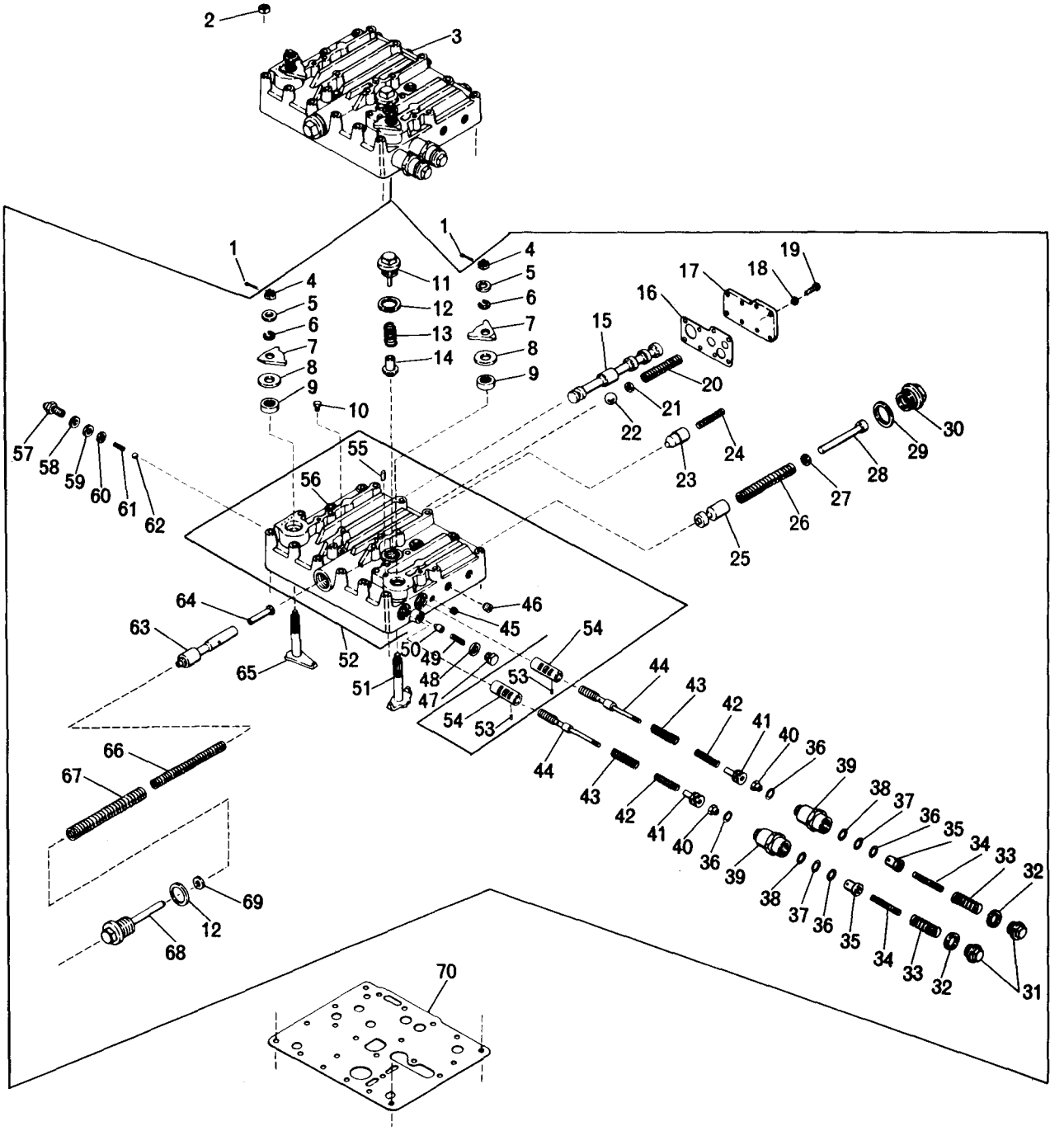

Figure B-12. Control valve assembly

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0714 SERVO UNIT-- CONTROL VALVE ASSEMBLY			
B-12	1	PAHZZ	5315-00-842-3044	96906	MS24665-283	PIN,COTTER		EA	2
B-12	2	PAHZZ	5310-00-725-7382	96906	MS35690-624	NUT,PLAIN,HEXAGON		EA	22
B-12	3	PAHDD	2520-01-022-9748	19207	11649939	VALVE ASSEMBLY		EA	1
B-12	4	PAHZZ	5310-00-842-1488	96906	MS35692-21	NUT,SLOTTED,HEXAGON		EA	2
B-12	5	PAHZZ	5310-00-194-7256	96906	MS15795-215	WASHER,FLAT		EA	2
B-12	6	PAHZZ	5365-00-776-7532	19207	7767532	RING,RETAINING		EA	2
B-12	7	PBHZZ	5355-00-776-7634	73342	6700685	POINTER,DIAL		EA	2
B-12	8	PAHZZ	3120-00-711-5828	19207	7767678	BEARING,WASHER,THRUST		EA	2
B-12	9	PAHZZ	5330-00-297-6439	19207	7767533	SEAL,PLAIN,ENCASED		EA	2
B-12	10	PAOZZ	4730-00-018-9566	19207	444612	PLUG,PIPE		EA	5
B-12	11	PAHZZ	2520-00-776-7549	19207	7767549	PLUG ASSEMBLY		EA	1
B-12	12	PAHZZ	5330-00-776-7565	19207	7767565	GASKET		EA	2
B-12	13	PAHZZ	5360-00-776-7539	19207	7767539	SPRING,HELICAL,COMPRESSION		EA	1
B-12	14	PAHZZ	2520-00-776-7557	19207	7767557	VALVE		EA	1
B-12	15	PAHZZ	2520-00-692-4910	19207	7709725	VALVE		EA	1
B-12	16	PAHZZ	5330-00-776-7633	19207	7767633	GASKET		EA	1
B-12	17	PBHZZ	2520-00-776-7563	19207	7767563	COVER,ACCESS		EA	1
B-12	18	PAHZZ	5310-00-582-5965	96906	MS35338-6	WASHER,LOCK		EA	8
B-12	19	PAHZZ	5305-00-068-0513	96906	MS35304-6	SCREW,CAP,HEXAGON		EA	8
B-12	20	PAHZZ	5360-00-770-8109	19207	7708109	SPRING,HELICAL,COMPRESSION		EA	1
B-12	21	PAHZZ	5310-00-809-3078	24617	106261	WASHER,FLAT		EA	1
B-12	22	PAHZZ	3110-00-948-9797	96906	MS19061-19	BALL,BEARING		EA	1
B-12	23	PAHZZ	2520-00-561-9961	19207	7707828	VALVE,LUBRICATING		EA	1
B-12	24	PAHZZ	5360-00-569-8447	19207	7709598	SPRING,HELICAL,COMPRESSION		EA	1
B-12	25	PAHZZ	2520-00-776-7677	19207	7767677	VALVE		E•A	1
B-12	26	PAHZZ	5360-00-321-5955	19207	7709907	SPRING,HELICAL,COMPRESSION		EA	1
B-12	27	PAHZZ	5310-00-724-2453	19207	7374122	WASHER,FLAT		EA	V
B-12	28	PAHZZ	5315-00-776-7554	19207	7767554	PIN		EA	1
B-12	29	PAHZZ	5330-00-776-7568	19207	7767568	SPACER,RING		EA	1
B-12	30	PBHZZ	5365-00-776-7550	19207	7767550	PLUG,MACHINE,THREADED		EA	1
B-12	31	PBHZZ	5365-00-776-7548	19207	7767548	PLUG,MACHINE,THREADED		EA	2
B-12	32	PAHZZ	5330-00-088-5245	19207	8355808	GASKET		EA	4
B-12	33	PAHZZ	5360-00-088-4547	19207	8355807	SPRING,HELICAL,COMPRESSION		EA	2
B-12	34	PAHZZ	5360-00-088-6263	19207	8355806	SPRING,HELICAL,COMPRESSION		EA	2
B-12	35	XAHZZ		19207	8355805	PLUNGER,DETENT		EA	2
B-12	36	PAHZZ	5365-00-088-5246	19207	8355811	SPACER,RING		EA	V
B-12	37	PAHZZ	5365-00-088-5244	19207	8355803	SPACER,RING		EA	V
B-12	38	PAHZZ	5365-00-088-5243	19207	8355802	SPACER,RING		EA	V

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-12	39	PBHZZ	2520-00-191-1011	19207	8355804	HOUSING,TRANSMISSION		EA	2
B-12	40	PAHZZ	5310-00-770-8035	19207	7708035	NUT,SLEEVE		EA	2
B-12	41	PAHZZ	2520-01-045-5760	19207	11649941	RETAINER,STEERING		EA	2
B-12	42	PAHZZ	5360-01-050-2946	19207	11649995	SPRING,HELICAL,COMPRESSION		EA	2
B-12	43	PAHZZ	5360-00-752-1771	19207	7521771	SPRING,HELICAL,COMPRESSION		EA	2
B-12	44	PAHZZ	2520-00-753-9891	19207	7539891	VALVE		EA	2
B-12	45	PAHZZ	4730-00-195-6022	19207	444588	PLUG,PIPE		EA	1
B-12	46	PAHZZ	4730-00-018-9566	96906	MS49005-2	PLUG,PIPE		EA	1
B-12	47	PBHZZ	5365-00-770-8009	19207	7708009	PLUG,MACHINE,THREADED		EA	1
B-12	48	PAHZZ	5310-00-770-7786	19207	7707786	WASHER,FLAT		EA	1
B-12	49	PAHZZ	5360-00-774-5575	19207	7767545	SPRING,HELICAL,COMPRESSION		EA	1
B-12	50	PAHZZ	2520-00-770-8010	19207	7708010	DETENT,STEERING		EA	1
B-12	51	PAHZZ	2520-00-776-7535	19207	7767535	SHAFT		EA	1
B-12	52	PBHHH	2520-01-021-2254	19207	7708258	BODY ASSEMBLY		EA	1
B-12	53	PAHZZ	5315-00-044-1318	21450	441318	PIN,STRAIGHT,HEADLESS		EA	2
B-12	54	PAHZZ	2520-00-776-7541	19207	7767541	SLEEVE,DIRECTIONAL		EA	2
B-12	55	PAHZZ	5315-00-014-1240	21450	141240	PIN,STRAIGHT,HEADLESS		EA	1
B-12	56	XAHZZ		19207	7708259	BODY,CONTROL VALVE		EA	1
B-12	57	PAHZZ	2520-00-302-1043	19207	7708262	PLUG,SHIFT LEVER		EA	1
B-12	58	PAHZZ	5310-00-770-7786	19207	7707786	WASHER,FLAT		EA	V
B-12	59	PAHZZ	5310-00-039-8452	19207	7709255	WASHER,FLAT		EA	V
B-12	60	PAHZZ	5330-00-039-8453	19207	7709256	GASKET		EA	V
B-12	61	PAHZZ	5360-00-597-0773	19207	7708263	SPRING,HELICAL,COMPRESSION		EA	1
B-12	62	PAHZZ	3110-00-142-6040	96906	MS19061-11	BALL,BEARING		EA	1
B-12	63	PAHZZ	2520-00-770-8111	19207	7708111	VALVE,REGULATOR		EA	1
B-12	64	PBHZZ	5315-00-752-1416	19207	7521416	PIN,GROOVED,HEADED		EA	1
B-12	65	PAHZZ	2520-00-561-9967	19207	7708260	LEVER ASSY,SHIFT		EA	1
B-12	66	PAHZZ	5360-00-597-1225	19207	7709623	SPRING,HELICAL,COMPRESSION		EA	2
B-12	67	PAHZZ	5360-00-770-8105	19207	7708105	SPRING,HELICAL,COMPRESSION		EA	1
B-12	68	PAHZZ	2520-00-770-8103	19207	7708103	PLUG ASSY,REGULATOR		EA	1
B-12	69	PAHZZ	5310-00-770-8107	19207	7708107	WASHER,FLAT		EA	V
B-12	70	PAHZZ	5330-00-561-9965	19207	7708127	GASKET		EA	1

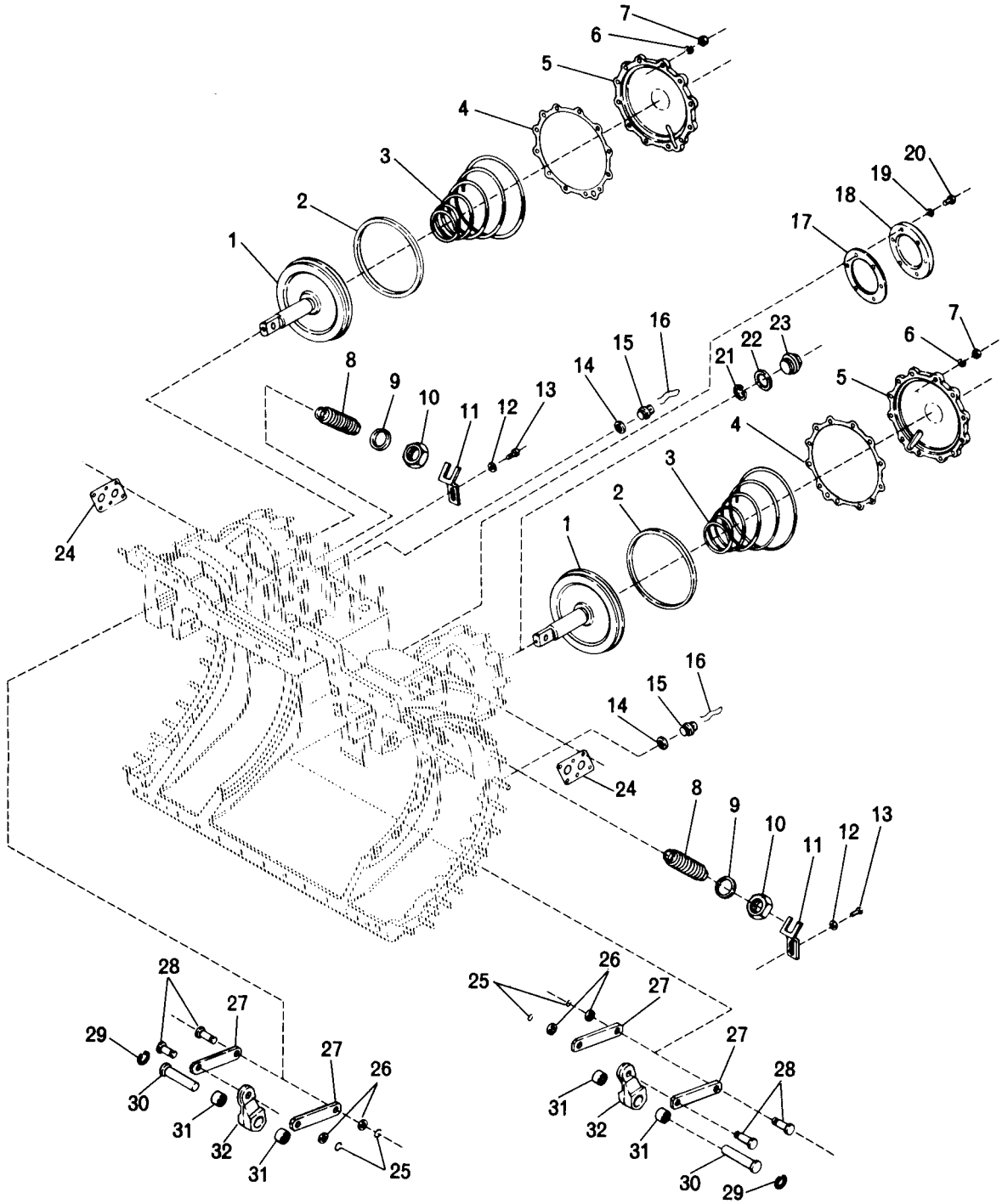

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Figure B-13. Servo pistons and linkage

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0714 SERVO UNIT-- SERVO PISTONS AND LINKAGE		
B-13	1	PAHZZ	2520-00-776-7853	19207	7767853	PISTON ASSY	EA	2
B-13	2	PAFZZ	2520-00-753-9702	19207	7539702	CUP,COMPRESSION	EA	2
B-13	3	PAFZZ	5360-00-776-8038	19207	7768038	SPRING,HELICAL,COMPRESSION	EA	2
B-13	4	PAFZZ	5330-00-776-7869	19207	7767869	GASKET	EA	2
B-13	5	PAFZZ	2520-00-776-8034	19207	7768034	COVER,ACCESS	EA	2
B-13	6	PAFZZ	5310-00-261-7340	96906	MS35338-8	WASHER,LOCK	EA	24
B-13	7	PAFZZ	5310-00-725-7382	96906	MS35690-624	NUT,PLAIN,HEXAGON	EA	24
B-13	8	PBOZZ	5305-00-776-7870	19207	7767870	SCREW	EA	2
B-13	9	PAOZZ	5365-00-776-7848	19207	7767848	SPACER,RING	EA	2
B-13	10	PAOZZ	5310-00-776-7870	19207	7767871	NUT,SELF-LOCKING	EA	2
B-13	11	PAOZZ	2520-00-776-7847	19207	7767847	PLATE	EA	2
B-13	12	PAOZZ	5310-00-194-7256	96906	MS15795-215	WASHER,FLAT	EA	2
B-13	13	PAOZZ	5306-01-064-5440	96906	MS35764-231	BOLT,SELF-LOCKING	EA	2
B-13	14	PAOZZ	5330-00-514-3289	96906	MS35769-21	GASKET	EA	2
B-13	15	PAOZZ	5365-00-770-7751	19207	7707751	PLUG,MACHINE,THREADED	EA	2
B-13	16	PAOZZ	2520-00-073-5412	80244	22W1630	WIRE	EA	V
B-13	17	PAFZZ	5330-00-776-7859	19207	7767859	GASKET	EA	1
B-13	18	PAFZZ	5340-00-776-7866	19207	7767866	COVER,ACCESS	EA	1
B-13	19	PAFZZ	5310-00-010-3322	96906	MS35338-9	WASHER,LOCK	EA	6
B-13	20	PAFZZ	5305-00-018-1392	21450	181392	SCREW,CAP,HEXAGON	EA	6
B-13	21	PAHZZ	5365-00-838-7706	96906	MS16625-143	RING,RETAINING	EA	1
B-13	22	PAFZZ	5330-00-776-7860	19207	7767860	GASKET	EA	1
B-13	23	PAFZZ	5365-00-776-7855	19207	7767855	PLUG,MACHINE,THREADED	EA	1
B-13	24	PAFZZ	5330-00-770-7806	19207	7707806	GASKET	EA	2
B-13	25	PAHZZ	5365-00-776-7851	19207	7767851	RING,RETAINING	EA	4
B-13	26	PAHZZ	5310-00-776-7872	19207	7767872	WASHER,FLAT	EA	4
B-13	27	PAHZZ	3040-00-776-7868	19207	7767868	CONNECTING LINK	EA	4
B-13	28	PAHZZ	5315-00-893-5933	19207	7767850	PIN,GROOVED,HEADED	EA	4
B-13	29	PAHZZ	5365-00-282-7402	19207	7708122	RING,RETAINING	EA	2
B-13	30	PAHZZ	2520-00-039-7690	19207	7709308	SHAFT,STRAIGHT	EA	2
B-13	31	PAHZZ	3110-00-157--531	24617	148415	BEARING ASSY,ROLLER	EA	4
B-13	32	PAHZZ	2520-00-776-7849	19207	7767849	LEVER	EA	2

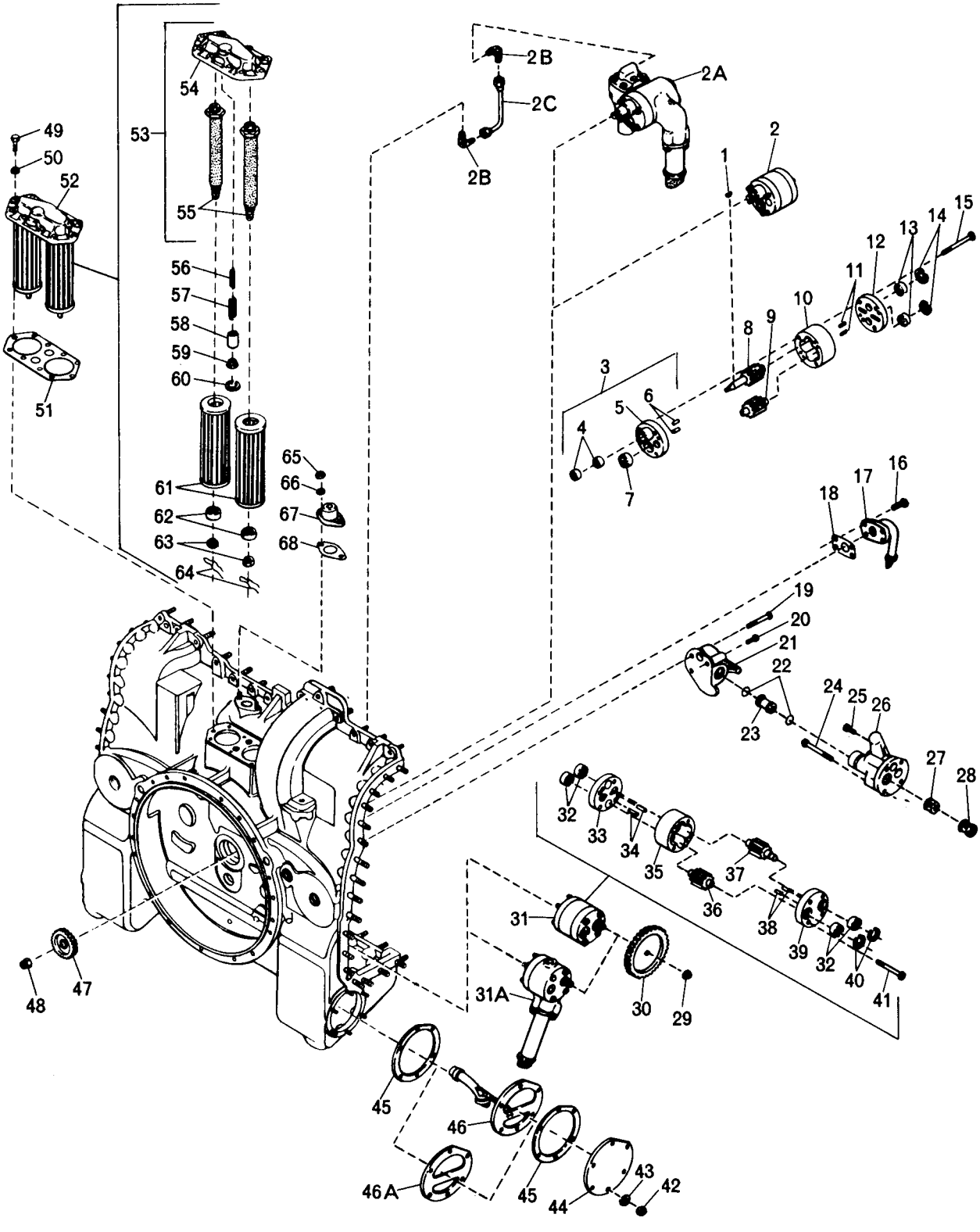

Figure B-14. Strainer assembly, oil filter, input and output oil pumps

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0721 COOLERS,PUMPS,MOTORS-- STRAINER ASSY,OIL FILTER, INPUT AND OUTPUT OIL PUMP		
B-14	1	PAHZZ	5315-00-687-5218	96906	MS35756-3	KEY,WOODRUFF USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	2	PAHDD	2520-00-404-7385	19207	11649924	PUMP,OIL INPUT USED WITH OIL PUMP PN 7707909	EA	1
B-14	2A	PAHZZ	2530-01-146-1870	73342	23014066	PUMP ASSY USED WITH OIL PUMP PN 23014082	EA	1
B-14	2B	PAHZZ	4730-00-647-3207	96906	MS51504-B4	ELBOW USED WITH OIL PUMPS PN 23014066 AND 23014082	EA	2
B-14	2C	PAHZZ	4710-01-146-1899	19207	11650070	TUBE ASSY USED WITH OIL PUMPS PN 23014066 AND 23014082	EA	1
B-14	3	PADZZ	2520-00-776-8068	19207	7768068	BASE ASSEMBLY USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	4	PADZZ	3110-00-112-5889	60380	GB1112	BEARING,ROLLER,NEEDLE USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	2
B-14	5	XADZZ		19207	7707892	BASE USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	6	PADZZ	5315-00-776-8164	19207	7768164	PIN USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	2
B-14	7	PBDZZ	3110-00-406-1539	19207	8350830	BEARING,ROLLER,CYLINDRICAL USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	8	PBDZZ	3040-01-040-5090	19207	11649925	GEARSHAFT,SPUR USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	9	PBDZZ	2520-00-776-8070	19207	7768070	GEAR USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	10	PBDZZ	2520-00-463-5877	19207	8344562	HOUSING,OIL PUMP USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	11	PADZZ	5315-00-776-8164	19207	7768164	PIN USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	2
B-14	12	PADZZ	2520-01-044-3237	19207	7768071	COVER,OIL PUMP USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	13	PBDZZ	3110-00-406-1539	19207	8350830	BEARING,ROLLER CYLINDRICAL USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	2
B-14	14	PADZZ	5365-00-832-4666	96906	MS16625-137	RING,RETAINING USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	2
B-14	15	PAHZZ	5306-00-940-9032	21450	9409032	BOLT,SELF-LOCKING USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	4
B-14	16	PAHZZ	5306-00-940-9013	19207	9409013	BOLT,SELF-LOCKING USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	4
B-14	17	PAHZZ	4710-01-036-3332	19207	11650030	TUBE ASSEMBLY,METAL USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	18	PAHZZ	5330-00-776-7838	19207	7767838	GASKET USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	19	PAHZZ	5306-01-045-6594	24617	9409015	BOLT,SELF-LOCKING	EA	2
B-14	20	PAHZZ	5306-00-940-9013	19207	9409013	BOLT,SELF-LOCKING	EA	1
B-14	21	PBHZZ	2520-01-040-4991	19207	8356031	PLATE,OIL TRANSFER	EA	1
B-14	22	PAHZZ	5330-00-752-1413	19207	7521413	PACKING,PREFORMED	EA	2
B-14	23	PAHZZ	2520-00-752-1427	19207	7521427	TUBE	EA	1
B-14	24	PAHZZ	5306-00-940-9032	21450	9409032	BOLT,SELF-LOCKING	EA	2
B-14	25	PAHZZ	5306-01-066-3529	96906	MS35764-233	BOLT,SELF-LOCKING	EA	2
B-14	26	XAHZZ		19207	8351029	BRACKET	EA	1
B-14	27	PAHZZ	4820-01-146-1886	19207	11650079	VALVE ASSY,CHECK USED WITH OIL PUMPS PN 23014066 AND 23014082	EA	1

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-14	27	PAHZZ	2520-00-770-8133	19207	7708133	VALVE ASSY,CHECK USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	28	PBHZZ	2520-00-692-4908	19207	7709644	SPACER,TRANSMISSION	EA	1
B-14	29	PAHZZ	5310-00-402-5220	19207	11649930	NUT,SELF-LOCKING USED WITH OIL PUMPS PN 23014066 AND 23014082	EA	1
B-14	29	PAHZZ	5310-00-752-1461	19207	7521461	NUT,SELF-LOCKING USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	30	PAHZZ	3020-01-146-8957	19207	11650078	GEAR,DRIVE USED WITH OIL PUMPS PN 23014066 AND 23014082	EA	1
B-14	30	PAHZZ	3020-00-572-4822	19207	7768166	GEAR,DRIVE USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	31	PAHDD	2520-00-770-7909	19207	7707909	PUMP ASSY,TRANSMISSION USED WITH OIL PUMP PN 11649924	EA	1
B-14	31A	PAHZZ	2520-01-146-1871	73342	23014082	PUMP ASSY,TRANSMISSION USED WITH OIL PUMP PN 23014066	EA	1
B-14	32	PADZZ	3110-00-406-1539	19207	8350830	BEARING,ROLLER,CYLINDRICAL USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	4
B-14	33	PBDZZ	2520-00-776-8133	19207	7768133	BASE USED OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	34	PBOZZ	5315-00-776-8073	19207	7768073	PIN,STRAIGHT,HEADLESS USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	2
B-14	35	PADZZ	2520-00-463-5877	19207	8344562	HOUSING,OIL PUMP USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	36	PBDZZ	2520-00-776-8070	19207	7768070	GEAR USED WITH PUMPS PN 11649924 AND 7707909	EA	1
B-14	37	PBDZZ	3020-01-056-7562	19207	7768169	GEAR,SPUR USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	38	PADZZ	5315-00-776-8164	19207	7768164	PIN,DOWEL USED WITH PUMPS PN 11649924 AND 7707909	EA	2
B-14	39	PADZZ	2520-01-044-3237	19207	7768071	COVER,OIL PUMP USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	40	PADZZ	5365-00-804-1509	96906	MS16625-3137	RING,RETAINING USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	2
B-14	41	PAHZZ	5306-00-940-9032	21450	9409032	BOLT,SELF-LOCKING	EA	4
B-14	42	PAOZZ	5310-00-723-2737	96906	MS35690-524	NUT,PLAIN HEXAGON	EA	6
B-14	43	PAOZZ	5310-00-010-3320	96906	MS35338-7	WASHER,LOCK	EA	6
B-14	44	PBOZZ	2520-00-431-3411	19207	8350686	COVER,ACCESS	EA	1
B-14	45	PAOZZ	5330-00-102-3651	19207	8357269	GASKET	EA	2
B-14	46	PAHZZ	2520-01-059-1534	19207	11650031	STRAINER ASSEMBLY USED WITH OIL PUMPS PN 11649924 AND 7707909	EA	1
B-14	46A	PAHZZ	5340-01-146-1906	19207	11650086	PLATE USED WITH OIL PUMPS PN 23014066 AND 2314082	EA	1
B-14	47	PAFZZ	3020-00-762-4502	19207	11649926	GEAR,SPUR	EA	1
B-14	48	PAFZZ	5310-00-402-5220	19207	11649930	NUT,SELF-LOCKING	EA	1
B-14	49	PAOZZ	5305-00-269-3213	96906	MS35295-62	BOLT,HEXAGON	EA	10
B-14	50	PAOZZ	5310-01-261-7340	96906	MS35338-8	WASHER,LOCK	EA	10
B-14	51	PAOZZ	5330-00-770-7232	19207	7707232	GASKET	EA	1
B-14	52	PAOOO	2520-00-516-4624	19207	7709371	FILTER ASSEMBLY	EA	1
B-14	53	PAOOO	2520-00-770-7917	19207	7707917	TUBE ASSY,OIL FILTER	EA	1
B-14	54	PAOZZ	2940-01-144-4884	19207	7707918	HEAD,FILTER	EA	1

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-14	55	PAOZZ	4710-01-144-8883	19207	8348268	TUBE ASSY		EA	2
B-14	56	PAOZZ	5360-00-695-8788	19207	7709333	SPRING,HELICAL,COMPRESSION		EA	1
B-14	57	PAOZZ	5360-00-695-8787	19207	7709331	SPRING,HELICAL,COMPRESSION		EA	1
B-14	58	PAOZZ	2940-00-695-8790	19207	7709370	VALVE,MAIN OIL		EA	1
B-14	59	PAOZZ	2995-00-695-8789	19207	7709369	SEAT,VALVE		EA	1
B-14	60	PAOZZ	5365-00-833-7454	96906	MS16625-1093	RING,RETAINING		EA	1
B-14	61	PAOZZ	2520-00-407-6752	19207	8356163	FILTER ELEMENT		EA	2
B-14	62	PAOZZ	5310-00-770-7981	19207	7707981	WASHER,RECESSED		EA	2
B-14	63	PAOZZ	5310-00-770-7980	19207	7707980	NUT,PLAIN,HEXAGON		EA	2
B-14	64	PAOZZ	9505-00-293-4208	96906	MS20995C32	WIRE,NONELECTRICAL		EA	V
B-14	65	PAFZZ	5310-00-725-7382	96906	MS35690-624	NUT,PLAIN,HEXAGON		EA	2
B-14	66	PAFZZ	5310-00-080-6004	96906	MS15795-14	WASHER,FLAT		EA	2
B-14	67	PBFZZ	2520-00-770-7971	19207	7707971	CAP,TRANSMISSION		EA	1
B-14	68	PAFZZ	5330-00-776-7735	19207	7767735	GASKET		EA	1

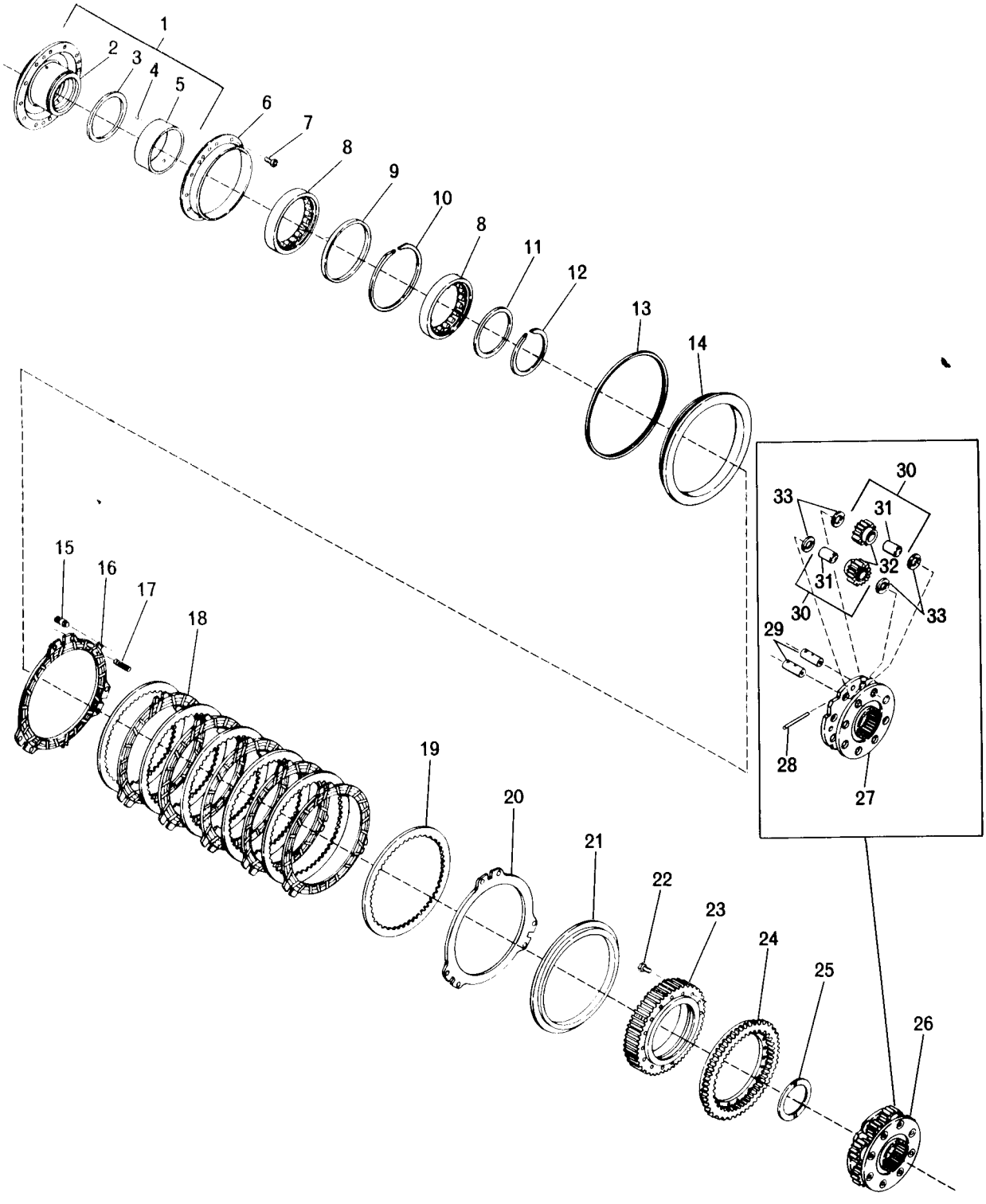

Figure B-15. Right steer clutch and steer differential planetary assembly

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0724 CLUTCH PACK OF STEERING CLUTCH-- RIGHT STEER CLUTCH AND STEER DIFFERENTIAL PLANETARY ASSEMBLY		
B-15	1	PAHHH	2520-00-337-6908	19207	7709440	HUB ASSY,RIGHT	EA	1
B-15	2	XAHZZ		19207	7709439	HUB	EA	1
B-15	3	PBHZZ	3120-00-752-1411	19207	7521411	BEARING,WASHER,THRUST	EA	1
B-15	4	PAHZZ	3110-00-100-6176	96906	MS19059-86	BALL,BEARING	EA	1
B-15	5	PAHZZ	3120-00-937-1969	19207	7707886	BEARING,SLEEVE	EA	1
B-15	6	PAHZZ	2520-00-337-6885	19207	7709434	BAFFLE,STEERING	EA	1
B-15	7	PAHZZ	5306-00-022-1950	96906	MS35764-632	BOLT,SELF-LOCKING	EA	12
B-15	8	PAHZZ	3110-00-184-8655	19207	8350523	BEARING,ROLLER,CYLINDRICAL	EA	2
B-15	9	PAHZZ	3120-00-776-8092	19207	7768092	BEARING,WASHER,THRUST	EA	1
B-15	10	PAHZZ	5365-00-776-8099	19207	7768099	RING,RETAINING	EA	1
B-15	11	PAHZZ	3120-00-752-1411	19207	7521411	BEARING,WASHER,THRUST	EA	1
B-15	12	PAHZZ	5365-00-776-8100	19207	7768100	RING,RETAINING	EA	1
B-15	13	PAHZZ	2520-00-753-9739	19207	7539739	CUP,COMPRESSION	EA	1
B-15	14	PBHZZ	2520-00-776-8095	19207	7768095	PISTON	EA	1
B-15	15	PAHZZ	2530-00-337-6931	19207	7709652	VALVE,STEERING	EA	1
B-15	16	KFHZZ	2520-00-234-1140	19207	7710791	DISK,CLUTCH PART OF KIT PN 8348331	EA	1
B-15	17	PAHZZ	5360-00-776-8087	19207	7768087	SPRING,HELICAL,COMPRESSION	EA	6
B-15	18	KFHZZ	2520-00-239-3463	19207	7710788	DISK,CLUTCH PART OF KIT PN 8348331	EA	5
B-15	19	PAHZZ	2520-00-776-7574	19207	7767574	DISK,CLUTCH	EA	6
B-15	20	KFHZZ	2520-00-248-1052	19207	7710790	DISK,CLUTCH PART OF KIT PN 8348331	EA	1
B-15	21	PAHZZ	2520-00-753-9884	19207	7539884	DISK,CLUTCH	EA	1
B-15	22	PAHZZ	5306-00-292-4593	96906	MS35764-617	BOLT,SELF-LOCKING	EA	16
B-15	23	PAHZZ	2530-00-337-6909	19207	7709441	DISK CLUTCH,HUB	EA	1
B-15	24	PAHZZ	2530-00-337-6915	19207	7709446	GEAR,RING STEER	EA	1
B-15	25	PAHZZ	3120-00-753-9848	19207	7539848	BEARING,WASHER,THRUST	EA	1
B-15	26	PAHHH	2520-00-753-9886	19207	7539886	DIFFERENTIAL	EA	1
B-15	27	PBHZZ	2530-01-042-3999	19207	7539850	HUB,STEERING,DIFFERENTIAL	EA	1
B-15	28	PAHZZ	5315-00-432-2148	19207	7710225	PIN,STRAIGHT,HEADLESS	EA	4
B-15	29	PAHZZ	2520-00-753-9860	19207	7539860	SPINDLE	EA	8
B-15	30	PAHZZ	3020-00-431-3407	19207	7707840	GEAR,SPUR	EA	8
B-15	31	XAHZZ		19207	7539858	BEARING,BUSHING	EA	8
B-15	32	XAHZZ		19207	7707964	PINION	EA	8
B-15	33	PAHZZ	3120-01-044-3122	19207	7539859	BEARING,WASHER,THRUST	EA	16
B-15		PAHZZ	2520-00-323-8532	19207	8348331	PARTS KIT,FRICTION	EA	V
B-15	16					DISK,CLUTCH	EA	1
B-15	18					DISK,CLUTCH	EA	5
B-15	20					DISK,CLUTCH	EA	1

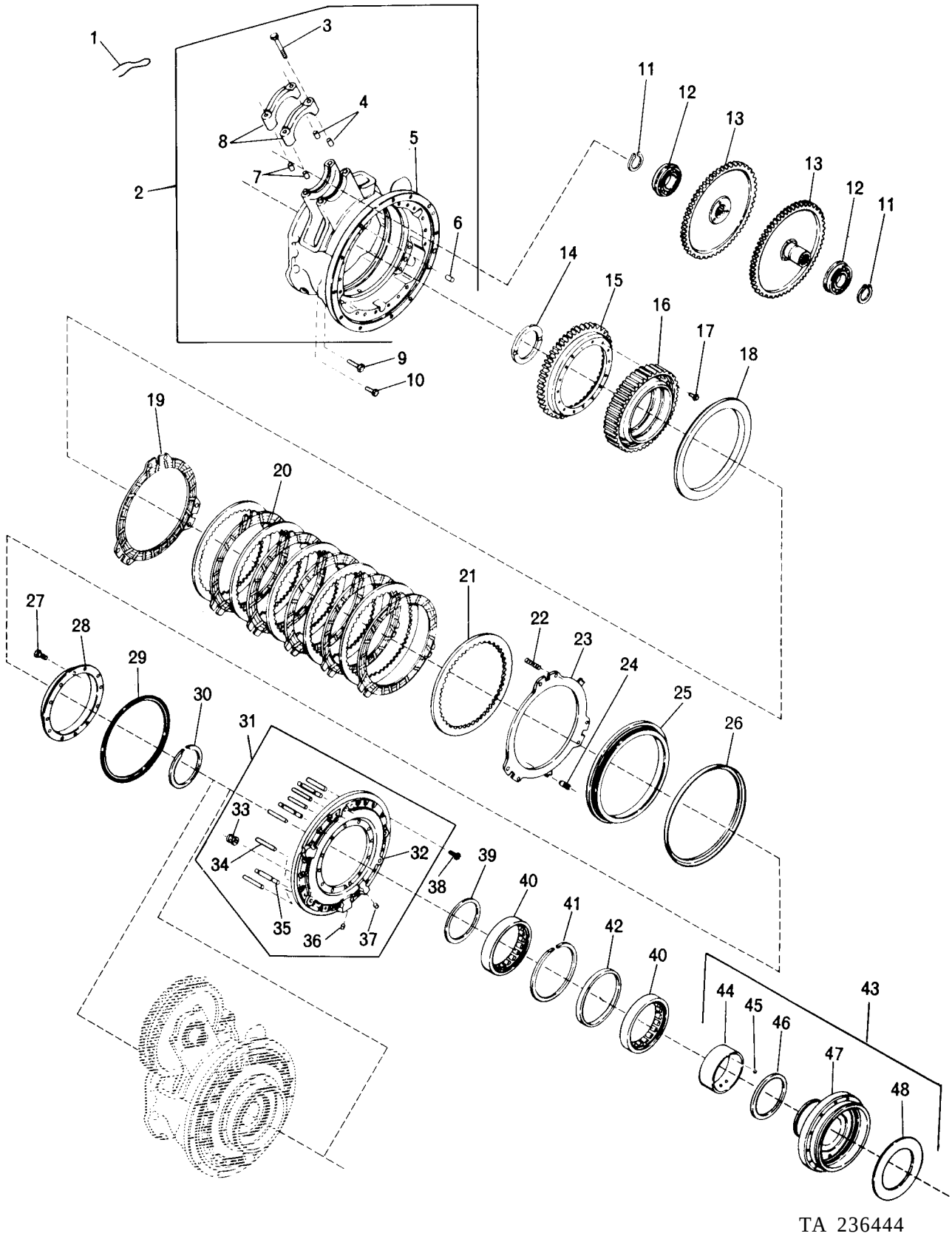

Figure B-16. Left steer clutch and housing, steer gears

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0724 CLUTCH PACK OF STEERING CLUTCH-- LEFT STEER CLUTCH AND HOUSING,STEER GEARS		
B-16	1	PAOZZ	2520-00-073-5412	21450	22W1630	WIRE	EA	V
B-16	2	PBHHH	2530-00-337-6883	19207	7709429	HOUSING,MECHANICAL	EA	1
B-16	3	PAHZZ	5305-00-776-8048	19207	7768048	SCREW,CAP,HEXAGON	EA	4
B-16	4	PBHZZ	5315-00-776-8050	19207	7768050	PIN,HOLLOW	EA	2
B-16	5	XAHZZ		19207	7709466	HOUSING,MECHANICAL	EA	1
B-16	6	PBHZZ	5315-00-014-1281	21450	141281	PIN,STRAIGHT,HEADLESS	EA	1
B-16	7	PBHZZ	3120-00-776-8051	19207	7768051	BUSHING,SLEEVE	EA	2
B-16	8	XAHZZ		19207	7707882	CAP	EA	2
B-16	9	PAHZZ	5306-00-940-5340	96906	MS35764-637	BOLT,SELF-LOCKING	EA	2
B-16	10	PAHZZ	5306-01-137-9712	96906	MS35764-635	BOLT,SELF-LOCKING	EA	16
B-16	11	PAHZZ	5340-00-103-4217	22560	274771	RING,RETAINING	EA	2
B-16	12	PAHZZ		19207	8350834	BEARING,BALL	EA	2
B-16	13	PAHZZ	3020-00-753-9882	19207	7539882	GEAR,SPUR	EA	2
B-16	14	PAHZZ	3120-00-753-9848	19207	7539848	BEARING,WASHER,THRUST	EA	1
B-16	15	PAHZZ	2530-00-337-6915	19207	7709446	GEAR,RING STEER	EA	1
B-16	16	PAHZZ	2530-00-337-6909	19207	7709441	DISK CLUTCH,HUB	EA	1
B-16	17	PAHZZ	5306-00-292-4593	96906	MS35764-617	BOLT,SELF-LOCKING	EA	16
B-16	18	PAHZZ	2520-00-753-9884	19207	7539884	DISK,CLUTCH	EA	1
B-16	19	KFHZZ	2520-00-248-1052	19207	7710790	DISK,CLUTCH PART OF KIT PN 8348331	EA	1
B-16	20	KFHZZ	2520-00-239-3463	19207	7710788	DISK,CLUTCH PART OF KIT PN 8348331	EA	5
B-16	21	PAHZZ	2520-00-776-7574	19207	7767574	DISK,CLUTCH	EA	6
B-16	22	PAHZZ	5360-00-776-8087	19207	7768087	SPRING,HELICAL,COMPRESSION	EA	6
B-16	23	KFHZZ	2520-00-234-1140	19207	7710791	DISK,CLUTCH PART OF KIT PN 8348331	EA	1
B-16	24	PAHZZ	2530-00-337-6931	19207	7709652	VALVE,STEERING	EA	1
B-16	25	PBHZZ	2520-00-776-8095	19207	7768095	PISTON	EA	1
B-16	26	PAHZZ	2520-00-753-9739	19207	7539739	CUP,COMPRESSION	EA	1
B-16	27	PAHZZ	5306-00-940-9036	21450	9409036	BOLT,SELF-LOCKING	EA	12
B-16	28	PAHZZ	2520-00-337-6885	19207	7709434	BAFFLE,STEERING	EA	1
B-16	29	PAHZZ	2520-00-753-9738	19207	7539738	CUP,COMPRESSION	EA	1
B-16	30	PAHZZ	5365-00-776-8100	19207	7768100	RING,RETAINING	EA	1
B-16	31	PBHDD	2530-00-563-4472	19207	7709412	COVER ASSEMBLY	EA	1
B-16	32	XADZZ		19207	7709398	COVER	EA	1
B-16	33	PBDZZ	2530-00-337-6933	19207	7709654	SLEEVE,STEERING	EA	1
B-16	34	PADZZ	5315-00-776-8094	19207	7768094	PIN,STRAIGHT,HEADLESS	EA	6
B-16	35	PADZZ	5315-00-770-7239	19207	7707239	KEY,MACHINE	EA	3
B-16	36	PADZZ	5315-00-014-1189	21450	141189	PIN,STRAIGHT,HEADLESS	EA	2
B-16	37	PBDZZ	5315-00-014-1212	21450	141212	PIN,STAIGHT,HEADLESS	EA	2

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-16	38	PAHZZ	5306-00-940-9036	21450	9409036	BOLT,SELF-LOCKING		EA	18
B-16	39	PAHZZ	3120-00-752-1411	19207	7521411	BEARING,WASHER,THRUST		EA	1
B-16	40	PAHZZ	3110-00-184-8655	19207	8350523	BEARING,ROLLER,CYLINDRICAL		EA	2
B-16	41	PAHZZ	5365-00-776-8099	19207	7768099	RING,RETAINING		EA	1
B-16	42	PAHZZ	3120-00-776-8092	19207	7768092	BEARING,WASHER,THRUST		EA	1
B-16	43	PAHHH	2520-00-337-6916	19207	7709449	HUB,CLUTCH,STEERING		EA	1
B-16	44	PBHZZ	3120-00-937-1969	19207	7707886	BEARING,SLEEVE		EA	1
B-16	45	PAHZZ	3110-00-100-6176	96906	MS19059-86	BALL,BEARING		EA	1
B-16	46	PBHZZ	3120-00-752-1411	19207	7521411	BEARING,WASHER,THRUST		EA	1
B-16	47	XAHZZ		19207	7709458	HUB		EA	1
B-16	48	PAHZZ	5310-00-753-9851	19207	7539851	WASHER,FLAT		EA	1
B-16		PAHZZ	2520-00-323-8532	19207	8348331	PARTS KIT,FRICTION		EA	V
B-16	19					DISK,CLUTCH		EA	1
B-16	20					DISK,CLUTCH		EA	5
B-16	23					DISK,CLUTCH		EA	1

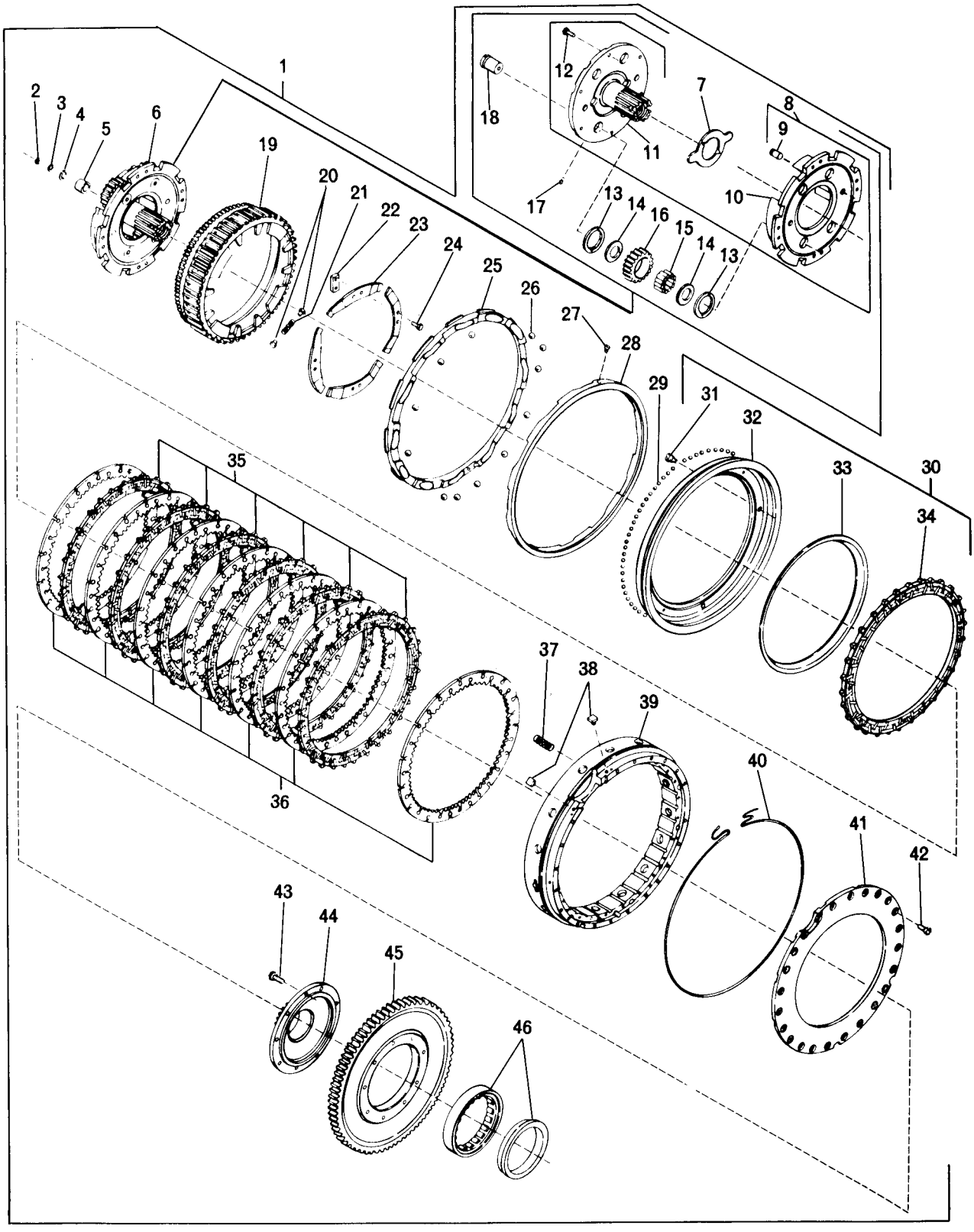

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Figure B-17. Left brake and output planetary

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0726 BRAKES-- LEFT BRAKE AND OUTPUT PLANETARY		
B-17	1	PBFDF	2520-00-333-3524	19207	8348320	COVER ASSEMBLY	EA	1
B-17	2	PAFZZ	5365-00-776-7625	19207	7767625	RING,RETAINING	EA	1
B-17	3	PAFZZ	2520-00-978-0648	19207	8355751	RING,TRANSMISSION	EA	1
B-17	4	PAFZZ	5365-00-776-7626	19207	7767626	RING,RETAINING	EA	1
B-17	5	PAFZZ	3110-00-143-2986	19207	7767623	RACE	EA	1
B-17	6	PAHDD	2520-00-692-4901	19207	7709550	CARRIER ASSY,OUTPUT	EA	1
B-17	7	PADZZ	3120-00-776-7897	19207	7767897	BEARING,WASHER,THRUST	EA	1
B-17	8	XADDD		19207	7709695	CARRIER	EA	1
B-17	9	PADZZ	5315-00-776-7621	19207	7767621	PIN	EA	2
B-17	10	XADZZ		19207	7709692	CARRIER	EA	1
B-17	11	XADZZ		19207	7709533	SHAFT	EA	1
B-17	12	PADZZ	5306-00-292-4587	21450	9409046	BOLT,SELF-LOCKING	EA	6
B-17	13	KDDZZ	3120-00-776-7637	19207	7767637	BEARING,WASHER,THRUST PART OF KIT PN 7710893	EA	8
B-17	14	KDDZZ	3120-00-776-7636	19207	7767636	BEARING,WASHER,THRUST PART OF KIT PN 7710893	EA	8
B-17	15	KDDZZ	3110-00-776-7611	19207	7767611	ROLLER,BEARING OF KIT PN 7710893	EA	44
B-17	16	KDDZZ	2520-00-776-7599	19207	7767599	PINION SET PART OF KIT PN 7710893	EA	1
B-17	17	KDDZZ	5305-00-776-7612	19207	7767612	SETSCREW PART OF KIT PN 7710893	EA	4
B-17	18	KDDZZ	2520-00-776-7608	19207	7767608	SPINDLE PART OF KIT PN 7710893	EA	4
B-17	19	PAHZZ	3020-00-323-8528	19207	7710793	GEAR,SPUR MAY ALSO BE USED ON RH SIDE AS A SUBSTITUE FOR PN 8356078	EA	1
B-17	20	PAHZZ	5315-00-337-6917	19207	7709540	BUTTON,DAMPER,SPRING	EA	16
B-17	21	PAHZZ	5360-00-337-6934	19207	7709667	SPRING,HELICAL,COMPRESSION	EA	8
B-17	22	PBFZZ	2530-01-023-3899	19207	7709693	BLOCK,SPRING SUPPORT	EA	4
B-17	23	PAFZZ	2530-00-623-6881	19207	7709694	SPRING	EA	4
B-17	24	PAFZZ	5306-00-242-8223	96906	MS35764-633	BOLT,SELF-LOCKING	EA	8
B-17	25	PAFZZ	2520-00-776-8012	19207	7768012	RING	EA	1
B-17	26	PAFZZ	3110-00-100-6168	96906	MS19059-63	BALL,BEARING	EA	12
B-17	27	PAFZZ	5305-00-770-7926	19207	7707926	SETSCREW	EA	2
B-17	28	PAFZZ	2520-00-323-8527	19207	7710789	RING,BRAKE	EA	1
B-17	29	PAFZZ	3110-00-100-6151	96906	MS19059-49	BALL,BEARING	EA	247
B-17	30	AFFFF		19207	7710806	PISTON ASSY	EA	1
B-17	31	PAFZZ	5305-00-733-8617	19207	7338617	SCREW,SHOULDERED	EA	4
B-17	32	PAFZZ	2520-00-111-5235	19207	7710804	PISTON	EA	1
B-17	33	PAFZZ	2530-01-023-3904	19207	7710784	BAFFLE,BRAKE,HUB	EA	1
B-17	34	PAFZZ	2530-00-936-7707	19207	7710794	PLATE,BRAKE	EA	1
B-17	35	PAFZZ	2520-00-009-3405	19207	7710792	DISK,BRAKE	EA	6
B-17	36	PAFZZ	2520-00-337-6403	19207	7709285	PLATE,TRANSMISSION	EA	7
B-17	37	PAFZZ	5360-00-776-7999	19207	7767999	SPRING,HELICAL,COMPRESSION	EA	12

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-17	38	PAFZZ	5340-00-321-5954	19207	7709709	BUMPER,RUBBER		EA	2
B-17	39	PAFZZ	2530-00-337-6919	19207	7709551	ANCHOR,BRAKE		EA	1
B-17	40	PAFZZ	5330-00-599-7471	19207	7709674	RUBBER ROUND,SEAL		EA	1
B-17	41	PAFZZ	2530-00-936-7739	19207	7710787	PLATE,BRAKE		EA	1
B-17	42	PAFZZ	5306-00-292-4588	21450	9409033	BOLT,SELF-LOCKING		EA	24
B-17	43	PAFZZ	5306-00-685-3397	96906	MS35764-1068	BOLT,SELF-LOCKING		EA	9
B-17	44	PAFZZ	3020-00-753-9755	19207	7539755	GEAR,SPUR		EA	1
B-17	45	PAFZZ	3020-00-753-9756	19207	7707350	GEAR,SPUR		EA	1
B-17	46	PAFZZ	3110-00-406-1538	19207	8350837	BEARING,ROLLER,CYLINDRICAL		EA	1
B-17		PADZZ	2520-00-319-5920	19207	7710893	PARTS KIT,PINION		EA	V
B-17	13					BEARING,WASHER,THRUST		EA	8
B-17	14					BEARING,WASHER,THRUST		EA	8
B-17	15					ROLLER,BEARING		EA	44
B-17	16					PINION SET		EA	1
B-17	17					SETSCREW		EA	4
B-17	18					SPINDLE		EA	4

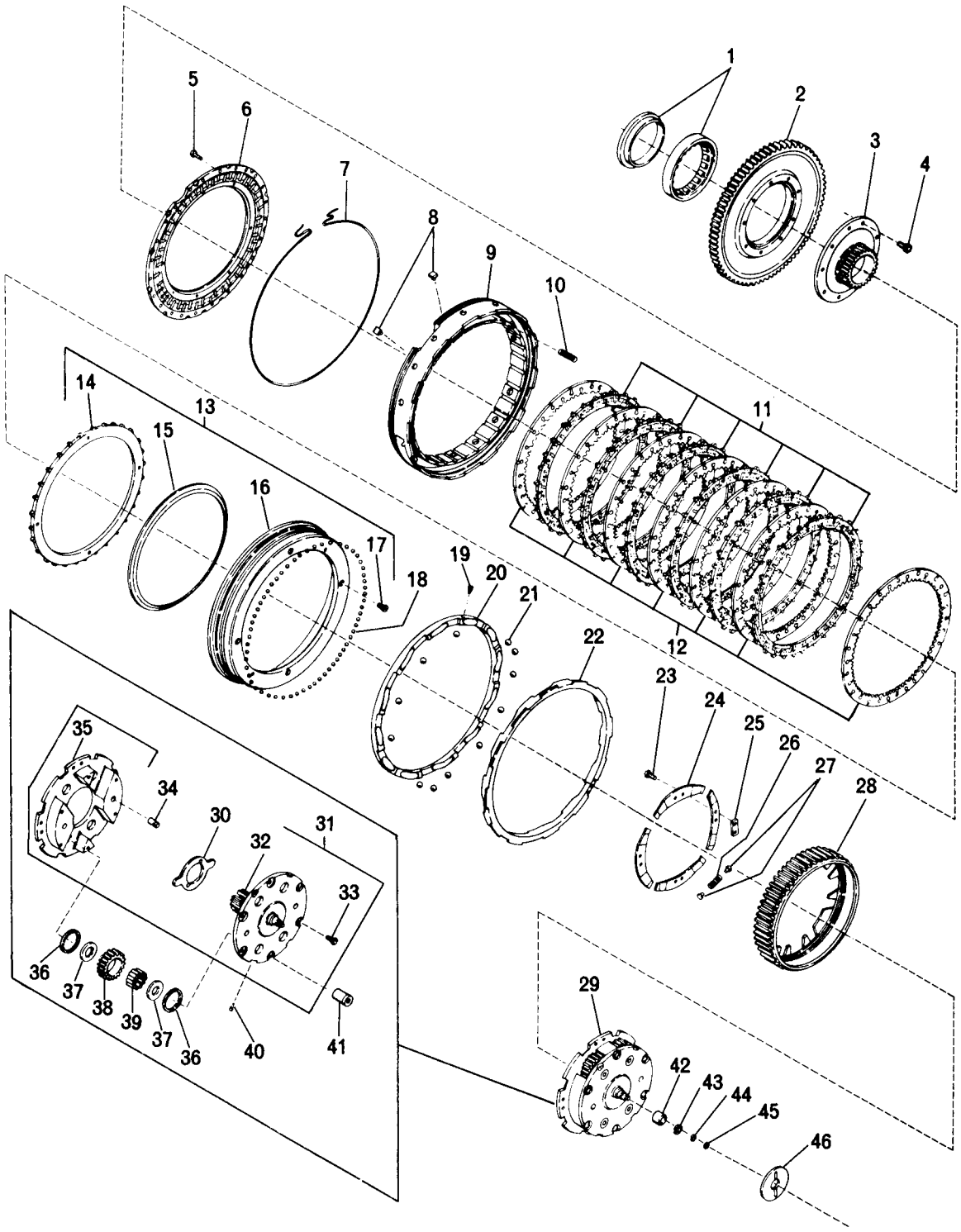

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Figure B-18. Right brake and output planetary

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 0726 BRAKES RIGHT BRAKE AND OUPUT PLANETARY		
B-18	1	PAFZZ	3110-00-406-1538	19207	8350837	BEARING,ROLLER,CYLINDRICAL	EA	1
B-18	2	PAFZZ	3020-00-753-9756	19207	7707350	GEAR,SPUR	EA	1
B-18	3	PAFZZ	3020-00-753-9755	19207	7539755	GEAR,SPUR	EA	1
B-18	5	PAFZZ	5306-00-292-4588	21450	9409033	BOLT,SELF-LOCKING	EA	24
B-18	6	PAFZZ	2530-00-936-7739	19207	7710787	PLATE,BRAKE	EA	1
B-18	7	PAFZZ	5330-00-599-7471	19207	7709674	RUBBER ROUND,SEAL	EA	1
B-18	8	PAFZZ	5340-00-321-5954	19207	7709709	BUMPER,RUBBER	EA	2
B-18	9	PAFZZ	2530-00-337-6922	19207	7709564	ANCHOR,BRAKE	EA	1
B-18	10	PAFZZ	5360-00-776-7999	19207	7767999	SPRING,HELICAL,COMPRESSION	EA	12
B-18	11	PAFZZ	2520-00-009-3405	19207	7710792	DISK,BRAKE	EA	6
B-18	12	PAFZZ	2520-00-337-6403	19207	7709285	PLATE,TRANSMISSION	EA	7
B-18	13	AFFFF		19207	7710806	PISTON ASSY	EA	1
B-18	14	PAFZZ	2530-00-936-7707	19207	7710794	PLATE,BRAKE	EA	1
B-18	15	PAFZZ	2530-01-023-3904	19207	7710784	BAFFLE,BRAKE,HUB	EA	1
B-18	16	PAFZZ	2520-00-111-5235	19207	7710804	PISTON	EA	1
B-18	17	PAFZZ	5305-00-733-8617	19207	7338617	SCREW,SHOULDERED	EA	4
B-18	18	PAFZZ	3110-00-100-6151	96906	MS19059-49	BALL,BEARING	EA	247
B-18	19	PAFZZ	5305-00-770-7926	19207	7707926	SETSCREW	EA	2
B-18	20	PAFZZ	2520-00-323-8529	19207	7710795	RING,BRAKE	EA	1
B-18	21	PAFZZ	3110-00-100-6168	96906	MS19059-63	BALL,BEARING	EA	12
B-18	22	PAFZZ	2520-00-776-8011	19207	7768011	RING	EA	1
B-18	23	PAFZZ	5306-00-242-8223	96906	MS35764-633	BOLT,SELF-LOCKING	EA	8
B-18	24	PAFZZ	2530-00-623-6881	19207	7709694	SPRING	EA	4
B-18	25	PBFZZ	2530-01-023-3899	19207	7709693	BLOCK	EA	4
B-18	26	PAHZZ	5360-00-337-6934	19207	7709667	SPRING,HELICAL,COMPRESSION	EA	8
B-18	27	PAHZZ	5315-00-337-6917	19207	7709540	BUTTON,DAMPER,SPRING	EA	16
B-18	28	PAHZZ	3020-01-144-4868	19207	8356078	GEAR,SPUR MAY NOT BE USED ON LH SIDE AS A SUBSTITUE FOR PN 7710793	EA	1
B-18	29	PAHDD	2520-00-692-4901	19207	7709550	CARRIER ASSY	EA	1
B-18	30	PADZZ	3120-00-776-7897	19207	7767897	BEARING,WASHER,THRUST	EA	1
B-18	31	XADDD		19207	7709695	CARRIER	EA	1
B-18	32	XADZZ		19207	7709533	SHAFT	EA	1
B-18	33	PADZZ	5306-00-292-4587	21450	9409046	BOLT,SELF-LOCKING	EA	6
B-18	34	PADZZ	5315-00-776-7621	19207	7767621	PIN	EA	2
B-18	35	XADZZ		19207	7709692	CARRIER	EA	1
B-18	36	KDDZZ	3120-00-776-7637	19207	7767637	BEARING,WASHER,THRUST PART OF KIT PN 7710893	EA	8
B-18	37	KDDZZ	3120-00-776-7636	19207	7767636	BEARING,WASHER,THRUST PART OF KIT PN 7710893	EA	8

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-18	38	KDDZZ	2520-00-776-7599	19207	7767599	PINION SET PART OF KIT PN 7710893	EA	1
B-18	39	KDDZZ	3110-00-776-7611	19207	7767611	ROLLER,BEARING PART OF KIT PN 7710893	EA	44
B-18	40	KDDZZ	5305-00-776-7612	19207	7767612	SETSCREW PART OF KIT PN 7710893	EA	4
B-18	41	KDDZZ	2520-00-776-7608	19207	7767608	SPINDLE PART OF KIT PN 7710893	EA	4
B-18	42	PAFZZ	3110-00-143-2986	19207	7767623	RACE	EA	1
B-18	43	PAFZZ	5365-00-776-7626	19207	7767626	RING,RETAINING	EA	1
B-18	44	PAFZZ	2520-00-978-0648	19207	8355751	RING,SEAL	EA	1
B-18	46	PAFZZ	3120-00-776-7676	19207	7767676	BEARING,WASHER,THRUST	EA	1
B-18		PADZZ	2520-00-319-5920	19207	7710893	PARTS KIT,PINION	EA	V
B-18	36					BEARING,WASHER,THRUST	EA	8
B-18	37					BEARING,WASHER,THRUST	EA	8
B-18	38					PINION SET	EA	1
B-18	39					ROLLER,BEARING	EA	44
B-18	40					SETSCREW	EA	4
B-18	41					SPINDLE	EA	4

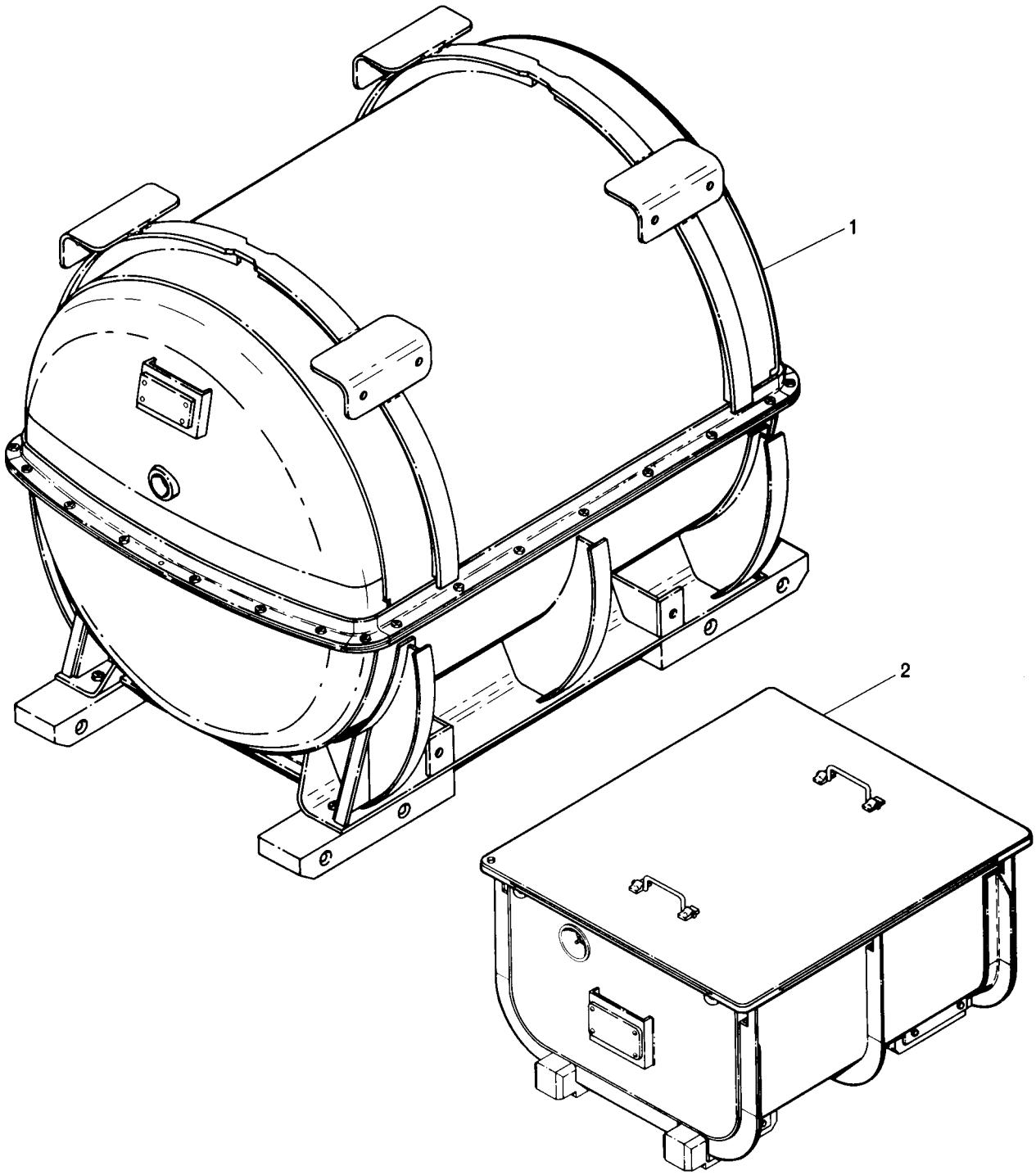

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Figure B-19. Reusable shipping containers

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 33 SPECIAL PURPOSE KITS		
						GROUP: 3301 REUSEABLE SHIPPING CONTAINERS		
B-19	1	PAFFD	8145-00-695-9008	19207	8723296	SHIPPING AND STORAGE CONTAINER ASSY,TRANSMISSION	EA	1
B-19	2	PAFFD	8145-00-856-4997	19207	8351986	SHIPPING AND STORAGE CONTAINER ASSY,END COVER	EA	1

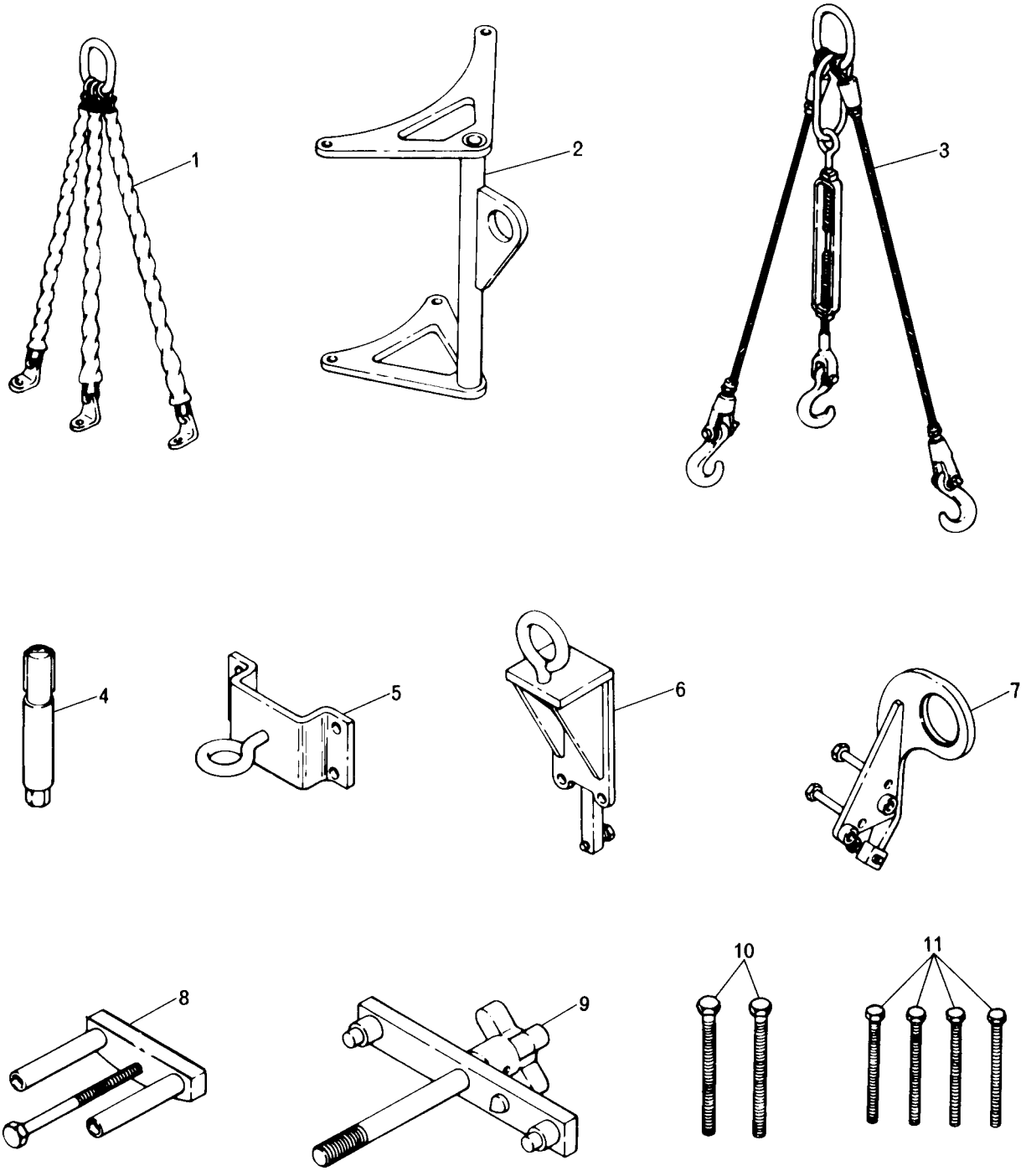

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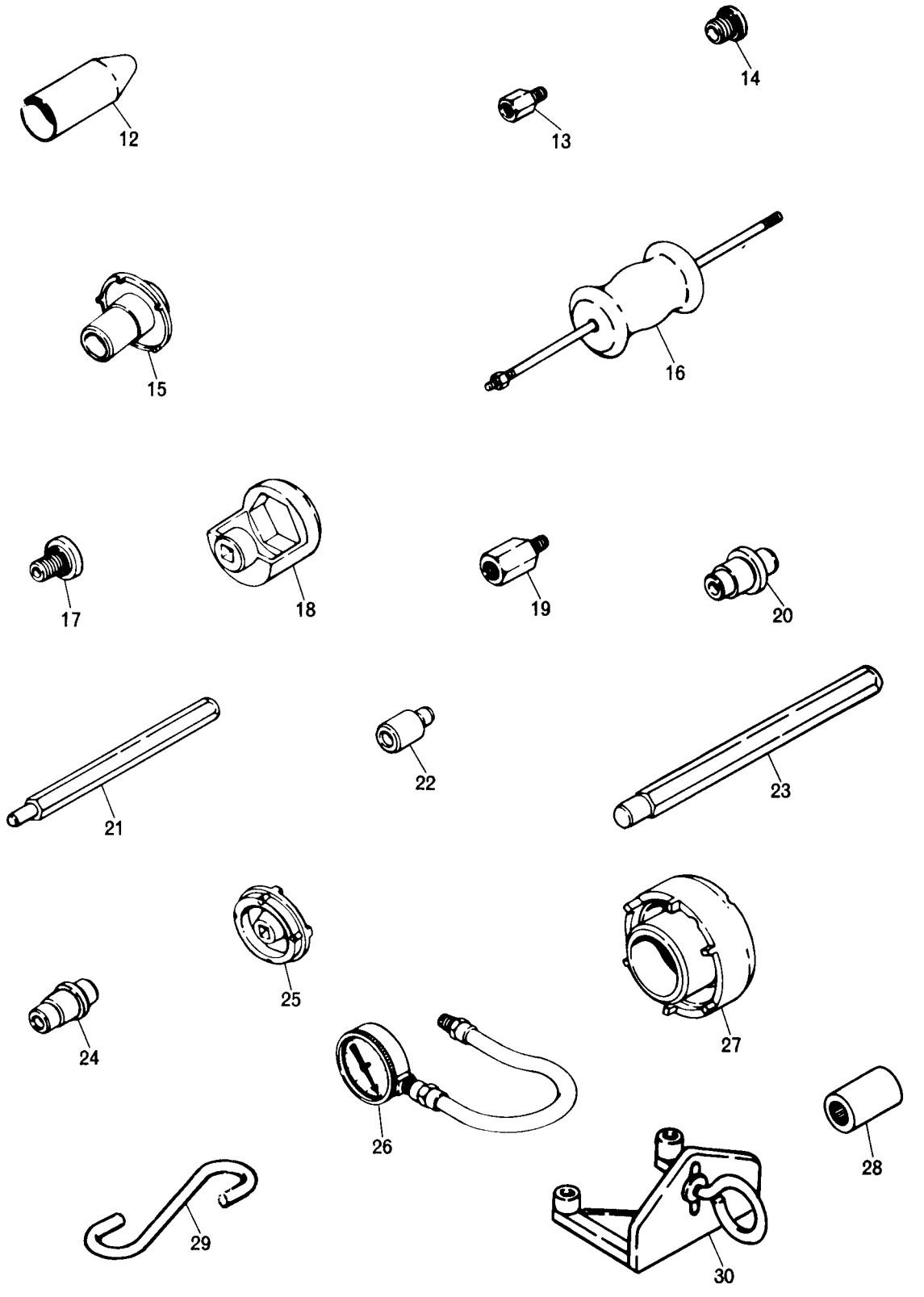
Figure B-20. Special tools (Sheet 1 of 2)

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 26 TOOLS AND TEST EQUIPMENT		
						GROUP: 2604 SPECIAL TOOLS-- FIGURE 1 OF 2		
B-20	1	PEHZZ	4910-00-708-3778	19207	7083778	SLING,LIFTING	EA	1
B-20	2	PEHZZ	4910-00-708-2787	19207	7082787	SLING	EA	1
B-20	3	PEFZZ	4910-00-473-7556	19207	7081593	SLING,LIFTING	EA	2
B-20	4	PEOZZ	5120-00-708-1564	19207	7081564	WRENCH,PINION TURNING	EA	1
B-20	5	PEHZZ	4910-00-473-7035	19207	7081501	ADAPTER,HOISTING,FRONT HOUSING UNIT ASSY	EA	1
B-20	6	PEFZZ	4910-00-708-1580	19207	7081580	SLING	EA	1
B-20	7	PEFZZ	4910-00-610-5963	19207	8350448	ADAPTER,HOISTING	EA	1
B-20	8	PEHZZ	4910-00-070-4888	19207	8356051	REMOVER,ASSEMBLY	EA	3
B-20	9	PEHZZ	4910-00-084-0797	19207	8355779	FIXTURE,BACKLASH SETTING	EA	1
B-20	10	PEFZZ	5120-00-708-3894	19207	7083894	PULLER,MECHANICAL	EA	2
B-20	11	PEFZZ	5306-00-773-7292	19207	7737292	BOLT,MACHINE	EA	4



TA 272419

Figure B-20. Special tools (Sheet 2 of 2)

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 2604 SPECIAL TOOLS-- FIGURE 2 OF 2		
B-20	12	PEFZZ	4910-00-708-1614	19207	7081614	THIMBLE	EA	1
B-20	13	PEOZZ	5120-00-708-2774	19207	7082774	ADAPTER,MECHANICAL PULLER	EA	1
B-20	14	PEFZZ	5120-00-708-2980	19207	7082980	REPLACER,BEARING	EA	1
B-20	15	PEHZZ	5120-00-658-2257	19207	8350702	SOCKET,WRENCH,FACE	EA	1
B-20	16	PEFZZ	5120-00-473-7352	19207	7082201	PULLER,ATTACHMENT	EA	1
B-20	17	PEHZZ	5120-00-473-7388	19207	7082426	REMOVER AND REPLACER,BEARING PULLER	EA	1
B-20	18	PEOZZ	5120-00-626-1842	19207	7003946	SOCKET,SOCKET WRENCH	EA	1
B-20	19	PEHZZ	5120-00-708-3673	19207	7083673	ADAPTER,MECHANICAL PULLER	EA	1
B-20	20	PEFZZ	5120-00-708-2982	19207	7082982	REPLACER,BEARING	EA	1
B-20	21	PEFZZ	5120-00-708-2196	19207	7082196	HANDLE,REMOVER AND REPLACER	EA	1
B-20	22	PEFZZ	5120-00-708-2981	19207	7082981	REPLACED,BEARING	EA	1
B-20	23	PEFZZ	5120-00-473-7121	19207	7082881	HANDLE,REMOVER AND REPLACER	EA	1
B-20	24	PEHZZ	5120-00-473-7460	19207	7082480	REPLACER,GEAR	EA	1
B-20	25	PEHZZ	5120-00-092-9069	19207	8390286	WRENCH,SPANNER	EA	1
B-20	26	PEOZZ	6620-00-795-0330	19207	7950330	GAGE,PRESSURE,DIAL	EA	1
B-20	27	PEFZZ	5120-00-658-2258	19207	8350703	SOCKET,WRENCH,FACE	EA	1
B-20	28	PEHZZ		19207	11650096	ADAPTER,BRAKE APPLY	EA	1
B-20	29	PEHZZ		19207	11650102	S-HOOK	EA	2
B-20	30	PEHZZ		19207	11650103	BRACKET ASSY,END COVER LIFTING	EA	1

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.
2520-00-009-3405	B-17	35
2520-00-009-3405	B-18	11
5310-00-010-3028	B-4	23
5310-00-010-3028	B-5	2
5310-00-010-3028	B-6	79
5310-00-010-3320	B-14	43
5310-00-010-3322	B-13	19
5310-00-010-3323	B-4	25
5315-00-010-3726	B-7	18
5315-00-010-3731	B-7	25
5340-00-012-5647	B-5	39
5340-00-012-5647	B-6	11
5315-00-014-1189	B-16	36
5315-00-014-1205		6
5315-00-014-1212	B-16	37
5315-00-014-1226	B-9	9
5315-00-014-1234	B-9	14
5315-00-014-1240	B-12	55
5315-00-014-1247	B-5	32
5315-00-014-1247	B-6	19
5315-00-014-1260	B-5	35
5315-00-014-1260	B-6	15
5315-00-014-1260	B-9	16
5315-00-014-1281	B-16	6
5305-00-018-1392	B-13	20
4730-00-018-9566	B-12	10
4730-00-018-9566	B-12	46
5306-00-022-1950	B-5	73
5306-00-022-1950	B-6	41
5306-00-022-1950	B-15	7
4730-00-025-7508	B-9	48
2520-00-039-7689	B-5	
2520-00-039-7689	B-6	
2520-00-039-7690	B-13	30
5310-00-039-8452	B-12	59
5330-00-039-8453	B-12	60
5315-00-044-1318	B-12	53
5307-00-064-3692	B-4	50
5305-00-068-0513	B-12	19
4910-00-070-4888	B-20	8
2520-00-073-5412	B-5	64
2520-00-073-5412	B-6	45
2520-00-073-5412	B-8	16
2520-00-073-5412	B-13	16
2520-00-073-5412	B-16	1
5310-00-080-6004	B-14	66
4910-00-084-0797	B-20	9
2520-00-086-7791	B-1	1
2520-00-086-7792	B-1	0
5360-00-088-4547	B-12	33
5365-00-088-5243	B-12	38
5365-00-088-5244	B-12	37
5330-00-088-5245	B-12	32
5365-00-088-5246	B-12	36
5360-00-088-6263	B-12	34
5120-00-092-9069	B-20	25
2520-00-092-9296	B-7	19
3110-00-100-6151	B-17	29
3110-00-100-6151	B-18	18
3110-00-100-6168	B-17	26
3110-00-100-6168	B-18	21
3110-00-100-6176	B-15	4
3110-00-100-6176	B-16	45
5330-00-102-3651	B-3	4
5330-00-102-3651	B-14	45
5340-00-103-4217	B-16	11
5360-00-104-2452	B-10	27
2520-00-111-5235	B-17	32
2520-00-111-5235	B-18	16
3110-00-112-5889	B-14	4
2520-00-133-9636	B-2	2
2520-00-133-9636	B-4	8
3110-00-142-6040	B-12	62
3110-00-143-2986	B-17	5
3110-00-143-2986	B-18	42
3120-01-144-8850	B-4	29
3110-00-155-8992	B-7	64
3110-00-156-7924	B-9	31
3110-00-157--531	B-13	31
3110-00-159-9347	B-9	32
5310-00-174-7429	B-7	67
5340-00-178-1403	B-4	45
5365-00-178-6598	B-7	46
3110-00-183-6723	B-11	37
3110-00-184-8655	B-15	8
3110-00-184-8655	B-16	40
3110-00-185-0139	B-7	23
2520-00-191-1011	B-12	39
5310-00-194-7256	B-12	5
5310-00-194-7256	B-13	12
3110-00-195-0454	B-8	14
4730-00-195-6022	B-12	45
5306-00-206-1314	B-5	20
5306-00-206-1314	B-6	73
5306-00-225-8496	B-4	46
3110-00-227-2159	B-5	58
3110-00-227-2159	B-6	50
3110-00-227-3982	B-7	44
2520-00-234-1140	B-15	16
2520-00-234-1140	B-16	23
2520-00-239-3463	B-15	18
2520-00-239-3463	B-16	20
2520-00-239-3463	B-10	26
5306-00-242-8223	B-17	24
5306-00-242-8223	B-18	23
2520-00-248-1052	B-15	20
2520-00-248-1052	B-16	19
5305-00-253-5615	B-4	6
5310-00-261-7340	B-13	6
5305-00-269-3213	B-14	49
5305-00-269-4530	B-5	11
5305-00-269-4530	B-6	3
5315-00-276-0092	B-5	70
5315-00-276-0092	B-6	34
3110-00-277-0274	B-9	42
5365-00-282-7402	B-13	29
4730-00-287-3714	B-4	2
5330-00-291-2438	B-5	41
5330-00-291-2438	B-6	9
5306-00-292-4585	B-8	12
5306-00-292-4586	B-7	36
5306-00-292-4587	B-17	12
5306-00-292-4587	B-18	33
5306-00-292-4588	B-17	42
5306-00-292-4588	B-18	5
5306-00-292-4590	B-5	48
5306-00-292-4590	B-5	59
5306-00-292-4590	B-6	49
5306-00-292-4590	B-6	54
5306-00-292-4592	B-10	9
5306-00-292-4593	B-15	22
5306-00-292-4593	B-16	17
5306-00-292-4594	B-9	17
5306-00-292-5340	B-10	1
9505-00-293-4208	B-14	64
5330-00-297-6439	B-12	9
2520-00-302-1043	B-12	57
2520-00-319-5920	B-10	
2520-00-319-5920	B-11	
2520-00-319-5920	B-17	
2520-00-319-5920	B-18	
5340-00-321-5954	B-17	38
5340-00-321-5954	B-18	8
5360-00-321-5955	B-12	26
5360-00-321-6135	B-4	43
2520-00-323-8527	B-17	28
3020-00-323-8528	B-17	19
2520-00-323-8529	B-18	20
2520-00-323-8530	B-7	37
3020-00-323-8531	B-8	6
2520-00-323-8532	B-15	
2520-00-323-8532	B-16	
2520-00-323-8533	B-10	
2520-00-333-3523	B-5	5
2520-00-333-3524	B-17	1
2520-00-337-6403	B-17	36
2520-00-337-6403	B-18	12
2530-00-337-6883	B-16	2
2520-00-337-6885	B-15	6
2520-00-337-6885	B-16	28
2520-00-337-6908	B-15	1
2530-00-337-6909	B-15	23
2530-00-337-6909	B-16	16

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.	STOCK NUMBER	FIGURE NO.	ITEM NO.
2530-00-337-6915	B-15	24	2520-00-673-2973	B-3	1
2530-00-337-6915	B-16	15	3020-00-679-4490	B-9	33
2520-00-337-6916	B-16	43	3020-00-679-4491	B-9	43
5315-00-337-6917	B-17	20	2530-00-679-4495	B-10	35
5315-00-337-6917	B-18	27	2530-00-679-4495	B-11	21
2520-00-337-6918	B-5	49	2520-00-679-4497	B-7	34
2520-00-337-6918	B-6	51	5306-00-685-3397	B-17	43
2530-00-337-6919	B-17	39	5306-00-685-3397	B-18	4
2530-00-337-6922	B-18	9	5935-00-687-2046	B-4	27
2530-00-337-6924	B-6	46	5315-00-687-5218	B-14	1
2530-00-337-6925	B-5	60	2520-00-692-4900	B-11	35
2530-00-337-6931	B-15	15	2520-00-692-4901	B-17	6
2530-00-337-6931	B-16	24	2520-00-692-4901	B-18	29
2530-00-337-6933	B-16	33	2520-00-692-4908	B-14	28
5360-00-337-6934	B-17	21	2520-00-692-4910	B-12	15
5360-00-337-6934	B-18	26	2520-00-692-4911	B-4	44
5310-00-402-5220	B-14	29	2520-00-692-4912	B-4	42
5310-00-402-5220	B-14	48	2520-00-692-4913	B-4	41
2520-00-404-7385	B-14	2	5360-00-695-8787	B-14	57
3110-00-406-1530	B-14	32	5360-00-695-8788	B-14	56
3110-00-406-1538	B-7	12	2995-00-695-8789	B-14	59
3110-00-406-1538	B-17	46	2940-00-695-8790	B-14	58
3110-00-406-1538	B-18	1	8145-00-695-9008	B-19	1
3110-00-406-1539	B-14	7	5307-00-699-6230	B-4	18
3110-00-406-1539	B-14	13	5307-00-699-6230	B-4	52
3110-00-406-1539	B-14	32	5307-00-699-6231	B-4	18
3110-00-406-1540	B-5	6	5307-00-699-6231	B-4	52
3110-00-406-1540	B-6	7	5307-00-699-6243	B-4	16
2520-00-407-6752	B-14	61	5307-00-699-6244	B-4	16
4730-00-410-6087	B-5	36	5307-00-699-6245	B-4	16
4730-00-410-6087	B-6	14	5120-00-708-1564	B-20	4
3020-00-431-3407	B-15	30	4910-00-708-1580	B-20	6
2520-00-431-3408	B-7	69	4910-00-708-1614	B-20	12
2520-00-431-3411	B-14	44	5120-00-708-2196	B-20	21
5315-00-432-2148	B-15	28	5120-00-708-2774	B-20	13
2520-00-463-5877	B-14	10	4910-00-708-2787	B-20	2
2520-00-463-5877	B-14	35	5120-00-708-2980	B-20	14
4910-00-473-7035	B-20	5	5120-00-708-2981	B-20	22
5120-00-473-7121	B-20	23	5120-00-708-2982	B-20	20
5120-00-473-7352	B-20	16	5120-00-708-3673	B-20	19
5120-00-473-7388	B-20	17	4910-00-708-3778	B-20	1
5120-00-473-7460	B-20	24	5120-00-708-3894	B-20	10
4910-00-473-7556	B-20	3	3120-00-711-5828	B-12	8
5310-00-492-6066	B-4	58	4710-00-712-2989	B-3	7
5330-00-514-3289	B-13	14	3120-00-717-6018	B-9	28
2520-00-516-4624	B-14	52	3120-00-717-6038	B-9	27
5306-00-559-0484	B-5	10	3120-00-717-6039	B-9	25
5306-00-559-0484	B-6	4	2520-00-722-8878	B-3	5
2520-00-561-9961	B-12	23	5310-00-723-2737	B-14	42
5330-00-561-9965	B-12	70	5310-00-724-2453	B-12	27
2520-00-561-9967	B-12	65	5310-00-725-7382	B-11	34
2530-00-563-4472	B-16	31	5310-00-725-7382	B-12	2
5307-00-567-4129	B-4	54	5310-00-725-7382	B-13	7
3110-00-569-0012	B-7	65	5310-00-725-7382	B-14	65
5360-00-569-8447	B-12	24	2520-00-732-4014	B-6	40
3020-00-572-4822	B-14	30	5305-00-733-8617	B-17	31
5330-00-579-8108	B-5	42	5305-00-733-8617	B-18	17
5330-00-579-8108	B-6	78	2530-00-734-8761	B-5	55
5330-00-579-8108	B-7	6	2530-00-734-8761	B-6	63
5310-00-582-5965	B-12	18	2520-00-737-1931	B-4	9
5330-00-591-3449	B-5	79	2520-00-737-1932	B-4	10
5330-00-591-3449	B-6	31	5315-00-737-3455	B-5	69
5360-00-597-0773	B-12	61	5315-00-737-3455	B-6	36
5360-00-597-1225	B-12	66	2520-00-737-3456	B-5	66
5330-00-599-7471	B-17	40	2520-00-737-3456	B-6	42
5330-00-599-7471	B-18	7	5306-00-737-3457	B-5	63
4910-00-610-5963	B-20	7	5306-00-737-3457	B-6	44
2530-00-623-6881	B-17	23	2520-00-737-3561	B-7	39
2530-00-623-6881	B-18	24	2520-00-737-4143	B-11	11
5120-00-626-1842	B-20	18	5310-00-737-6765	B-5	65
5307-00-637-0686	B-4	54	5310-00-737-6765	B-6	43
5307-00-637-9986	B-4	54	5307-00-737-8743	B-4	18
4730-00-647-3207	B-14	2B	5307-00-737-8743	B-4	52
4730-00-653-7073	B-4	12	5307-00-752-0610	B-4	51
4730-00-653-7073	B-4	35	5307-00-752-0614	B-4	11
2520-00-653-9518	B-8	15	5307-00-752-0615	B-4	11
2520-00-653-9519	B-7	61	5307-00-752-0616	B-4	11
5120-00-658-2257	B-20	15	5307-00-752-0621	B-4	39
5120-00-658-2258	B-20	27	5307-00-752-0625	B-4	38
2530-00-658-4086	B-10	34	5307-00-752-0626	B-4	38
2520-00-673-2972	B-3		5307-00-752-0627	B-4	38

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.	STOCK NUMBER	FIGURE NO.	ITEM NO.
5307-00-752-0644	B-4	53	5365-00-770-8009	B-12	47
5307-00-752-0645	B-4	53	2520-00-770-8010	B-12	50
5307-00-752-0646	B-4	53	5310-00-770-8035	B-12	40
3120-00-752-1411	B-15	3	5330-00-770-8078	B-3	2
3120-00-752-1411	B-15	11	2520-00-770-8099	B-5	43
3120-00-752-1411	B-16	39	2520-00-770-8099	B-6	55
3120-00-752-1411	B-16	46	2520-00-770-8103	B-12	68
5330-00-752-1413	B-7	4	5365-00-770-8104	B-7	55
5330-00-752-1413	B-14	22	5360-00-770-8105	B-12	67
5315-00-752-1416	B-12	64	5310-00-770-8107	B-12	69
5330-00-752-1420	B-7	8	5360-00-770-8109	B-12	20
5360-00-752-1423	B-7	45	2520-00-770-8111	B-12	63
2520-00-752-1426	B-7	7	2520-00-770-8114	B-7	38
2520-00-752-1427	B-7	5	5365-00-770-8117	B-7	56
2520-00-752-1427	B-14	23	2520-00-770-8121	B-7	14
5306-00-752-1457	B-7	57	5330-00-770-8123	B-3	10
2520-00-752-1460	B-7	9	2520-00-770-8133	B-14	27
5310-00-752-1461	B-14	29	3020-00-771-5620	B-10	22
5360-00-752-1771	B-12	43	5306-00-773-7292	B-20	11
3110-00-752-7800	B-9	37	5360-00-774-5575	B-12	49
3110-00-752-7810	B-9	36	2520-00-776-7510	B-10	20
2520-00-753-9702	B-13	2	3120-00-776-7512	B-11	7
5330-00-753-9712	B-10	31	5313-00-776-7514	B-10	32
2520-00-753-9738	B-9	49	5315-00-776-7515	B-10	29
2520-00-753-9738	B-16	29	5365-00-776-7532	B-12	6
2520-00-753-9739	B-15	13	2520-00-776-7535	B-12	51
2520-00-753-9739	B-16	26	5360-00-776-7539	B-12	13
5340-00-753-9750	B-4	37	2520-00-776-7541	B-12	54
2520-00-753-9754	B-7	30	5365-00-776-7548	B-12	31
3020-00-753-9755	B-17	44	2520-00-776-7549	B-12	11
3020-00-753-9755	B-18	3	5365-00-776-7550	B-12	30
3020-00-753-9756	B-17	45	5307-00-776-7552	B-4	38
3020-00-753-9756	B-18	2	5315-00-776-7554	B-12	28
3120-00-753-9848	B-15	25	2520-00-776-7556	B-4	30
3120-00-753-9848	B-16	14	2520-00-776-7557	B-12	14
5310-00-753-9851	B-16	48	2520-00-776-7563	B-12	17
2520-00-753-9856	B-7	1	5330-00-776-7565	B-12	12
2520-00-753-9860	B-15	29	5330-00-776-7568	B-12	29
3020-00-753-9882	B-16	13	2520-00-776-7570	B-10	23
2520-00-753-9884	B-15	21	2520-00-776-7574	B-10	25
2520-00-753-9884	B-16	18	2520-00-776-7574	B-15	19
2520-00-753-9886	B-15	26	2520-00-776-7574	B-16	21
5310-00-753-9887	B-9	41	3020-00-776-7575	B-10	17
2520-00-753-9891	B-12	44	5307-00-776-7579	B-4	18
2520-00-754-0472	B-6	33	5307-00-776-7579	B-4	52
2520-00-754-0473	B-5	67	5307-00-776-7580	B-4	51
5310-00-754-0474	B-9	30	2520-00-776-7597	B-11	9
3020-00-762-4502	B-14	47	5315-00-776-7598	B-11	32
5330-00-770-7232	B-14	51	2520-00-776-7599	B-10	15
2520-00-770-7238	B-9	35	2520-00-776-7599	B-11	17
5315-00-770-7239	B-9	20	2520-00-776-7599	B-17	16
5315-00-770-7239	B-16	35	2520-00-776-7599	B-18	38
5365-00-770-7240	B-9	29	2520-00-776-7601	B-11	10
5330-00-770-7245	B-5	28	2520-00-776-7602	B-11	5
5330-00-770-7245	B-6	21	2520-00-776-7603	B-11	30
2520-00-770-7325	B-5	78	3120-00-776-7607	B-11	4
2520-00-770-7325	B-6	30	2520-00-776-7608	B-10	10
5365-00-770-7326	B-5	72	2520-00-776-7608	B-11	20
5365-00-770-7326	B-6	32	2520-00-776-7608	B-17	18
2520-00-770-7682	B-7	60	2520-00-776-7608	B-18	41
2520-00-770-7683	B-7	51	3120-00-776-7609	B-10	21
2520-00-770-7685	B-7	58	3120-00-776-7609	B-11	8
5365-00-770-7751	B-13	15	3120-00-776-7610	B-11	29
5310-00-770-7786	B-12	48	3110-00-776-7611	B-10	14
5310-00-770-7786	B-12	58	3110-00-776-7611	B-11	18
5330-00-770-7806	B-13	24	3110-00-776-7611	B-17	15
5307-00-770-7819	B-4	49	3110-00-776-7611	B-18	39
5307-00-770-7820	B-4	49	5305-00-776-7612	B-10	11
5307-00-770-7821	B-4	49	5305-00-776-7612	B-11	19
5365-00-770-7848	B-8	4	5305-00-776-7612	B-17	17
5365-00-770-7849	B-8	5	5305-00-776-7612	B-18	40
5307-00-770-7875	B-4	47	5306-00-776-7614	B-11	27
5307-00-770-7876	B-4	47	5365-00-776-7615	B-11	1
5307-00-770-7877	B-4	47	5365-00-776-7616	B-11	3
2520-00-770-7909	B-14	31	4730-00-776-7619	B-3	8
2520-00-770-7917	B-14	53	5315-00-776-7621	B-11	12
5305-00-770-7926	B-17	27	5315-00-776-7621	B-17	9
5305-00-770-7926	B-18	19	5315-00-776-7621	B-18	34
2520-00-770-7971	B-14	67	5365-00-776-7625	B-17	2
5310-00-770-7980	B-14	63	5365-00-776-7625	B-18	45
5310-00-770-7981	B-14	62	5365-00-776-7626	B-17	4

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2520-00-776-7629	B-5	27	4730-00-776-7863	B-4	21
2520-00-776-7629	B-6	22	5340-00-776-7866	B-13	18
5305-00-776-7630	B-5	25	3040-00-776-7868	B-13	27
5305-00-776-7630	B-6	24	5330-00-776-7869	B-13	4
5310-00-776-7631	B-5	26	5305-00-776-7870	B-13	8
5310-00-776-7631	B-6	23	5310-00-776-7871	B-13	10
5330-00-776-7633	B-12	16	5310-00-776-7872	B-13	26
5355-00-776-7634	B-12	7	2520-00-776-7874	B-6	2
3120-00-776-7636	B-10	13	2530-00-776-7875	B-5	8
3120-00-776-7636	B-11	16	2530-00-776-7875	B-6	6
3120-00-776-7636	B-17	14	5310-00-776-7880	B-5	80
3120-00-776-7636	B-18	37	5310-00-776-7880	B-6	26
3120-00-776-7637	B-10	12	2520-00-776-7882	B-6	5
3120-00-776-7637	B-11	15	2520-00-776-7889	B-5	53
3120-00-776-7637	B-17	13	2520-00-776-7889	B-6	61
3120-00-776-7637	B-18	36	2520-00-776-7896	B-5	19
3110-00-776-7639	B-7	11	2520-00-776-7896	B-6	74
3020-00-776-7640	B-10	2	3120-00-776-7897	B-17	7
3020-00-776-7640	B-11	28	3120-00-776-7897	B-18	30
2520-00-776-7641	B-10	41	2520-00-776-7994	B-9	4
2520-00-776-7643	B-10	4	5360-00-776-7999	B-17	37
5315-00-776-7645	B-10	5	5360-00-776-7999	B-18	10
2520-00-776-7647	B-10	3	5360-00-776-8000	B-5	54
5305-00-776-7648	B-10	33	5360-00-776-8000	B-6	62
2520-00-776-7654	B-7	43	5365-00-776-8006	B-5	1
2520-00-776-7654	B-7	49	5365-00-776-8006	B-6	80
5305-00-776-7655	B-7	40	2520-00-776-8011	B-18	22
5305-00-776-7655	B-7	52	2520-00-776-8012	B-17	25
2520-00-776-7664	B-7	24	2520-00-776-8034	B-13	5
2520-00-776-7666	B-8	13	5360-00-776-8038	B-13	3
5310-00-776-7667	B-8	11	3120-00-776-8039	B-4	32
5310-00-776-7668	B-7	63	5305-00-776-8048	B-16	3
5310-00-776-7670	B-7	33	5315-00-776-8050	B-16	4
3120-00-776-7676	B-11	39	3120-00-776-8051	B-16	7
3120-00-776-7676	B-18	46	2520-00-776-8057	B-5	71
2520-00-776-7677	B-12	25	2520-00-776-8057	B-6	37
3120-00-776-7679	B-5	40	5310-00-776-8062	B-5	22
3120-00-776-7679	B-6	12	5310-00-776-8062	B-6	76
3120-00-776-7680	B-5	33	2520-00-776-8063	B-5	23
3120-00-776-7680	B-6	18	2520-00-776-8063	B-6	77
2520-00-776-7703	B-5	7	2520-00-776-8068	B-14	3
2520-00-776-7703	B-6	8	2520-00-776-8070	B-14	9
5365-00-776-7704	B-5	3	2520-00-776-8070	B-14	36
5365-00-776-7704	B-6	1	5315-00-776-8073	B-14	34
2520-00-776-7706	B-5	4	5360-00-776-8087	B-15	17
5365-00-776-7715	B-7	2	5360-00-776-8087	B-16	22
5365-00-776-7716	B-7	72	2520-00-776-8091	B-9	18
5310-00-776-7723	B-4	59	3120-00-776-8092	B-15	9
2520-00-776-7724	B-4	60	3120-00-776-8092	B-16	42
5330-00-776-7735	B-14	68	5315-00-776-8094	B-9	19
2520-00-776-7736	B-5	9	5315-00-776-8094	B-16	34
2520-00-776-7743	B-7	35	2520-00-776-8095	B-15	14
5330-00-776-7747	B-7	70	2520-00-776-8095	B-16	25
2520-00-776-7752	B-5	21	5365-00-776-8099	B-15	10
2520-00-776-7752	B-6	72	5365-00-776-8099	B-16	41
2520-00-776-7759	B-5	12	5365-00-776-8100	B-15	12
2520-00-776-7759	B-6	67	5365-00-776-8100	B-16	30
5307-00-776-7768	B-4	11	2520-00-776-8133	B-14	33
3120-00-776-7769	B-7	50	5315-00-776-8164	B-14	6
3120-00-776-7770	B-7	42	5315-00-776-8164	B-14	11
5365-00-776-7771	B-7	66	5315-00-776-8164	B-14	38
2520-00-776-7775	B-7	59	2520-00-777-6759	B-4	3
5306-00-776-7782	B-9	11	2520-00-784-9294	B-7	68
5365-00-776-7787	B-9	34	6620-00-795-0330	B-20	26
2520-00-776-7791	B-9	13	5365-00-800-2844	B-7	47
5365-00-776-7792	B-9	34	5365-00-804-1509	B-14	40
5365-00-776-7794	B-11	36	5310-00-809-3078	B-12	21
2520-00-776-7799	B-9	15	5310-00-809-5998	B-4	22
2520-00-776-7800	B-8	3	5330-00-815-7994	B-4	1
5330-00-776-7838	B-14	18	5307-00-826-2639	B-4	56
2520-00-776-7847	B-13	11	5307-00-826-5603	B-4	55
5365-00-776-7848	B-13	9	5365-00-832-4666	B-5	17
2520-00-776-7849	B-13	32	5365-00-832-4666	B-6	66
5365-00-776-7851	B-13	25	5365-00-832-4666	B-14	14
2520-00-776-7853	B-13	1	5365-00-833-7454	B-14	60
5365-00-776-7855	B-4	4	4730-00-834-0664	B-9	47
5365-00-776-7855	B-13	23	5365-00-838-7706	B-13	21
5330-00-776-7859	B-13	17	5310-00-842-1488	B-12	4
5330-00-776-7860	B-4	5	5315-00-842-3044	B-12	1
5330-00-776-7860	B-13	22	3805-00-847-6847	B-4	17

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4720-00-865-6025	B-3	9
2520-00-886-1206	B-7	29
2520-00-886-1207	B-7	31
5315-00-893-5933	B-13	28
2520-00-896-9022	B-5	0
2520-00-896-9023	B-6	0
5310-00-897-6080	B-5	81
5310-00-897-6080	B-6	27
5306-00-899-4486	B-9	1
3110-00-902-3772	B-5	77
3110-00-902-3772	B-6	29
5305-00-905-3044	B-7	62
4730-00-921-3242	B-3	6
5315-00-922-1669	B-9	26
2530-00-936-7707	B-17	34
2530-00-936-7707	B-18	14
2530-00-936-7739	B-17	41
2530-00-936-7739	B-18	6
3120-00-937-1969	B-15	5
3120-00-937-1969	B-16	44
5306-00-940-5340	B-16	9
5306-00-940-9013	B-14	16
5306-00-940-9013	B-14	20
5306-00-940-9032	B-14	15
5306-00-940-9032	B-14	24
5306-00-940-9032	B-14	41
5306-00-940-9036	B-9	22
5306-00-940-9036	B-16	27
5306-00-940-9036	B-16	38
5306-00-940-9041	B-5	29
5306-00-940-9041	B-6	28
5306-00-940-9049	B-11	14
5306-00-940-9051	B-9	21
5306-00-940-9052	B-8	2
5306-00-940-9060	B-4	57
3110-00-948-9797	B-12	22
2520-00-955-5506	B-7	53
5305-00-959-2723	B-4	33
2520-00-978-0648	B-17	3
2520-00-978-0648	B-18	44
5307-00-978-6062	B-4	19
2520-00-983-6918	B-10	28
5305-00-984-7353	B-7	10
2520-01-006-9622	B-7	16
4730-01-018-1755	B-9	45
2520-01-019-0798	B-7	59
5365-01-020-6297	B-4	36
2520-01-021-2254	B-12	52
2520-01-022-9748	B-2	1
2520-01-022-9748	B-12	3
5315-01-023-3881	B-7	21
2530-01-023-3899	B-17	22
2530-01-023-3899	B-18	25
2530-01-023-3904	B-17	33
2530-01-023-3904	B-18	15
9905-01-032-5057	B-4	7
4730-01-035-7544	B-9	46
4710-01-036-3332	B-14	17
2520-01-037-6880	B-5	37
2520-01-037-6880	B-6	13
2520-01-040-4991	B-14	21
2520-01-040-4992	B-7	41
3040-01-040-5090	B-14	8
5365-01-040-5253	B-5	31
5365-01-040-5253	B-6	20
4710-01-040-5299	B-9	2
4710-01-040-7419	B-9	44
2530-01-042-3999	B-15	27
2530-01-043-5333	B-5	74
2530-01-043-5333	B-6	38
5306-01-043-5701	B-10	16
5340-01-044-2674	B-7	26
3120-01-044-3122	B-15	33
2520-01-044-3237	B-14	12
2520-01-044-3237	B-14	39
5365-01-045-0527	B-5	34
5365-01-045-0527	B-6	16
2520-01-045-3833	B-8	9
2520-01-045-5760	B-12	41
5306-01-045-6594	B-14	19
5315-01-046-0851	B-4	48
5315-01-048-3353	B-10	19
3110-01-049-4829	B-8	1
5360-01-050-2946	B-12	42
2520-01-050-3064	B-7	48
3020-01-056-7562	B-14	37
2520-01-059-1534	B-14	46
5306-01-064-5440	B-13	13
5306-01-066-3529	B-5	18
5306-01-066-3529	B-6	75
5306-01-066-3529	B-7	13
5306-01-066-3529	B-9	3
5306-01-066-3529	B-14	25
5330-01-075-7852	B-5	79
5330-01-075-7852	B-6	31
2520-01-076-3757	B-9	5
2520-01-121-1223	B-3	3
5306-01-137-9712	B-7	32
5306-01-137-9712	B-9	40
5306-01-137-9712	B-9	50
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2520-01-138-7070	B-6	10
5307-01-143-9251	B-4	50
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5307-01-143-9253	B-4	19
3020-01-144-4868	B-18	28
2940-01-144-4884	B-14	54
5307-01-144-8866	B-4	56
5307-01-144-8868	B-4	55
5307-01-144-8870	B-4	50
4710-01-144-8883	B-14	55
5307-01-145-1647	B-4	55
2520-01-146-1870	B-14	2A
2520-01-146-1871	B-14	31A
4820-01-146-1886	B-14	27
2520-01-146-1893	B-10	40A
2520-01-146-1893	B-11	26
2520-01-146-1894	B-10	40
2520-01-146-1894	B-11	26A
4710-01-146-1899	B-14	26
5340-01-146-1906	B-14	46A
3020-01-146-8957	B-14	30
3010-01-146-7210	B-7	58A
2520-01-159-6214	B-1	NI
2520-01-163-1431	B-1	1
5310-01-261-7340	B-11	33
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60380	B1812	B-6	29
60380	GB1112	B-14	4
96906	MS15795-14	B-14	66
96906	MS15795-215	B-12	5
96906	MS15795-215	B-13	12
96906	MS16625-1093	B-14	60
96906	MS16625-137	B-5	17
96906	MS16625-137	B-6	66
96906	MS16625-137	B-14	14
96906	MS16625-143	B-13	21
96906	MS16625-3137	B-14	40
96906	MS17131-27	B-5	58
96906	MS17131-27	B-6	50
96906	MS19059-49	B-17	29
96906	MS19059-49	B-18	18
96906	MS19059-63	B-17	26
96906	MS19059-63	B-18	21
96906	MS19059-86	B-7	54
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96906	MS19059-86	B-16	45
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96906	MS20995C32	B-14	64	19207	11650010	B-7	59
96906	MS21318-21	B-4	6	19207	11650030	B-14	17
96906	MS24665-283	B-12	1	19207	11650031	B-14	46
96906	MS27183-18	B-4	22	19207	11650033	B-4	7
96906	MS35191-306	B-7	10	24617	11650042	B-7	58A
96906	MS35237-118	B-4	33	19207	11650070	B-14	2C
96906	MS35295-62	B-14	49	19207	11650078	B-4	30
96906	MS35296-77	B-5	11	19207	11650079	B-14	27
96906	MS35296-77	B-6	3	19207	11650081	B-9	8A
96906	MS35304-6	B-12	19	19207	11650086	B-14	46A
96906	MS35338-10	B-4	25	19207	11650088	B-10	40
96906	MS35338-6	B-12	18	19207	11650088	B-11	26
96906	MS35338-7	B-14	43	19207	11650089	B-10	40A
96906	MS35338-8	B-11	33	19207	11650089	B-11	26A
96906	MS35338-8	B-13	6	19207	11650096	B-20	28
96906	MS35338-8	B-14	50	19207	11650102	B-20	29
96906	MS35338-9	B-13	19	19207	11650103	B-20	30
96906	MS35690-524	B-14	42	19207	11650107	B-2	4
96906	MS35690-624	B-11	34	19207	11650107	B-7	3
96906	MS35690-624	B-12	2	19207	11650111	B-1	1
96906	MS35690-624	B-13	7	19207	11650135	B-9	7
96906	MS35690-624	B-14	65	19207	11650136	B-9	6
96906	MS35690-824	B-4	23	19207	11650137	B-9	5
96906	MS35690-824	B-5	2	21450	125647	B-5	39
96906	MS35690-824	B-6	79	21450	125647	B-6	11
96906	MS35691-27	B-5	81	24617	141107	B-7	21
96906	MS35691-27	B-6	27	88044	141149	B-5	70
96906	MS35692-21	B-12	4	24617	141149	B-6	34
96906	MS35756-3	B-14	1	21450	141189	B-16	36
96906	MS35764-1068	B-17	43	21450	141205		6
96906	MS35764-1068	B-18	4	21450	141212	B-16	37
96906	MS35764-231	B-13	13	21450	141226	B-9	9
96906	MS35764-232	B-9	1	21450	141234	B-9	14
96906	MS35764-233	B-5	18	21450	141240	B-12	55
96906	MS35764-233	B-6	75	21450	141247	B-5	32
96906	MS35764-233	B-7	13	21450	141247	B-6	19
96906	MS35764-233	B-9	3	21450	141260	B-5	35
96906	MS35764-233	B-14	25	21450	141260	B-6	15
96906	MS35764-617	B-15	22	21450	141260	B-9	16
96906	MS35764-617	B-16	17	21450	141281	B-16	6
96906	MS35764-632	B-5	73	24617	148415	B-13	31
96906	MS35764-632	B-6	41	21450	181392	B-13	20
96906	MS35764-632	B-15	7	80244	22W1630	B-5	64
96906	MS35764-633	B-17	24	80244	22W1630	B-6	45
96906	MS35764-633	B-18	23	80244	22W1630	B-8	16
96906	MS35764-635	B-7	32	80244	22W1630	B-13	16
96906	MS35764-635	B-9	40	21450	22W1630	B-16	1
96906	MS35764-635	B-9	50	19207	22W1631-110	B-5	24
96906	MS35764-635	B-16	10	19207	22W1631-110	B-6	25
96906	MS35764-636	B-5	10	73342	23014066	B-14	2A
96906	MS35764-636	B-6	4	73342	23014082	B-14	31A
96906	MS35764-637	B-10	1	22560	274771	B-16	11
96906	MS35764-637	B-16	9	21450	441318	B-12	53
96906	MS35764-651	B-11	14	19207	444588	B-12	45
96906	MS35764-669	B-4	57	19207	444612	B-12	10
96906	MS35769-21	B-13	14	81240	444654	B-4	17
96906	MS39158-7	B-3	6	81240	444654	B-4	34
96906	MS49005-2	B-12	46	81240	444654	B-9	24
96906	MS51504-B4	B-14	2B	24617	444678	B-4	2
96906	MS51819-37	B-9	46	31007	445751	B-5	36
96906	MS51819-7	B-9	45	31007	445751	B-6	14
96906	MS51823-5	B-9	48	19207	5703086	B-5	0
96906	MS51825-5	B-9	47	19207	5703087	B-6	0
96906	MS51976-47	B-7	62	19207	5703101	B-1	0
96906	MS51990-109P	B-4	36	19207	5703172	B-1	0
96906	MS90725-31	B-4	46	73342	6700685	B-12	7
60380	QP50256	B-10	36	19207	7003946	B-20	18
60380	QP50256	B-11	22	19207	7065811	B-7	41
21450	103726	B-7	18	19207	7081501	B-20	5
21450	103731	B-7	25	19207	7081564	B-20	4
24617	106261	B-12	21	19207	7081580	B-20	6
19207	10900456	B-3	8	19207	7081593	B-20	3
19207	11649924	B-14	2	19207	7081614	B-20	12
19207	11649925	B-14	8	19207	7082196	B-20	21
19207	11649926	B-14	47	19207	7082201	B-20	16
19207	11649930	B-14	29	19207	7082426	B-20	17
19207	11649930	B-14	48	19207	7082480	B-20	24
19207	11649939	B-2	1	19207	7082774	B-20	13
19207	11649939	B-12	3	19207	7082787	B-20	2
19207	11649941	B-12	41	19207	7082881	B-20	23

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FSCM	PART NUMBER	FIGURE NO.	ITEM NO.	FSCM	PART NUMBER	FIGURE NO.	ITEM NO.
19207	7082980	B-20	14	19207	7540472	B-6	33
19207	7082981	B-20	22	19207	7540473	B-5	67
19207	7082982	B-20	20	19207	7540474	B-9	30
19207	7083673	B-20	19	19207	7707232	B-14	51
19207	7083778	B-20	1	19207	7707238	B-9	35
19207	7083894	B-20	10	19207	7707239	B-9	20
21450	709435	B-11	37	19207	7707239	B-16	35
19207	7324014	B-5	75	19207	7707240	B-9	29
19207	7324014	B-6	40	19207	7707245	B-5	28
19207	7338617	B-17	31	19207	7707245	B-6	21
19207	7338617	B-18	17	19207	7707246	B-5	79
19207	7348761	B-5	55	19207	7707246	B-6	31
19207	7348761	B-6	63	19207	7707325	B-5	78
19207	7371931	B-4	9	19207	7707325	B-6	30
19207	7371932	B-4	10	19207	7707326	B-5	72
19207	7371938	B-9	42	19207	7707326	B-6	32
19207	7373455	B-5	69	19207	7707350	B-17	45
19207	7373455	B-6	36	19207	7707350	B-18	2
19207	7373456	B-5	66	19207	7707664	B-7	2
19207	7373456	B-6	42	19207	7707676	B-9	8
19207	7373457	B-5	63	19207	7707682	B-7	60
19207	7373457	B-6	44	24617	7707683	B-7	51
19207	7373561	B-7	39	24617	7707685	B-7	58
19207	7374122	B-12	27	19207	7707686	B-5	13
19207	7374143	B-11	11	19207	7707686	B-6	68
19207	7376765	B-5	65	19207	7707730	B-7	16
19207	7376765	B-6	43	19207	7707751	B-13	15
19207	7520605	B-4	52	19207	7707786	B-12	48
19207	7520606	B-4	18	19207	7707786	B-12	58
19027	7520606	B-4	52	19207	7707806	B-13	24
19207	7520607	B-4	18	19207	7707818	B-4	49
19207	7520607	B-4	52	19207	7707819	B-4	49
19207	7520614	B-4	11	19207	7707820	B-4	49
19207	7520615	B-4	11	19207	7707821	B-4	49
19207	7520616	B-4	11	19207	7707828	B-12	23
19207	7520625	B-4	38	19207	7707834	B-5	45
19207	7520626	B-4	38	19207	7707834	B-6	57
19207	7520627	B-4	38	19207	7707836	B-7	20
19207	7520649	B-4	16	19207	7707840	B-15	30
19207	7520650	B-4	16	19207	7707848	B-8	4
19207	7520651	B-4	16	19207	7707849	B-8	5
19207	7521411	B-15	3	21450	7707854	B-4	27
19207	7521411	B-15	11	19207	7707856	B-4	28
19207	7521411	B-16	39	19207	7707859	B-4	29
19207	7521411	B-16	46	19207	7707874	B-4	47
19207	7521413	B-7	4	19027	7707875	B-4	47
19207	7521413	B-14	22	19207	7707876	B-4	47
19207	7521416	B-12	64	19027	7707877	B-4	47
19207	7521420	B-7	8	19207	7707878	B-8	7
19207	7521423	B-7	45	19207	7707882	B-16	8
24617	7521426	B-7	7	19207	7707884	B-7	48
24617	7521427	B-7	5	19207	7707886	B-15	5
19207	7521427	B-14	23	19207	7707886	B-16	44
19207	7521457	B-7	57	19207	7707892	B-14	5
24617	7521460	B-7	9	19207	7707909	B-14	31
19207	7521461	B-14	29	19207	7707917	B-14	53
19207	7521771	B-12	43	19207	7707918	B-14	54
19207	7539702	B-13	2	19207	7707926	B-17	27
19207	7539712	B-10	31	19207	7707926	B-18	19
19207	7539738	B-9	49	19207	7707964	B-15	32
19207	7539738	B-16	29	19207	7707965	B-4	12
19207	7539739	B-15	13	19207	7707965	B-4	35
19207	7539739	B-16	26	19207	7707971	B-14	67
19207	7539750	B-4	37	19207	7707980	B-14	63
19207	7539754	B-7	30	19207	7707981	B-14	62
19207	7539755	B-17	44	19207	7708009	B-12	47
19207	7539755	B-18	3	19207	7708010	B-12	50
19207	7539848	B-15	25	19207	7708035	B-12	40
19207	7539848	B-16	14	19207	7708040	B-7	71
19207	7539850	B-15	27	19207	7708053	B-11	6
19207	7539851	B-16	48	19207	7708076	B-10	34
19207	7539856	B-7	1	19027	7708078	B-3	2
19207	7539858	B-15	31	19207	7708099	B-5	43
19207	7539859	B-15	33	19207	7708099	B-6	55
19207	7539860	B-15	29	19207	7708101	B-7	17
19207	7539882	B-16	13	19207	7708103	B-12	68
19207	7539884	B-15	21	19207	7708104	B-7	55
19207	7539884	B-16	18	19207	7708105	B-12	67
19207	7539886	B-15	26	19207	7708107	B-12	69
19207	7539887	B-9	41	19207	7708109	B-12	20
19207	7539891	B-12	44	19207	7708111	B-12	63

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19207	7708114	B-7	38	19207	7709549	B-5	49
19207	7708117	B-7	56	19207	7709549	B-6	51
19207	7708121	B-7	14	19207	7709550	B-17	6
19207	7708122	B-13	29	19207	7709550	B-18	29
19207	7708123	B-3	10	19207	7709551	B-17	39
19207	7708127	B-12	70	19207	7709564	B-18	9
19207	7708133	B-14	27	19207	7709598	B-12	24
19207	7708182	B-4	54	19207	7709623	B-12	66
19207	7708183	B-4	54	19207	7709628	B-6	47
19207	7708184	B-4	54	19207	7709629	B-6	46
19207	7708185	B-4	54	19207	7709630	B-5	61
19207	7708258	B-12	52	19207	7709631	B-5	60
19207	7708259	B-12	56	19207	7709644	B-14	28
19207	7708260	B-12	65	19207	7709650	B-9	44
19207	7708262	B-12	57	19207	7709652	B-15	15
19207	7708263	B-12	61	19207	7709652	B-16	24
19207	7708527	B-5		19207	7709654	B-16	33
19207	7708527	B-6		19207	7709667	B-17	21
19207	7708641	B-9	12	19207	7709667	B-18	26
19207	7708649	B-10	8	19207	7709674	B-17	40
19207	7708650	B-11	13	19207	7709674	B-18	7
19207	7708652	B-7	27	19207	7709692	B-17	10
19207	7708683	B-4	53	19207	7709692	B-18	35
19207	7708685	B-5	15	19207	7709693	B-17	22
19207	7708685	B-6	70	19207	7709693	B-18	25
19207	7708697	B-4	51	19207	7709694	B-17	23
19207	7708698	B-4	51	19207	7709694	B-18	24
19207	7708699	B-4	51	19207	7709695	B-17	8
19207	7708709	B-4	39	19207	7709695	B-18	31
19207	7708710	B-4	39	19207	7709709	B-17	38
19207	7708711	B-4	39	19207	7709709	B-18	8
19207	7708716	B-4	53	19207	7709713	B-5	31
19207	7708717	B-4	53	19207	7709713	B-6	20
19207	7708718	B-4	53	19207	7709725	B-12	15
19207	7708922	B-5	74	19207	7709870	B-4	31
19207	7708922	B-6	38	19207	7709871	B-4	44
19207	7709217	B-11	31	19207	7709872	B-4	43
19207	7709255	B-12	59	19207	7709873	B-4	42
19207	7709256	B-12	60	19207	7709874	B-4	41
19207	7709285	B-17	36	19207	7709907	B-12	26
19207	7709285	B-18	12	19207	7709908	B-4	45
19207	7709308	B-13	30	19207	7710225	B-15	28
19207	7709331	B-14	57	19207	7710381	B-10	39
19207	7709333	B-14	56	19207	7710381	B-11	25
19207	7709368	B-5	20	19207	7710782	B-7	46
19207	7709368	B-6	73	19207	7710783	B-7	47
19207	7709369	B-14	59	19207	7710784	B-17	33
19207	7709370	B-14	58	19207	7710784	B-18	15
19207	7709371	B-14	52	19207	7710786	B-7	53
19207	7709391	B-7	22	19207	7710787	B-17	41
19207	7709394	B-6	17	19207	7710787	B-18	6
19207	7709395	B-5	38	19207	7710788	B-10	26
19207	7709396	B-7	19	19207	7710788	B-15	18
19207	7709398	B-16	32	19207	7710788	B-16	20
19207	7709399	B-5	37	19207	7710789	B-17	28
19207	7709399	B-6	13	19207	7710790	B-15	20
19207	7709402	B-2	5	19207	7710790	B-16	19
19207	7709402	B-5	30	19207	7710791	B-15	16
19207	7709403	B-2	3	19207	7710791	B-16	23
19207	7709403	B-6	10	19207	7710792	B-17	35
19207	7709412	B-16	31	19207	7710792	B-18	11
19207	7709429	B-16	2	19207	7710793	B-17	19
19207	7709434	B-15	6	19207	7710794	B-17	34
19207	7709434	B-16	28	19207	7710794	B-18	14
19207	7709439	B-15	2	19207	7710795	B-18	20
19207	7709440	B-15	1	19207	7710804	B-17	32
19207	7709441	B-15	23	19207	7710804	B-18	16
19207	7709441	B-16	16	19207	7710806	B-17	30
19207	7709446	B-15	24	19207	7710806	B-18	13
19207	7709446	B-16	15	19207	7710819	B-10	24
19207	7709449	B-16	43	19207	7710822	B-7	37
19207	7709458	B-16	47	19207	7710826	B-9	39
19207	7709466	B-16	5	19207	7710831	B-8	10
19207	7709533	B-17	11	19207	7710833	B-8	8
19207	7709533	B-18	32	19207	7710834	B-8	6
19207	7709538	B-5	50	19207	7710840	B-9	38
19207	7709538	B-6	52	19207	7710893	B-10	
19207	7709540	B-17	20	19207	7710893	B-11	
19207	7709540	B-18	27	19207	7710893	B-17	
19207	7709546	B-11	38	19207	7710893	B-18	
19207	7709548	B-11	35	19207	7710931	B-9	23

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19207	7710932	B-9	10	19207	7767631	B-6	23
19207	7710933	B-9	5	19207	7767633	B-12	16
19207	7710934	B-9	7	19207	7767636	B-10	13
19207	7710936	B-9	33	19207	7767636	B-11	16
19207	7710937	B-9	43	19207	7767636	B-17	14
19207	7720605	B-4	18	19207	7767636	B-18	37
19207	7737292	B-20	11	19207	7767637	B-10	12
19207	7767508	B-10	19	19207	7767637	B-11	15
19207	7767510	B-10	20	19207	7767637	B-17	13
19207	7767512	B-11	7	19207	7767637	B-18	36
19207	7767514	B-10	32	19207	7767639	B-7	11
19207	7767515	B-10	29	19207	7767640	B-10	2
19207	7767532	B-12	6	19207	7767640	B-11	28
19207	7767533	B-12	9	19207	7767641	B-10	41
19207	7767535	B-12	51	19207	7767643	B-10	4
19207	7767539	B-12	13	19207	7767645	B-10	5
19207	7767541	B-12	54	19207	7767647	B-10	3
19207	7767545	B-12	49	19207	7767648	B-10	33
19207	7767548	B-12	31	19207	7767654	B-7	43
19207	7767549	B-12	11	19207	7767654	B-7	49
19207	7767550	B-12	30	19207	7767655	B-7	40
19207	7767552	B-4	38	19207	7767655	B-7	52
19207	7767553	B-4	39	19207	7767664	B-7	24
19207	7767554	B-12	28	19207	7767666	B-8	13
19207	7767556	B-4	30	19207	7767667	B-8	11
19207	7767557	B-12	14	19207	7767668	B-7	63
19207	7767563	B-12	17	19207	7767670	B-7	33
19207	7767565	B-12	12	19207	7767676	B-11	39
19207	7767568	B-12	29	19207	7767676	B-18	46
19207	7767570	B-10	23	19207	7767677	B-12	25
19207	7767574	B-10	25	19207	7767678	B-12	8
19207	7767574	B-15	19	19207	7767679	B-5	40
19207	7767574	B-16	21	19207	7767679	B-6	12
19207	7767575	B-10	17	19207	7767680	B-5	33
19207	7767579	B-4	18	19207	7767680	B-6	18
19207	7767579	B-4	52	19207	7767703	B-5	7
19207	7767580	B-4	51	19207	7767703	B-6	8
19207	7767581	B-4	48	19207	7767704	B-5	3
19207	7767597	B-11	9	19207	7767704	B-6	1
19207	7767598	B-11	32	19207	7767706	B-5	4
19207	7767599	B-10	15	19207	7767716	B-7	72
19207	7767599	B-11	17	19207	7767723	B-4	59
19207	7767599	B-17	16	19207	7767724	B-4	60
19207	7767599	B-18	38	19207	7767735	B-14	68
19207	7767601	B-11	10	19207	7767736	B-5	9
19207	7767602	B-11	5	19207	7767743	B-7	35
19207	7767603	B-11	30	19207	7767746	B-7	65
19207	7767607	B-11	4	19207	7767747	B-7	70
19207	7767608	B-10	10	19207	7767750	B-7	26
19207	7767608	B-11	20	19207	7767752	B-5	21
19207	7767608	B-17	18	19207	7767752	B-6	72
19207	7767608	B-18	41	73342	7767758	B-5	42
19207	7767609	B-10	21	73342	7767758	B-6	78
19207	7767609	B-11	8	19207	7767758	B-7	6
19207	7767610	B-11	29	19207	7767759	B-5	12
19207	7767611	B-10	14	19207	7767759	B-6	67
19207	7767611	B-11	18	19207	7767768	B-4	11
19207	7767611	B-17	15	19207	7767769	B-7	50
19207	7767611	B-18	39	19207	7767770	B-7	42
19207	7767612	B-10	11	19207	7767771	B-7	66
19207	7767612	B-11	19	19207	7767773	B-7	67
19207	7767612	B-17	17	19207	7767775	B-7	59
19207	7767612	B-18	40	19207	7767777	B-8	9
19207	7767614	B-11	27	19207	7767782	B-9	11
19207	7767615	B-11	1	19207	7767787	B-9	34
19207	7767616	B-11	3	19207	7767791	B-9	13
19207	7767621	B-10	7	19207	7767792	B-9	34
19207	7767621	B-11	12	19207	7767794	B-11	36
19207	7767621	B-17	9	19207	7767799	B-9	15
19207	7767621	B-18	34	19207	7767800	B-8	3
19207	7767623	B-17	5	19207	7767838	B-14	18
19207	7767623	B-18	42	19207	7767847	B-13	11
19207	7767625	B-17	2	19207	7767848	B-13	9
19207	7767625	B-18	45	19207	7767849	B-13	32
19207	7767626	B-17	4	19207	7767850	B-13	28
19207	7767626	B-18	43	19207	7767851	B-13	25
19207	7767629	B-5	27	19207	7767853	B-13	1
19207	7767629	B-6	22	19207	7767855	B-4	4
19207	7767630	B-5	25	19207	7767855	B-13	23
19207	7767630	B-6	24	19207	7767858	B-4	16
19207	7767631	B-5	26	19207	7767859	B-13	17

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19207	7767860	B-4	5	19207	7768095	B-16	25
19207	7767860	B-13	22	19207	7768099	B-15	10
19207	7767862	B-4	15	19207	7768099	B-16	41
19207	7767863	B-4	21	19207	7768100	B-15	12
19207	7767866	B-13	18	19207	7768100	B-16	30
19207	7767868	B-13	27	19207	7768133	B-14	33
19207	7767869	B-13	4	19207	7768164	B-14	6
19207	7767870	B-13	8	19207	7768164	B-14	11
19207	7767871	B-13	10	19207	7768164	B-14	38
19207	7767872	B-13	26	19207	7768166	B-14	30
19207	7767874	B-6	2	19207	7768169	B-14	37
19207	7767875	B-5	8	19207	7950330	B-20	26
19207	7767875	B-6	6	19207	7980318	B-6	35
19207	7767880	B-5	80	19207	7994000	B-5	68
19207	7767880	B-6	26	19207	7994568	B-10	38
19207	7767881	B-5	57	19207	7994568	B-11	24
19207	7767881	B-6	64	19207	7994570	B-10	18
19207	7767882	B-6	5	19207	8344384	B-10	37
19207	7767886	B-5	44	19207	8344384	B-11	23
19207	7767886	B-6	56	19207	8344552	B-10	6
19207	7767888	B-5	76	19207	8344562	B-14	10
19207	7767888	B-6	39	19207	8344562	B-14	35
19207	7767889	B-5	53	21450	8344581	B-4	40
19207	7767889	B-6	61	19207	8347301	B-5	34
19207	7767891	B-5	16	19207	8347301	B-6	16
19207	7767891	B-6	71	19207	8347639	B-5	41
19207	7767892	B-5	46	19207	8347639	B-6	9
19207	7767892	B-5	62	19207	8348268	B-14	55
19207	7767892	B-6	48	19207	8348282	B-3	5
19207	7767892	B-6	58	19207	8348319	B-5	5
19207	7767896	B-5	19	19207	8348320	B-17	1
19207	7767896	B-6	74	19207	8348331	B-15	
19207	7767897	B-17	7	19207	8348331	B-16	
19207	7767897	B-18	30	19207	8348332	B-10	
19207	7767908	B-5	47	19207	8350448	B-20	7
19207	7767908	B-5	51	19207	8350523	B-15	8
19207	7767908	B-6	53	19207	8350523	B-16	40
19207	7767908	B-6	59	19207	8350524	B-8	1
19207	7767910	B-5	48	19207	8350525	B-7	64
19207	7767910	B-6	54	19207	8350526	B-8	14
19207	7767994	B-9	4	19207	8350530	B-2	4
19207	7767999	B-17	37	19207	8350530	B-7	3
19207	7767999	B-18	10	19207	8350561	B-10	35
19207	7768000	B-5	54	19207	8350561	B-11	21
19207	7768000	B-6	62	19207	8350564	B-7	34
19207	7768004	B-5	56	19207	8350565	B-7	69
19207	7768004	B-6	65	19207	8350566	B-8	15
19207	7768006	B-5	1	19207	8350569	B-7	61
19207	7768006	B-6	80	19207	8350580	B-7	68
19207	7768011	B-18	22	19207	8350657	B-4	26
19207	7768012	B-17	25	19207	8350686	B-14	44
19207	7768034	B-13	5	19207	8350702	B-20	15
19207	7768038	B-13	3	19207	8350703	B-20	27
19207	7768039	B-4	32	19207	8350726	B-9	32
19207	7768048	B-16	3	19207	8350826	B-4	1
19207	7768050	B-16	4	19207	8350827	B-7	15
19207	7768051	B-16	7	19207	8350827	B-7	28
19207	7768057	B-5	71	19207	8350830	B-14	7
19207	7768057	B-6	37	19207	8350830	B-14	13
19207	7768058	B-5	52	19207	8350830	B-14	32
19207	7768058	B-6	60	19207	8350831	B-11	2
19207	7768060	B-5	14	19207	8350834	B-16	12
19207	7768060	B-6	69	19207	8350835	B-9	31
19207	7768062	B-5	22	19207	8350837	B-7	12
19207	7768062	B-6	76	19207	8350837	B-17	46
19207	7768063	B-5	23	19207	8350837	B-18	1
19207	7768063	B-6	77	19207	8350839	B-7	23
19207	7768068	B-14	3	19207	8350840	B-5	6
19207	7768070	B-14	9	19207	8350840	B-6	7
19207	7768070	B-14	36	19207	8350844	B-9	37
19207	7768071	B-14	12	19207	8350845	B-9	36
19207	7768071	B-14	39	19207	8350900	B-9	26
19207	7768073	B-14	34	19207	8350901	B-9	28
19207	7768087	B-15	17	19207	8350902	B-9	27
19207	7768087	B-16	22	19207	8350903	B-9	25
19207	7768091	B-9	18	19207	8350965	B-3	3
19207	7768092	B-15	9	19207	8350968	B-3	7
19207	7768092	B-16	42	19207	8350969	B-3	1
19207	7768094	B-9	19	19207	8351025	B-3	
19207	7768094	B-16	34	19207	8351029	B-14	26
19207	7768095	B-15	14	19207	8351057	B-10	30

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

FSCM	PART NUMBER	FIGURE NO.	ITEM NO.	FSCM	PART NUMBER	FIGURE NO.	ITEM NO.
19207	8351058	B-10	28	19207	8355833	B-2	2
19207	8351059	B-10	22	19207	8355833	B-4	8
19207	8351088	B-4	3	19207	8355848	B-4	20
19207	8351104	B-4	56	19207	8356031	B-14	21
19207	8351105	B-4	56	19207	8356051	B-20	8
19207	8351106	B-4	56	19207	8356078	B-18	28
19207	8351107	B-4	56	19207	8356138	B-9	2
19207	8351108	B-4	55	19207	8356163	B-14	61
19207	8351109	B-4	55	19207	8356205	B-4	58
19207	8351110	B-4	55	19207	8357269	B-3	4
19207	8351111	B-4	55	19207	8357269	B-14	45
19207	8351130	B-3	9	19207	8357270	B-10	27
19207	8351986	B-19	2	19207	8376257	B-7	44
19207	8351988	B-7	31	19207	8390286	B-20	25
19207	8352004	B-7	29	19207	8723296	B-19	1
19207	8355713	B-4	50	24617	9409007	B-8	12
19207	8355714	B-4	50	24617	9409009	B-7	36
19207	8355715	B-4	50	19207	9409013	B-14	16
19207	8355716	B-4	50	19207	9409013	B-14	20
19207	8355736	B-9	6	24617	9409015	B-14	19
19207	8355751	B-17	3	21450	9409032	B-14	15
19207	8355751	B-18	44	21450	9409032	B-14	24
19207	8355779	B-20	9	21450	9409032	B-14	41
19207	8355802	B-12	38	21450	9409033	B-17	42
19207	8355803	B-12	37	21450	9409033	B-18	5
19207	8355804	B-12	39	21450	9409036	B-9	22
19207	8355805	B-12	35	21450	9409036	B-16	27
19207	8355806	B-12	34	21450	9409036	B-16	38
19207	8355807	B-12	33	21450	9409041	B-5	29
19207	8355808	B-12	32	21450	9409041	B-6	28
19207	8355811	B-12	36	21450	9409042	B-5	59
19207	8355812	B-4	19	24617	9409042	B-6	49
19207	8355813	B-4	19	21450	9409046	B-17	12
19207	8355814	B-4	19	21450	9409046	B-18	33
19207	8355815	B-4	19	21450	9409048	B-10	9
19207	8355817	B-4	24	21450	9409050	B-9	17
19207	8355830	B-1	1	21450	9409051	B-9	21
19207	8355831	B-4	14	19207	9409052	B-8	2
19207	8355832	B-4	13	24617	9422502	B-10	16

(1)	(2)	(3)	(4)	(5)
Item Number	Level	National Stock Number	Description	U/M
1	F		CEMENT (19207) 8355739	QT
2	F		CEMENT (19207) 8355741	QT
3	F		SEALER (19207) 8355740	QT
4	F		OIL, GRADE 10 MIL-L-2104 (19207)	QT
5	F		OIL,ARCTIC MIL-L-46167 (19207)	QT
6	F		OIL, BREAK-IN, SHIPPING AND STORAGE, MIL-L-21260, GRADE 1	QT
7	F		SEALER, NO. 2 PERMATEX (73342) 6772625	QT
8	F		SEALER, NO. 3 PERMATEX (73342) 6758918	QT
9	F		PRIMER, ZINC CHROMATE MIL-TT-P-666 (73342) 6773440	QT
10	F		ENAMEL, WHITE MIL TT-E=489, CLASS A (73342) 6773441	QT
11	F		THINNER, GRADE A MIL TT-X-916 (73342) 6773927	QT

(1)	(2)	(3)	(4)	(5)
Item Number	Level	National Stock Number	Description	U/M
12	F		THINNER MIL TT-T538 (73342) 6774318	QT
13	F		PETROLATUM MIL VV-P-236 (77342) 6774556	QT
14	F		GREASE, HIGH TEMP MIL-G-3545 (73342) 6774557	QT
15	F		COMPOUND, CORROSION PREVENTATIVE MIL-C-16173 (77342) 6774632	QT
16	F	8030-00- 065-1970	SEALER,SPLITLINE MIL V-T-291, CLASS 1 (19207) 8355861	QT
17	F		THREAD, LINEN SPEC V-T-29, TYPE A, CLASS 1 (19207) 8355862	FT
18	F		GREASE, HEAVY DUTY (73342) 6768249	QT
19	F		BLOCK, WOOD (19207)	FT
20	F		SOLVENT, CLEANING (19207)P-D-680	QT
21	F		RAG, CLEANING (19207)	YD
22	F		DEHYDRATING AGENT MIL-D-3464, CLASS 1	LB

(1)	(2)	(3)	(4)	(5)
Item Number	Level	National Stock Number	Description	U/M
23	F		DENATURED ACOHOL MIL-STD-1201	QT
24	F		TRICHLOROETHYLENE O-T-634	QT
25	F		TRISODIUM PHOSPHATE O-S-642	LB
26			RUST INHIBITOR HOUGHTON 238G	LB
27	F		RUST AND PAINT REMOVER MIL-C-14460, TYPE 1	QT
28	F		VARNISH REMOVER MIL-C-25107	QT
29	F		CORROSION PREVENTION COMPOUND MIL-C-11796, CLASS 2	QT
30	F		SEALER, NONHARDENING MIL-S-45180	QT
31	F		PAINT PIGMENT, YELLOW IRON OXIDE, HYDRATED SYNTHETIC, DRY MIL-TT-Y216B	QT

ALPHABETICAL INDEX

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V

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-37, Direct and General Support Maintenance requirements for tanks, Combat Engineer, Full Track, M728; Tank, Bridge Launcher, AVLB; Tank, Combat, Full Tracked: 105MM Gun, M60A1 (Rise); Tank, Combat, Full Tracked: 105MM Gun, M48A5; and M60A3 Tank Turret.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

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FROM: (YOUR UNIT'S COMPLETE ADDRESS)

Co. B 1st Tracked Vehicle BN
3rd MARDIV FMF
C/O FPO San Francisco, CA 96602

DATE 07 May 1982

PUBLICATION NUMBER	DATE	TITLE
TM 9-2520-223-34 & P	3-31-82	DS & GS, Maintenance Manual for CD 850-6A Transmission

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.
3-66			

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In step 4, gear is (D) and hub is (G). Figure callouts are reversed. Correct the figure.

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

Mechanic, J. Pfc 378-4187

SIGNATURE

J. Mechanic, PFC

DA FORM 1 AUG 74 2028-2

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TEAR ALONG DOTTED LINE

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TEAR OUT ALONG PERFORATIONS

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DEPARTMENT OF THE ARMY
DOD 314

COMMANDER
US ARMY TANK–AUTOMOTIVE MATERIEL READINESS COMMAND
WARREN, MICHIGAN 48090
ATTN: DRSTA-MBC

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ATTN: DRSTA-MBC

FOLD

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

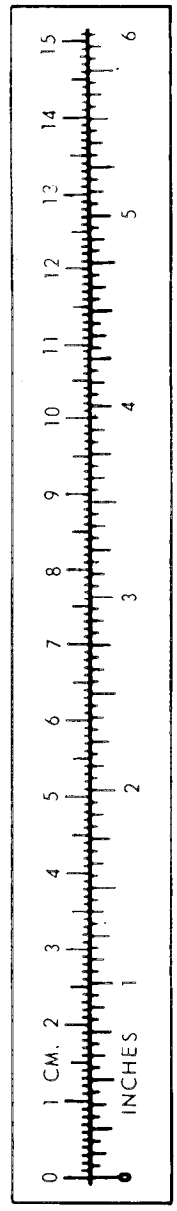
TEMPERATURE

$\frac{5}{9}(°F - 32) = °C$
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
$\frac{9}{5}°C + 32 = °F$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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