

# **LEACH<sup>®</sup>**

## **2R II Packmaster Service Manual Serial Numbers 0001-6972**



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Part No. 105601

# TO ORDER PARTS

Contact your local LEACH Signature Original Factory parts distributor

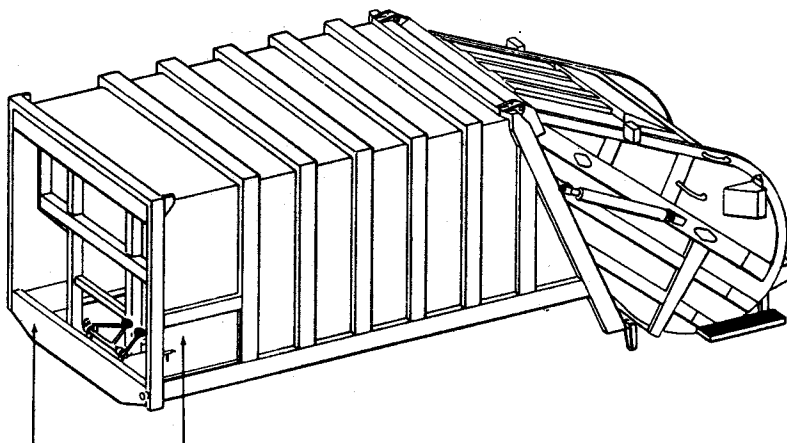
\_\_\_\_\_  
Your Authorized Leach Distributor

provide the following information:

- A Company name
- B Date
- C Your order number
- D Routing instructions
- E Quantity, part number and description
- \*F Model and serial number of unit

Accept only LEACH Signature Original Factory Parts.

**2RII**



**\*SERIAL NUMBER LOCATION**

# WARRANTY



Refuse bodies manufactured by Leach Company, ("Company") are supplied and sold under a Limited Warranty that they are and will remain free of defects in workmanship or material for a period of six (6) months from date of original sale under reasonable conditions of use and operation, providing required preventative maintenance services are performed. An additional six (6) month warranty is also available for purchase. If a failure occurs during said period because of such defect in the opinion of the Company, the component or part shall be repaired or replaced by an authorized Leach Distributor at no cost to the customer provided the unit is brought to the distributor's service facility. After 3 months, performance of adjustments or the replacement of wear/expendable components is not covered under warranty. This limited warranty is the sole and exclusive warranty of the Leach Company.

THE COMPANY MAKES NO WARRANTY AS TO MERCHANTABILITY, FITNESS FOR USE, LEGALITY OF OPERATION IN ANY JURISDICTION OR ANY IMPLIED WARRANTY OF ANY KIND OR NATURE. THE COMPANY SHALL NOT BE LIABLE FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR NATURE, OTHER THAN ITS LIMITED WARRANTY OF REPLACEMENT HEREIN. NO OTHER PERSON, FIRM OR CORPORATION CAN BIND THE COMPANY TO ANY WARRANTY OTHER THAN HEREIN ABOVE STATED.

To validate the new unit warranty, an authorized Leach distributor must have completed a pre-delivery inspection before the unit is placed into service, and the delivery report form signed by both the customer and distributor must be submitted to the Leach Service Department.

Because Company products are engineered to work only with genuine Company parts, this limited warranty will be void and of no effect if: (a) Company products are modified other than as done at its factory or as authorized to be done by the factory in writing; or (b) Parts or assemblies of any other manufacturer are used as substitutes for genuine Company parts.

Genuine Leach replacement parts, components and assemblies are also sold under a Limited Warranty to be free from defects in workmanship or material for a period of six (6) months. This a replacement only warranty and the item must be returned to the Leach distributor for exchange. The labor to replace or repair the part shall be the responsibility of the customer. There is no warranty on expendable items, wear components or used parts.

Leach Company reserves the right to redesign and/or discontinue the manufacture of parts, components and assemblies at any time.

# FOREWORD

---

For over 100 years the Leach Company has been an industry leader. The Leach 2Rll Packmaster is a quality built product of the most advanced design. We at Leach are proud of the quality engineering, material, and workmanship that goes into each unit which is backed up by the best parts, service, and distributor support in the industry.

An area of great importance to us at Leach Company is your safety. Please read carefully the SAFETY PRECAUTIONS in Section 2. They are important.

This manual was prepared with the intention of providing clear, concise, easy-to-use operating, service and installation instructions. We ask that if you have any comments or suggestions about this manual, please contact us. We are here to be of service to you, our valued customers.

Best regards,

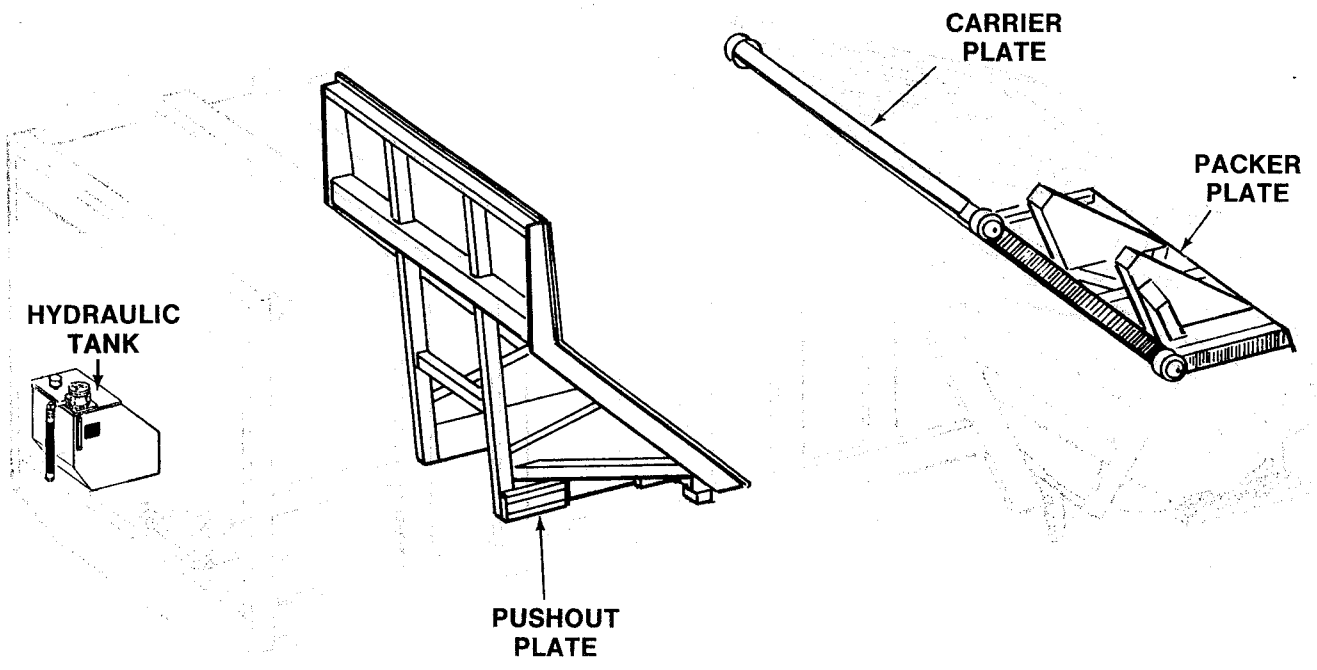
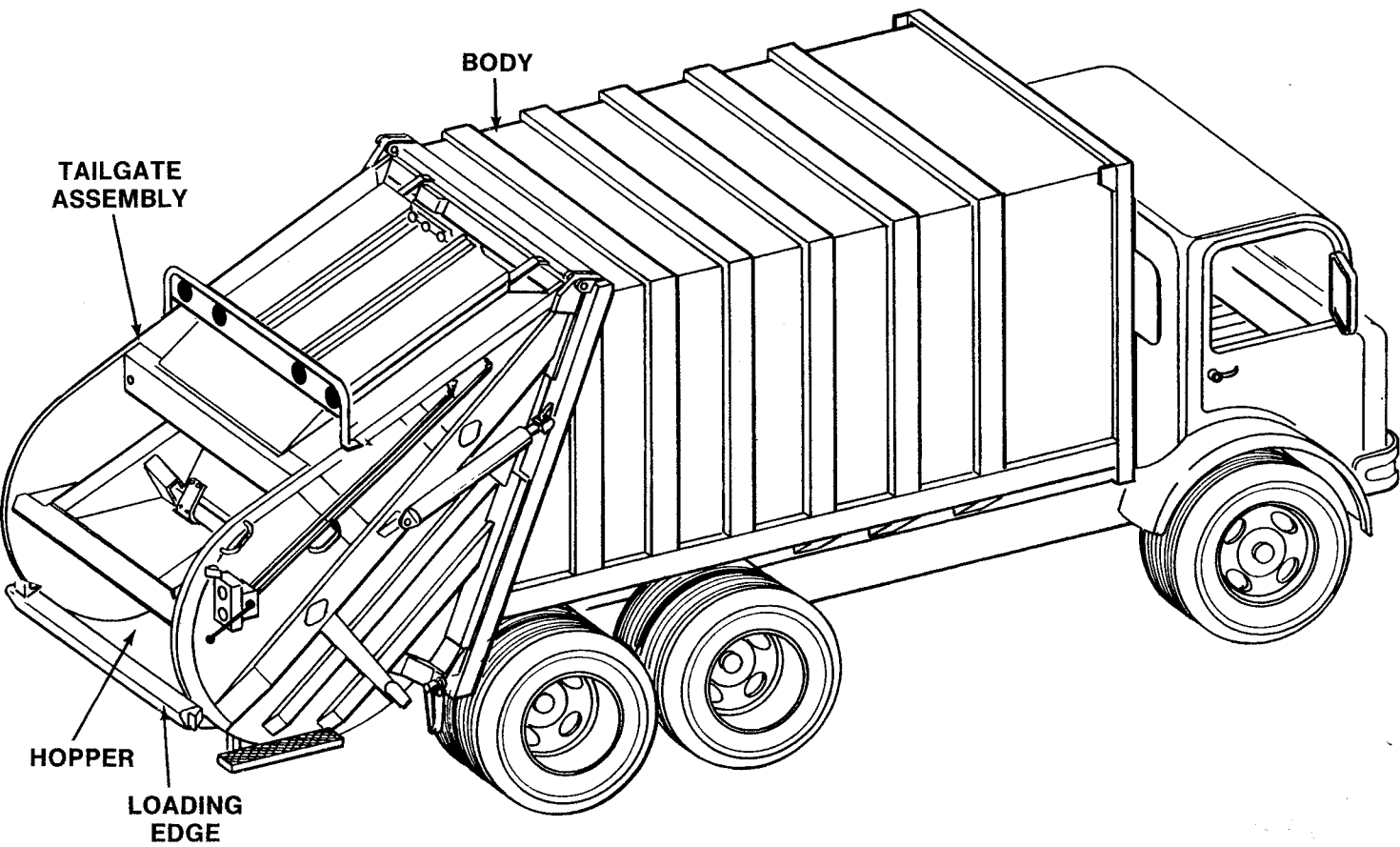
Danny J. Schloss, C.S.E.  
Director of Service

# TABLE OF CONTENTS

SEC.	TOPIC	PAGE	SEC.	TOPIC	PAGE
	ORDERING PARTS .....	I			
	WARRANTY .....	II			
	FOREWORD .....	III			
	TABLE OF CONTENTS .....	IV			
<b>1</b>	<b>INTRODUCTION</b>		<b>6</b>	<b>PREVENTIVE MAINTENANCE</b>	
	• Terms You Will Need To Know ....	1-1		• General .....	6-1
	• Introduction .....	1-2		• Operating and Maintenance Records .....	6-1
	• Loading .....	1-2		• Preventive Maintenance Requirements .....	6-1
	• Compaction .....	1-2		• Daily .....	6-1
	• Unloading .....	1-3		• Lubrication Chart (Illus.) .....	6-2
<b>2</b>	<b>SAFETY PRECAUTIONS</b>			• Hydraulic System Service (Illus.) ...	6-4
	• General .....	2-1		• Hydraulic System Service .....	6-5
	• Danger, Warning and Caution Decals .....	2-1		• Hydraulic System Service .....	6-6
	• Prior to Start Up .....	2-1		• Contamination .....	6-6
	• Decal Locations (Illus.) .....	2-2		• Commercial Hydraulic Fluid Testing .....	6-6
	• Decals (Illus.) .....	2-3		• In House Hydraulic Fluid Testing .....	6-6
	• Operation .....	2-5		• Weekly Preventive Maintenance ....	6-7
	• Fire Protection .....	2-6		• Monthly Preventive Maintenance ...	6-7
	• Housekeeping .....	2-6		• Yearly Preventive Maintenance ....	6-7
	• Cleanliness .....	2-6	<b>7</b>	<b>CHECK-OUT</b>	
	• Shutdown .....	2-6		• General .....	7-1
<b>3</b>	<b>OPERATION</b>			• Hydraulic Tank Fluid Level .....	7-1
	• Operating Controls (Illus.) .....	3-1		• Engine Solenoid Switch .....	7-1
	• General .....	3-2		• Engine Speed-up Switches .....	7-2
	• Description of Operating Controls .....	3-2		• Packing Cycle Time .....	7-2
	• Operating Procedures .....	3-5		• Pressures .....	7-3
	• Pre-operation Walk-Around Inspection .....	3-5		• Main Line Pressure .....	7-3
	• Start Up (Operating Instructions) .....	3-8		• Reversing Pressure .....	7-4
	• Positioning Pushout Plate .....	3-9		• Knockout Pressure .....	7-4
	• Loading the Hopper .....	3-10		• Sequence Valve Pressure .....	7-5
	• Packing the Load .....	3-10		• Friction Brake .....	7-5
	• Unloading at Dumpsite .....	3-11		• Clamp Mechanism .....	7-6
	• Lifting the Tailgate .....	3-12		• Pushout Shoes and Wear Blocks ..	7-6
	• Ejecting the Load .....	3-12		• Power Take Off (PTO) .....	7-6
	• Lower the Tailgate .....	3-13	<b>8</b>	<b>TROUBLESHOOTING</b>	
	• Shutdown .....	3-13		• General .....	8-1
<b>4</b>	<b>GENERAL REPAIR PRACTICES</b>			• Compaction .....	8-1
	• Preparation for Service .....	4-1		• Dieseling In Hydraulic Systems ....	8-2
	• Replacement Parts .....	4-1		• Diagnostic Charts .....	8-3
	• Service Bulletins .....	4-1		• Description of Hydraulic System ...	8-9
	• Prior to Performing Any Service or Repair .....	4-2		• System Component Nomenclature .....	8-9
	• Safety During Service and Repair .....	4-2		• Hydraulic Flow Charts .....	8-10
	• Welding Precautions .....	4-2		• Main Operating Valve Description .....	8-19
	• Removal, Disassembly and Repair .....	4-3		• Terms You Will Need to Know ....	8-19
	• Reassembly and Installation .....	4-3		• First Half of Packing Cycle .....	8-20
	• Electrical Testing .....	4-3		• Second Half of Packing Cycle .....	8-22
	• Welding .....	4-4		• Troubleshooting the Main Operating Valve .....	8-25
	• Lifting Instructions .....	4-4		• Preliminary Checks and Adjustments .....	8-25
	• Capscrew Marking and Torque ....	4-5		• Troubleshooting .....	8-25
<b>5</b>	<b>SPECIFICATIONS</b>			• Diagnostic Charts .....	8-26
	• General Dimensions .....	5-1		• MOV Diagnostic Charts .....	8-26
	• Lubricants .....	5-2	<b>9</b>	<b>SERVICE AND REPAIR</b>	
	• Hydraulic System .....	5-2		• Main Component Location .....	9-1
	• Pump .....	5-2		• General .....	9-2
	• Leach Hydraulic Fluid Recommendation .....	5-2		• Operating Cylinders .....	9-2
	• Hydraulic Fluid .....	5-2		• Leaking Packer Plate Cylinders ....	9-3
				• Leaking Carrier Plate Cylinders ....	9-4
				• Removal of Packer Plate Cylinders .....	9-6

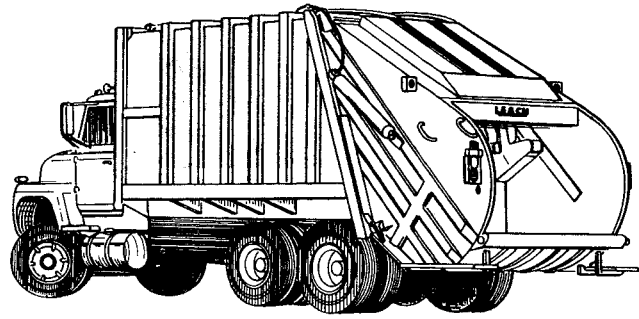
SEC.	TOPIC	PAGE	SEC.	TOPIC	PAGE
	• Removal of Carrier Plate Cylinders .....	9-8		• Disassembly and Removal of Clamp Mechanism .....	9-55
	• Disassembly of Operating Cylinders .....	9-10		• Inspection and Replacement of Clamp Mechanism .....	9-57
	• Inspection and Replacement of Operating Cylinders .....	9-10		• Reassembly and Installation of Clamp Mechanism .....	9-57
	• Reassembly and Installation of Operating Cylinders .....	9-11		• Clamp Adjustment .....	9-57
	• Packer Plate .....	9-11		• Clamp Cylinder .....	9-58
	• Bearing Replacement .....	9-11		• Test for Leaking Clamp Cylinder Piston Cup .....	9-58
	• Roller Replacement/Shimming .....	9-12		• Removal of Clamp Cylinder .....	9-58
	• Tailgate Lift Cylinders .....	9-14		• Disassembly of Clamp Cylinder .....	9-59
	• Leaking Tailgate Cylinder .....	9-14		• Inspection and Replacement of Clamp Cylinder .....	9-60
	• Removal of Tailgate Lift Cylinders .....	9-15		• Reassembly and Installation of Clamp Cylinder .....	9-60
	• Disassembly of Tailgate Cylinder .....	9-15		• Carrier and Packer Plates .....	9-60
	• Inspection and Replacement of Tailgate Cylinder .....	9-16		• Description of Theory of Operation .....	9-60
	• Reassembly and Installation of Tailgate Cylinder .....	9-16		• Removal of Packer Plate .....	9-61
	• Tailgate Assembly Description .....	9-16		• Inspection and Replacement of Packer Plate .....	9-62
	• Removal of Tailgate Assembly .....	9-17		• Replacement of Packer Edge .....	9-62
	• Inspection and Replacement of Tailgate .....	9-18		• Installation of Packer Plate .....	9-63
	• Single-Spool Directional Control Valves .....	9-18		• Removal of Carrier Plate .....	9-63
	• 2-Spool Control Valve .....	9-23		• Inspection and Replacement of Carrier Plate .....	9-64
	• Spool Ordering Procedure .....	9-26		• Installation of Carrier Plate .....	9-64
	• Description of Main Operating Valve .....	9-29		• Track Bar Replacement .....	9-64
	• Resealing the Main Operating Valve .....	9-29		• Description of Pushout Plate .....	9-65
	• Reversing Plunger .....	9-30		• Front Wear Block Replacement .....	9-65
	• Knockout Plunger .....	9-31		• Rear Wear Block Replacement .....	9-66
	• Main Spool .....	9-32		• Removal of Pushout Plate .....	9-66
	• Resealing the MOV .....	9-35		• Inspection and Replacement of Wear Blocks and Pushout Shoes .....	9-67
	• Removal of Reversing Spring .....	9-39		• Shimming Upper Wear Blocks .....	9-67
	• Removal of Knockout Spring .....	9-40		• Leach Hydraulic Pump .....	9-67
	• Oil Jet Replacement .....	9-41		• Removal of Hydraulic Pump .....	9-68
	• Check Valve Replacement .....	9-42		• New Pump Preparation .....	9-68
	• MOV Pressure Adjustments .....	9-42		• Disassembly of 203834 Hydraulic Pump .....	9-69
	• Knockout Plunger .....	9-43		• Replacing Hydraulic Pump Shaft Seals .....	9-69
	• Bridge Assembly Mechanical Inspection and Adjustment .....	9-44		• Reassembly of Hydraulic Pump .....	9-70
	• Reversing Mechanical Components .....	9-45		• Installation of Hydraulic Pump .....	9-71
	• Knockout Mechanical Components .....	9-46		• Testing a New Pump .....	9-71
	• Description and Removal of SPC Valve .....	9-47		• Electrical System .....	9-71
	• Test/Adjustment of 3000 lb. Relief Valve .....	9-49	10	<b>OPTIONAL TELESCOPIC PUSHOUT</b>	
	• Pushout Cylinder .....	9-50		• General .....	10-1
	• Test for Leaking Pushout Cylinder Piston Cups .....	9-50		• Operation .....	10-1
	• Removal of Pushout Cylinder .....	9-52		• Anti-back Packing Components .....	10-1
	• Disassembly of Pushout Cylinder .....	9-53		• Checkout Procedures .....	10-2
	• Inspection and Replacement of Pushout Cylinder .....	9-54		• Check Pushout Pressure .....	10-2
	• Reassembly and Installation of Pushout Cylinder .....	9-54		• Check Telescopic Cylinder Retraction (Manual) .....	10-3
	• Clamp Mechanism .....	9-55		• Check Telescopic Resistance Circuit .....	10-3
	• Wear Points .....	9-55		• Troubleshooting .....	10-5
				• Telescopic Cylinder .....	10-8
				• In Cab Electrical Components .....	10-9
			11	<b>SERVICE TOOLS</b> .....	11-1
				<b>MANUALS &amp; LITERATURE ORDER FORM</b>	
				<b>REWARD</b>	

**TERMS YOU WILL NEED TO KNOW**

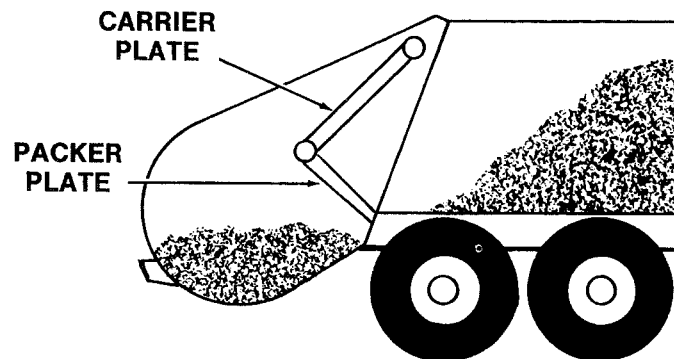


**INTRODUCTION****INTRODUCTION**

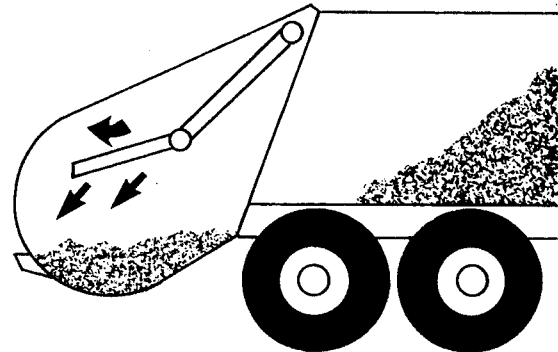
The main purpose of the 2Rll Packmaster is to safely and efficiently: load; compact; (transport); and unload refuse. The following describes how the unit performs those tasks in the most basic terms. For a more detailed description of the unit and its components, read the complete 2Rll PACKMASTER SERVICE MANUAL. Before going further, look at the accompanying full page illustration of the 2Rll Packmaster and become familiar with the terms you will need to know.

**LOADING**

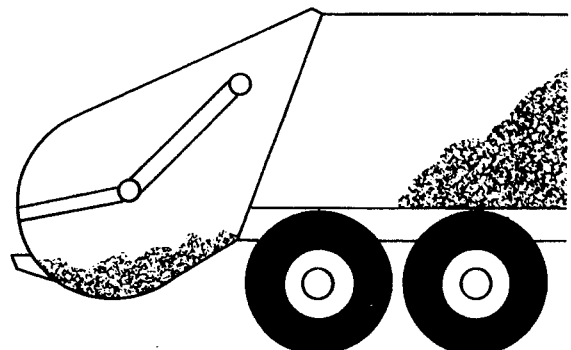
Refuse is first loaded into the hopper of the tailgate assembly. The carrier and packer plates, which sweep up and pack the refuse from the hopper, will be in the "home" position.

**"HOME" POSITION****COMPACTION**

When the operator starts the packing cycle the carrier and packer plates move rearward, over the load.

**CARRIER & PACKER PLATES MOVE OVER LOAD**

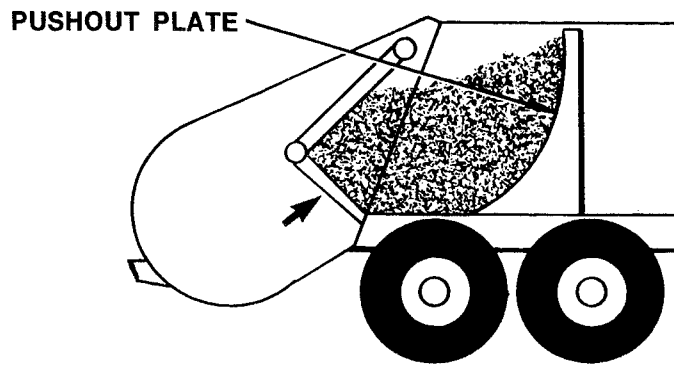
Next, the carrier and packer plate automatically stop at the "interrupted cycle" position.

**"INTERRUPTED CYCLE"**



## INTRODUCTION

The operator again activates the packing cycle. The carrier and packer plates move forward and sweep the refuse from the hopper up into the body and pack it against the pushout plate. Having completed a cycle, the carrier and packer plates are back into the "home" position and the hopper is cleared for more refuse.

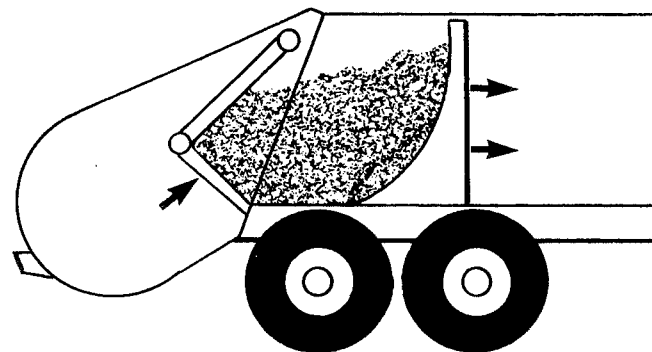


## COMPACTION CYCLE

Also, during the compaction cycle, considerable hydraulic pressure is applied to the cylinders which control movement of the carrier and packer plates. This causes the refuse to be compacted tightly allowing for a large carrying capacity.

On units with the standard clamp pushout system, the operator must manually release the pushout plate clamping system to allow movement of the pushout plate.

Once the body is full the 2Rll Packmaster can be moved to the dumpsite for unloading.

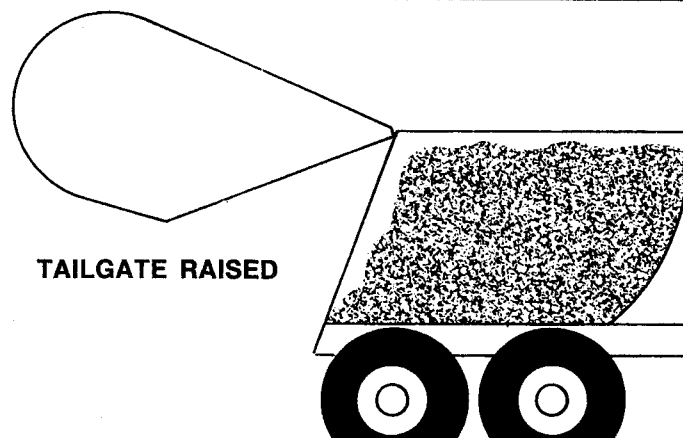


## PUSHOUT PLATE MOVES FORWARD

## UNLOADING

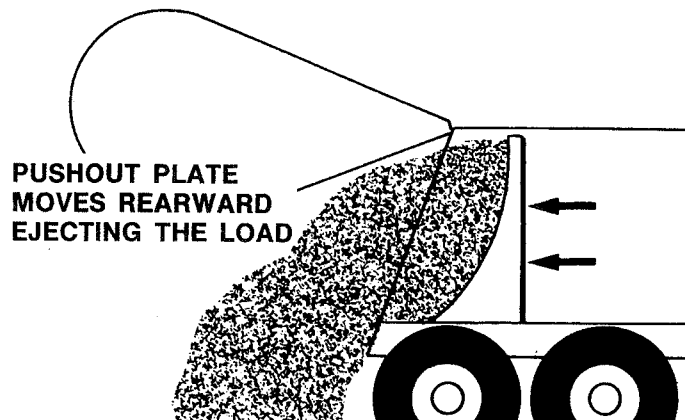
At the dumpsite the unit is unloaded in two easy steps:

First, the tailgate is raised by the operator.



Second, the pushout plate is moved to the rear of the body, pushing out the load.

The pushout cylinder is retracted and then the clamp set by extending the cylinder a couple of inches. At this time the pushout plate is again in position for loading. The tailgate is lowered and "latched" to the body.



## SECTION 1

### INTRODUCTION

---

## SAFETY PRECAUTIONS

## GENERAL

The 2Rll Packmaster has been designed with the operator in mind. However, as with any industrial machinery, especially those that are large and apply forces through hydraulic pressures, the ultimate responsibility for safety rests with you — the user. An alert, conscientious attitude and observance of all known safe operating practices are the best ways to prevent accidents.

Before operating the unit it is the operator's responsibility to be thoroughly familiar with the instructions contained in the Operator's Manual.

Publication of these precautions does not imply or in any way represent an all inclusive list. It is the operator's responsibility to be familiar with and ensure that operation is in accordance with safety requirements and codes including all applicable Occupational Safety & Health Act (OSHA) and American National Standards Institute (ANSI) regulations.

## DANGER, WARNING, AND CAUTION DECALS

See the accompanying illustration for the location and label content of all safety decals.

1. These decals must be obeyed at all times.
2. These decals must be in place at all times. Report any damaged or missing decals to the proper authority at once.
3. Replacement decals can be ordered free of charge from your local authorized LEACH distributor.



**DANGER, WARNING, CAUTION** and **NOTE** notations appear throughout this manual.

\* The word **DANGER** precedes information pertaining to specific immediate hazards which if disregarded, **WILL** result in **SEVERE PERSONAL** injury or death of the user or others.

\* The word **WARNING** precedes information pertaining to hazards or unsafe practices which **COULD** result in personal injury or death.

\* The word **CAUTION** precedes information pertaining to potential hazards or unsafe practices which if disregarded, may result in minor personal injury or damage to the equipment.

\* The word **NOTE** precedes information which is vital to the proper operation or maintenance of the equipment.



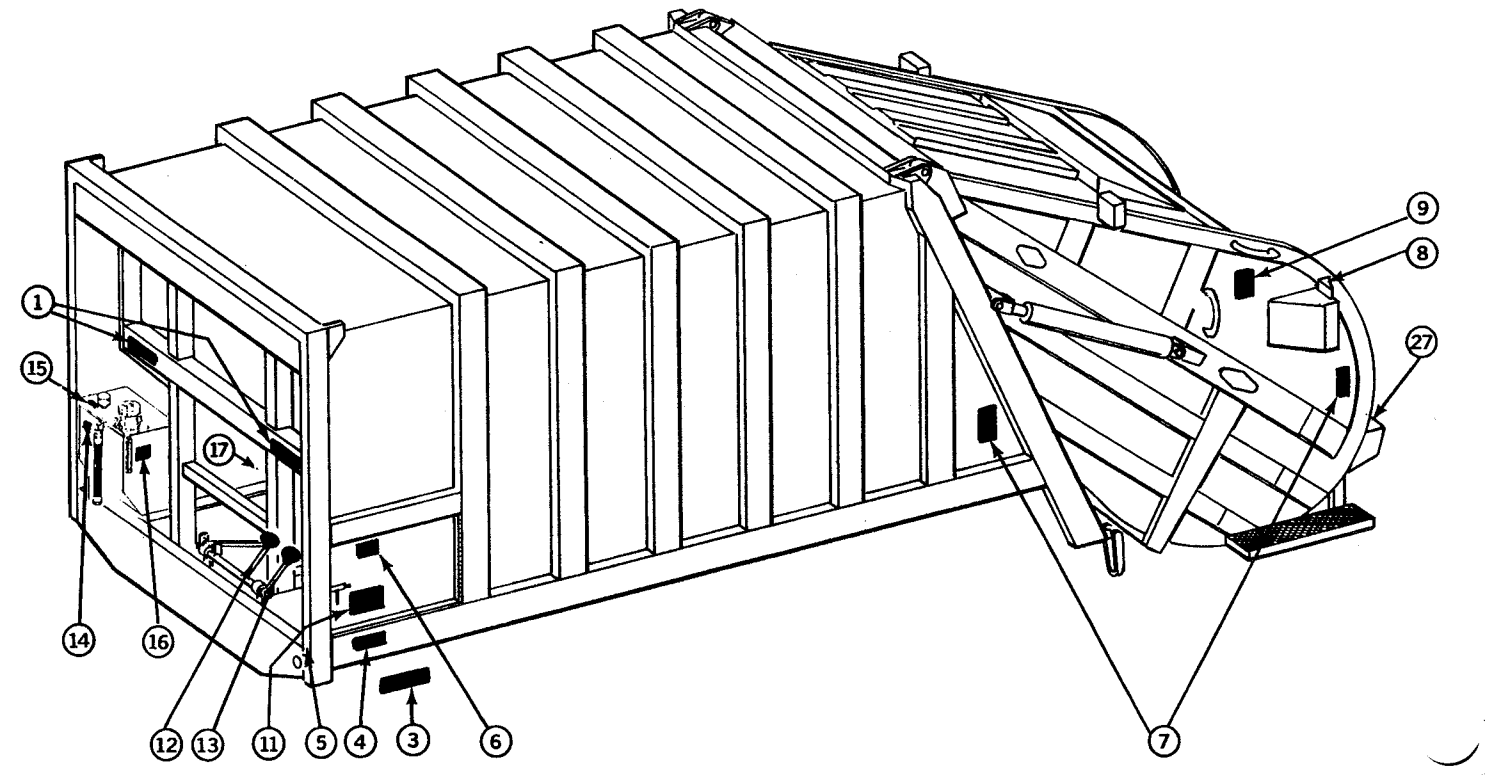
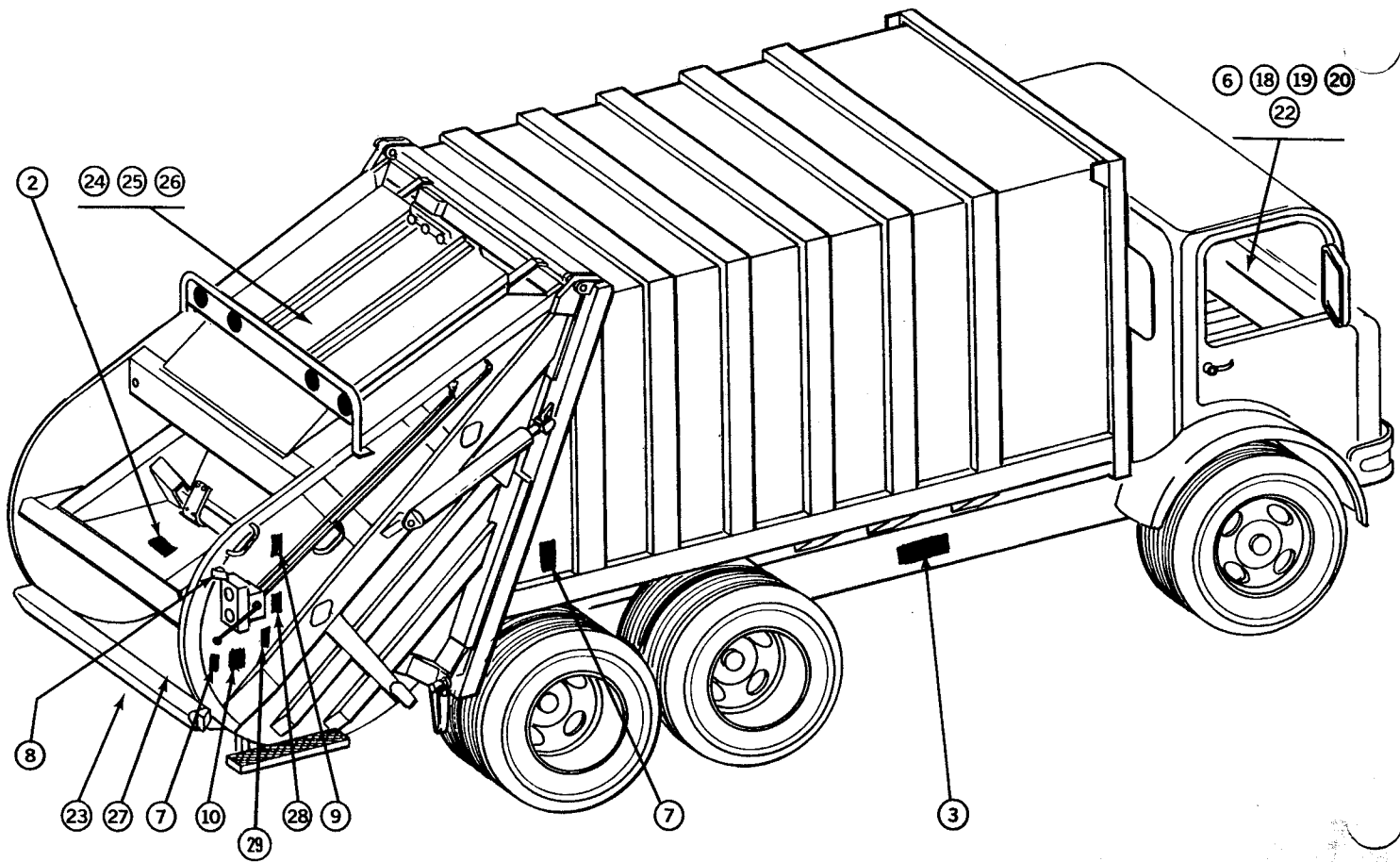
## PRIOR TO START UP

1. Never operate machinery while wearing jewelry or loose clothing which may catch on moving parts. Wear proper safety equipment as specified by your employer.
2. Never operate machinery while under the influence of intoxicants or narcotics. Workers under the influence of intoxicants or narcotics present a hazard to themselves and others.
3. Perform checks listed under Pre-operation "Walk-around" inspection in Section 3, OPERATION. Never start or operate any malfunctioning equipment.
4. Operators will not attempt to perform any service procedures on the equipment. Proper servicing requires specialized tools and procedures. Service must be performed by authorized personnel only, following procedures in the 2Rll Service Manual.
5. Walk completely around the vehicle to make sure all persons are clear before starting the unit.



# SECTION 2

## SAFETY PRECAUTIONS



# DANGER — DO NOT ENTER UNLESS BODY IS EMPTY & IGNITION OFF & KEY REMOVED

①

**▲ DANGER**



STAND CLEAR WHEN BLADE IS IN MOTION

②

**DANGER**

DO NOT ENTER UNDER CHASSIS UNLESS ENGINE OR POWER UNITS ARE STOPPED AND IGNITION KEYS REMOVED

③

**CAUTION** DO NOT OPEN DOOR UNLESS ALL PRESSURE AGAINST THE PUSH-OUT PLATE HAS BEEN RELEASED & THE HYDRAULIC PUMP STOPPED.

④

**ENGINE SPEED-UP** ⑤

**WARNING**

THIS VEHICLE REQUIRES CLEARANCE AS ORIGINALLY MOUNTED.

⑥

10FT 6 IN.	11FT 1 IN.	11FT 8 IN.	12FT 3 IN.
10FT 7 IN.	11FT 2 IN.	11FT 9 IN.	12FT 4 IN.
10FT 8 IN.	11FT 3 IN.	11FT 10 IN.	12FT 5 IN.
10FT 9 IN.	11FT 4 IN.	11FT 11 IN.	12FT 6 IN.
10FT 10 IN.	11FT 5 IN.	12FT 0 IN.	12FT 7 IN.
10FT 11 IN.	11FT 6 IN.	12FT 1 IN.	12FT 8 IN.
11FT 0 IN.	11FT 7 IN.	12FT 2 IN.	12FT 9 IN.

**▲ DANGER**



STAND CLEAR WHEN TAILGATE IS IN MOTION & DURING UNLOADING CYCLE. DO NOT STAND UNDER OR CROSS UNDER RAISED TAILGATE

⑦

DRIVER SIGNAL

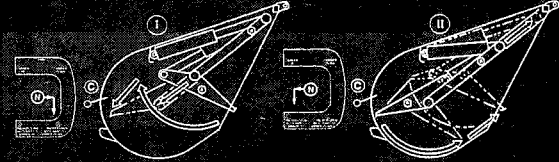
⑧

**CAUTION**

RIDING STEP SHALL NOT BE USED WHEN SPEEDS ARE EXPECTED TO EXCEED 10 MPH OR WHEN DISTANCE TRAVELED WITHOUT STOPPING WILL EXCEED 2 TENTHS OF ONE MILE. RIDING STEP SHALL NOT BE USED WHEN VEHICLE IS MOVING BACKWARD. DO NOT MOUNT OR DISMOUNT RIDING STEP WHEN VEHICLE IS IN MOTION.

⑨

2RII OPERATING INSTRUCTIONS 206073



**NOTE: WHEN LOADING HOPPER DO NOT LOAD REFUSE HIGHER THAN LOADING EDGE**

**ILLUSTRATION ACTION REACTION**

1 START THE PACKING CYCLE BY MOVING PACKER LEVER (C) OUT AND DOWN TO POSITION 1. PACKER PLATE (A) WILL OPEN THEN PACKER PLATE (A) AND CARRIER PLATE (B) WILL MOVE TOGETHER TO THE "INTERRUPTED CYCLE POSITION" WITH THE PACKING LEVER SHIFTING TO NEUTRAL (D).

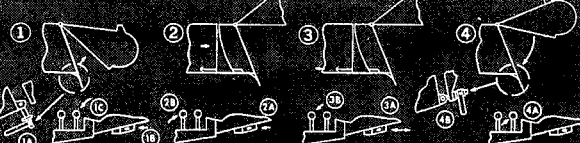
2 TO FINISH THE CYCLE MOVE THE PACKING LEVER (C) IN AND DOWN TO POSITION 2. PACKER PLATE (A) WILL SWEEP THE HOPPER, THEN PACKER PLATE (A) AND CARRIER PLATE (B) WILL MOVE TOGETHER TO THE "HOME POSITION" WITH THE PACKING LEVER SHIFTING TO NEUTRAL (D).

**NOTE 1:** WHEN EJECTOR PANEL IS FULLY RETRACTED FORWARD AND PACKER MECHANISM WILL NO LONGER MOVE TO "HOME POSITION" BODY IS FULL AND NO MORE ATTEMPTS SHOULD BE MADE TO PACK UNTIL BODY IS EMPTY.

**NOTE 2:** MOVEMENT OF PACKER AND CARRIER MAY BE CHANGED AT ANY POINT IN THE CYCLE BY MOVING THE PACKER LEVER TO THE DIRECTION OF TRAVEL DESIRED.

PACKING CYCLE MAY BE STOPPED AT ANY POINT BY MOVING PACKING LEVER TO NEUTRAL.

⑩



**UNLOADING INSTRUCTIONS**

ENGAGE PUMP TAKE OFF TO RUN PUMP. PLACE DASH MOUNTED SOLENOID IN "ON" POSITION. BE SURE AREA BEHIND UNIT IS CLEAR OF ALL PERSONNEL AND OBJECTS.

**TO OPEN TAILGATE** SEE FIGURE 1

① LOOSEN CLAMPS ON EACH SIDE OF TAILGATE AND SWING CLEAR. ② PRESS SPEED UP BUTTON AND HOLD. ③ MOVE OUTER CONTROL LEVER FORWARD AND HOLD. WHEN TAILGATE IS FULLY OPEN RELEASE CONTROL LEVER AND SPEED UP BUTTON. DO NOT ALLOW ANYONE TO STAND OR CROSS UNDER THE OPEN TAILGATE.

**TO UNLOAD BODY** SEE FIGURES 2 & 3

④ PRESS SPEED UP BUTTON AND HOLD. ⑤ MOVE INNER CONTROL LEVER REARWARD. HOLD UNTIL REARWARD TRAVEL OF PUSHOUT PLATE (A) IS COMPLETE. ⑥ RELEASE SPEED UP BUTTON. ⑦ MOVE INNER CONTROL LEVER FORWARD. PRESS SPEED UP BUTTON. HOLD UNTIL PUSHOUT BAR IS FULLY RETRACTED. REPEAT ④ AND ⑤ UNTIL BODY IS EMPTY. RETRACT PUSHOUT BAR (A) AFTER BODY IS EMPTY.

**TO CLOSE TAILGATE** SEE FIGURE 4

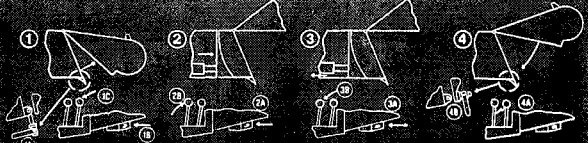
⑧ SHUT OFF POWER TAKE OFF. MOVE UNIT FORWARD SLOWLY UNTIL TAILGATE IS CLEAR OF THE EXPELLED LOAD. BE SURE AREA UNDER AND AROUND TAILGATE IS CLEAR OF ALL PERSONNEL OR OBJECTS BEFORE CLOSING. MOVE OUTER LEVER (B) GENTLY REARWARD TO ALLOW TAILGATE TO CLOSE. DO NOT ALLOW TAILGATE TO SLAM SHUT. SWING BOTH TAILGATE CLAMPS BACK TO LATCH POSITION (C) AND TIGHTEN EVENLY AND SECURELY.

**CAUTION**

TAILGATE MUST BE FULLY OPEN BEFORE EXPELLING LOAD. DO NOT MOVE UNIT WITH TAILGATE RAISED MORE THAN NECESSARY. DO NOT TRAVEL WITH TAILGATE CLAMPS UNLATCHED OR LOOSE. NEVER LEAVE UNIT UNATTENDED WHEN TAILGATE IS OPEN. ALWAYS SET BRAKE WHEN LEAVING THE CAB.

CLAMP EJECTION

⑪



**UNLOADING INSTRUCTIONS**

ENGAGE PUMP PLACE DASH MOUNTED SOLENOID IN "ON" POSITION. BE SURE AREA BEHIND UNIT IS CLEAR OF ALL PERSONNEL AND OBJECTS.

**TO OPEN TAILGATE** SEE FIGURE 1

① LOOSEN CLAMPS ON EACH SIDE OF TAILGATE AND SWING CLEAR. ② PRESS SPEED UP BUTTON AND HOLD. ③ MOVE OUTER CONTROL LEVER FORWARD AND HOLD. WHEN TAILGATE IS FULLY OPEN RELEASE CONTROL LEVER AND SPEED UP BUTTON. DO NOT ALLOW ANYONE TO STAND OR CROSS UNDER THE OPEN TAILGATE.

**TO UNLOAD BODY** SEE FIGURES 2 & 3

④ PRESS SPEED UP BUTTON AND HOLD. ⑤ MOVE INNER CONTROL LEVER REARWARD. HOLD UNTIL REARWARD TRAVEL OF EJECTOR PANEL STOPS. ⑥ RELEASE SPEED UP BUTTON. ⑦ MOVE INNER CONTROL LEVER FORWARD. PRESS SPEED UP BUTTON. HOLD UNTIL EJECTOR PANEL IS FULLY RETRACTED. REPEAT ④ & ⑤ AFTER ARRIVAL AT WORK SITE, AND BEFORE LOADING IS STARTED.

**TO CLOSE TAILGATE** SEE FIGURE 4

⑧ DISENGAGE PUMP. MOVE UNIT FORWARD SLOWLY UNTIL TAILGATE IS CLEAR OF THE EXPELLED LOAD. BE SURE AREA UNDER AND AROUND TAILGATE IS CLEAR OF ALL PERSONNEL OR OBJECTS BEFORE CLOSING. MOVE OUTER LEVER (B) GENTLY REARWARD TO ALLOW TAILGATE TO CLOSE. DO NOT ALLOW TAILGATE TO SLAM SHUT. SWING BOTH TAILGATE CLAMPS BACK TO LATCH POSITION (C) AND TIGHTEN EVENLY AND SECURELY.

**CAUTION**

TAILGATE MUST BE FULLY OPEN BEFORE EXPELLING LOAD. DO NOT MOVE UNIT WITH TAILGATE RAISED MORE THAN NECESSARY. DO NOT TRAVEL WITH TAILGATE CLAMPS UNLATCHED OR LOOSE. NEVER LEAVE UNIT UNATTENDED WHEN TAILGATE IS OPEN. ALWAYS SET BRAKE WHEN LEAVING THE CAB.

TELESCOPIC EJECTION

EJECTION

⑫

TAILGATE

⑬



**SAFETY PRECAUTIONS**

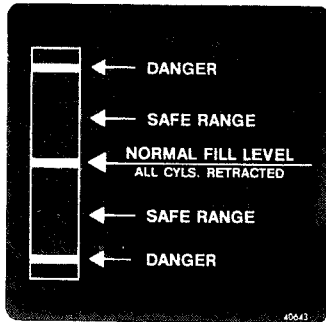
**FILTER ELEMENT CHANGE**

TO ENSURE OIL CLEANLINESS AND LONGER MACHINE LIFE, CHANGE THE ELEMENT AT INTERVALS OF 20 HRS., 50 HRS., AND AT 250 HR. INTERVALS THEREAFTER.

14

**HYDRAULIC FLUID ONLY**

15



16

**CAUTION**

CYLINDER IS UNDER SPRING COMPRESSION. CARE SHOULD BE USED WHEN DISASSEMBLING BY LOOSENING NUTS EQUALLY, AND THEREFORE RELIEVING SPRING TENSION SAFELY.

17

**SOLENOID MUST BE OFF WHEN TRUCK IS PARKED.**  
OFF ON

18

**CAUTION TAILGATE OPEN**

19

**CAUTION**

DO NOT OPERATE VEHICLE AT SPEED IN EXCESS OF 10 MPH OR FOR DISTANCES OVER 2 TENTHS MILE OR IN REVERSE GEAR WHEN RIDER OR RIDERS ARE ON RIDING STEPS.

20

LOCATE NEAR P.T.O. CONTROL

PLACE THIS LABEL ON SUN VISOR 370003

**POWER TAKE-OFF OPERATION**

**MECHANICAL TRANSMISSION**  
1. A power take-off is used and should be operated as an integral part of the main transmission.  
2. Before shifting the power take off into out of gear, disengage the clutch and wait for transmission or P.T.O. gears to stop rotating.

**TO OPERATE POWER TAKE-OFF PROPERLY WITH CONVERTER DRIVEN GEAR**  
1. Shift transmission into any of the drive positions (F, R, or N) and transmission gears from turning.  
2. Shift power take-off into gear.  
3. Shift transmission into neutral (F/R) and start transmission gears turning.

**WITH ENGINE DRIVEN GEAR**  
1. Shift P.T.O. into gear before starting engine.  
2. This procedure should eliminate gear clash.

**AUTOMATIC TRANSMISSION**  
POWER SHIF P.T.O.'s  
Change P.T.O. with engine at idle speed.

**CAUTION**  
This vehicle is equipped with a POWER TAKE-OFF. Read the operator's manual and the P.T.O. manual before operating. See the P.T.O. manual for complete instructions before using.

1242

1243

CHRYSLER

22

**DANGER**  
**STAND CLEAR AT ALL TIMES**

23

**LINE PULL**

24

**8,000 LB. CAPACITY**

25

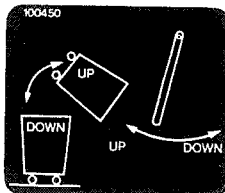
**12,000 LB. CAPACITY**

26

**CAUTION**

CONTAINER LATCH ARMS MUST BE ENGAGED & LOCKED ON CONTAINER AT ALL TIMES DURING RAISING & LOWERING OF CONTAINER

27



28

**▲ DANGER**

**STAND CLEAR WHEN TIPPER IS IN MOTION**

29

**NO STEP**

30

## SAFETY PRECAUTIONS

**OPERATION**

1. It is the operator's responsibility to ensure that operation of the unit is in accordance with the guidelines contained in this manual and in accordance with all applicable codes including OSHA and ANSI regulations.
2. Do not attempt to operate this equipment without proper training.

**—WHEN VEHICLE IS MOVING:**

3. Ride only in the cab or on riding platforms designed for that purpose. Riding platforms shall not be used when traveling distances greater than 2/10th of a mile without stopping, or at speeds greater than 10 mph.
4. Never allow anyone to ride on the loading sill or in the hopper.
5. Never allow anyone to ride on the steps when the vehicle is backing up.
6. Move vehicle as slowly as possible without stalling when traveling in reverse.
7. Always make sure the roadway is clear before traveling in reverse.
8. Do not travel in reverse for distances greater than those dictated by local ordinances. If reverse travel exceeds 10 feet, use a "spotter" or move vehicle in 10 foot increments only, and then check to make sure the roadway is clear between increments.
9. Stop the vehicle immediately if the warning light for the "TAILGATE AJAR" systems comes on.
10. Never use controls or hoses for hand holds when mounting or dismounting. Controls and hoses are movable. They do not provide proper support and may cause accidental equipment movement.

**— OPERATING FUNCTIONS:**

11. All service opening covers and access doors must be maintained and latched in place while operating the equipment.
12. Always ensure that all persons are clear of the equipment before actuating any packing or push-out controls.
13. Always ensure that all persons are clear before raising or lowering the tailgate. It is the operator's responsibility to warn all persons not to stand or cross under a raised tailgate.
14. Do not move the vehicle with the tailgate raised except during unloading and then only as necessary to clear the load before lowering.
15. Stand clear when the tailgate is being raised or lowered and during the unloading cycle. If necessary to manually clean debris from the hopper, use a long probe. DO NOT stand under the tailgate.
16. Do not attempt to dislodge any material above waist level unless wearing eye protection such as "approved" side shielded safety glasses or a full face shield.
17. Never use the vehicle to push or tow another vehicle.

18. Never unload uphill or against a pile of refuse or into the bank of a hill.
19. With the optional telescopic ejection the pushout cylinder remains fully extended. If the unit is going to travel over one mile empty, completely retract the cylinder. When packing is about to resume extend the cylinder and start packing.
20. After unloading, with the standard clamp system, always retract the pushout cylinder one stroke before loading.
21. Never enter the body unless the pushout plate clamp is released, PTO disengaged, and ignition key removed and placed in your pocket.
22. Never place head, body, fingers or any limbs into a scissors or pinch point on the equipment.
23. Never load hopper above the loading sill.
24. Never allow refuse to extend outside of the hopper when packing.
25. Allow the packing lever to shift automatically except during final packing of the last load and then override the lever only until the packing plate stops, as described in OPERATION, Section 3, of this manual.
26. To avoid possible bodily injury or tailgate damage, lower the tailgate slowly by moving the lever slowly and in increments.
27. Know the height of the unit before going under any underpass. Be sure to allow for sufficient clearance.
28. Do not attempt to load refuse into the hopper after the packing cycle has begun. The packer plate must be in the "home" position and stopped before loading the hopper.
29. Before operating the vehicle the operator must be thoroughly familiar with the employer's safety program concerning traffic rules, warning devices, and hand signals.
30. Be sure to know where to get assistance in the event of an emergency.
31. Know your unit. Know the location and function of all controls, gauges, instruments and protective devices.
32. Wear your seat belt.
33. Start the engine following the manufacturer's recommended procedure.
34. The dashboard solenoid switch must be "OFF" between pickups or when parked. This prevents inadvertent engine speed-up or battery drain if the tailgate lever is shifted.
35. The tailgate clamps must be tightened securely before starting to load.
36. Always set the parking brake when stopped.
37. Do not step on the throttle pedal while the speed up system is engaged.
38. Vehicles with automatic transmissions require the shift lever to be in drive to engage the PTO and in neutral to activate the PTO and speed up.



**SAFETY PRECAUTIONS**

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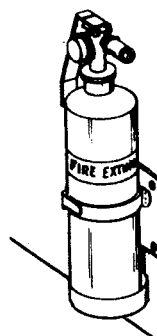
**HYDRAULICS:**

1. Hydraulic fluid operates under high temperatures. Avoid contact with piping, hoses or cylinders to prevent burns.
2. Never use hands to check for leaks. Hydraulic fluid escaping under pressure may cause injury.
3. In case of injury seek proper medical treatment immediately.

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**FIRE PROTECTION**

1. Keep a fire extinguisher accessible at all times, as recommended by the Bureau of Motor Carrier Safety.
2. Never use lighted smoking materials, open flame or sparks when working with flammable materials such as fuel tanks or storage batteries.
3. Never use an open flame as a light source.
4. Never load ashes or other materials which might be smoldering. These materials could ignite refuse in the packer body.



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**HOUSEKEEPING**

Good housekeeping habits are a major factor in accident prevention.

1. Keep handrails and steps clean and free of grease or debris.
2. Do not store brooms or other equipment where they could inadvertently activate the packer controls.

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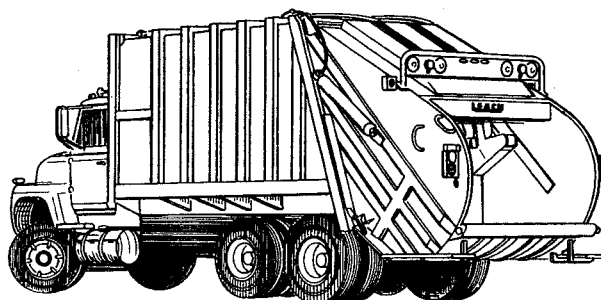
**CLEANLINESS**

1. Rubbish, scrap paper, and litter are highly combustible. Such material should be stored in metal containers entirely clear of sparks and flame.

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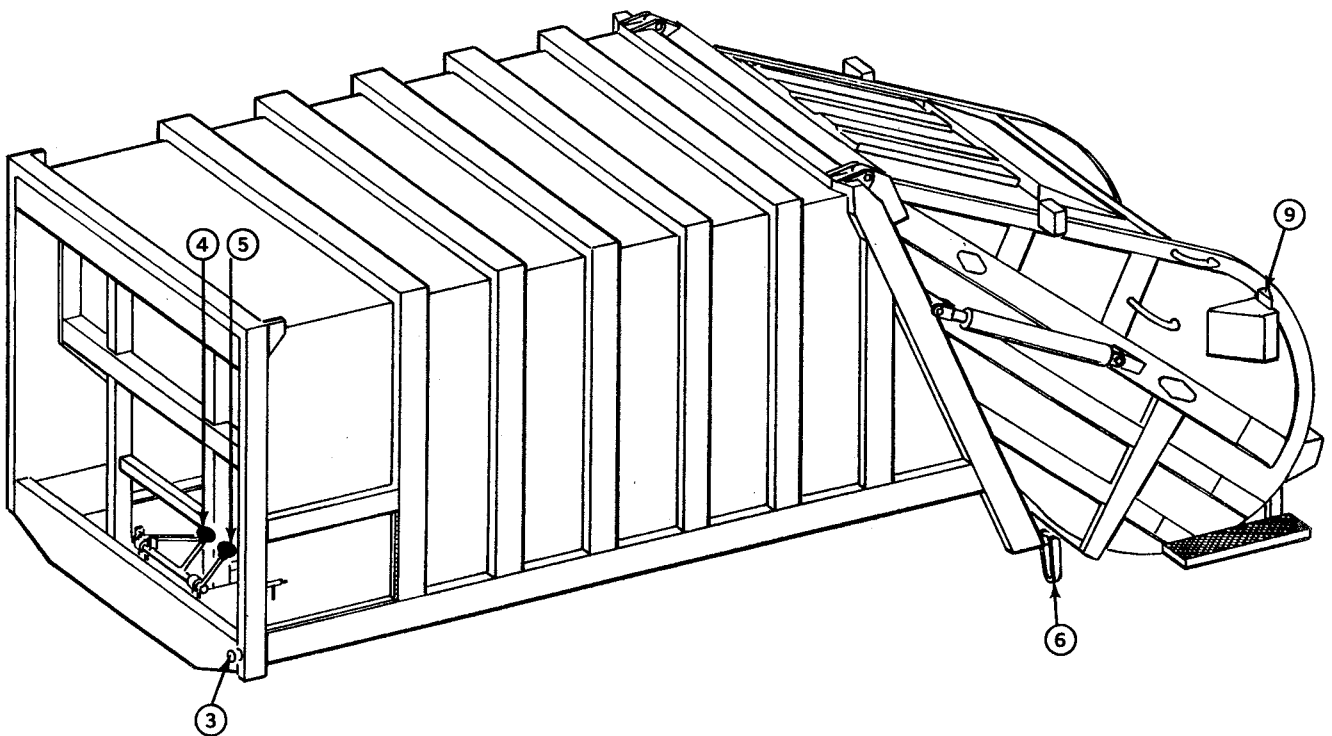
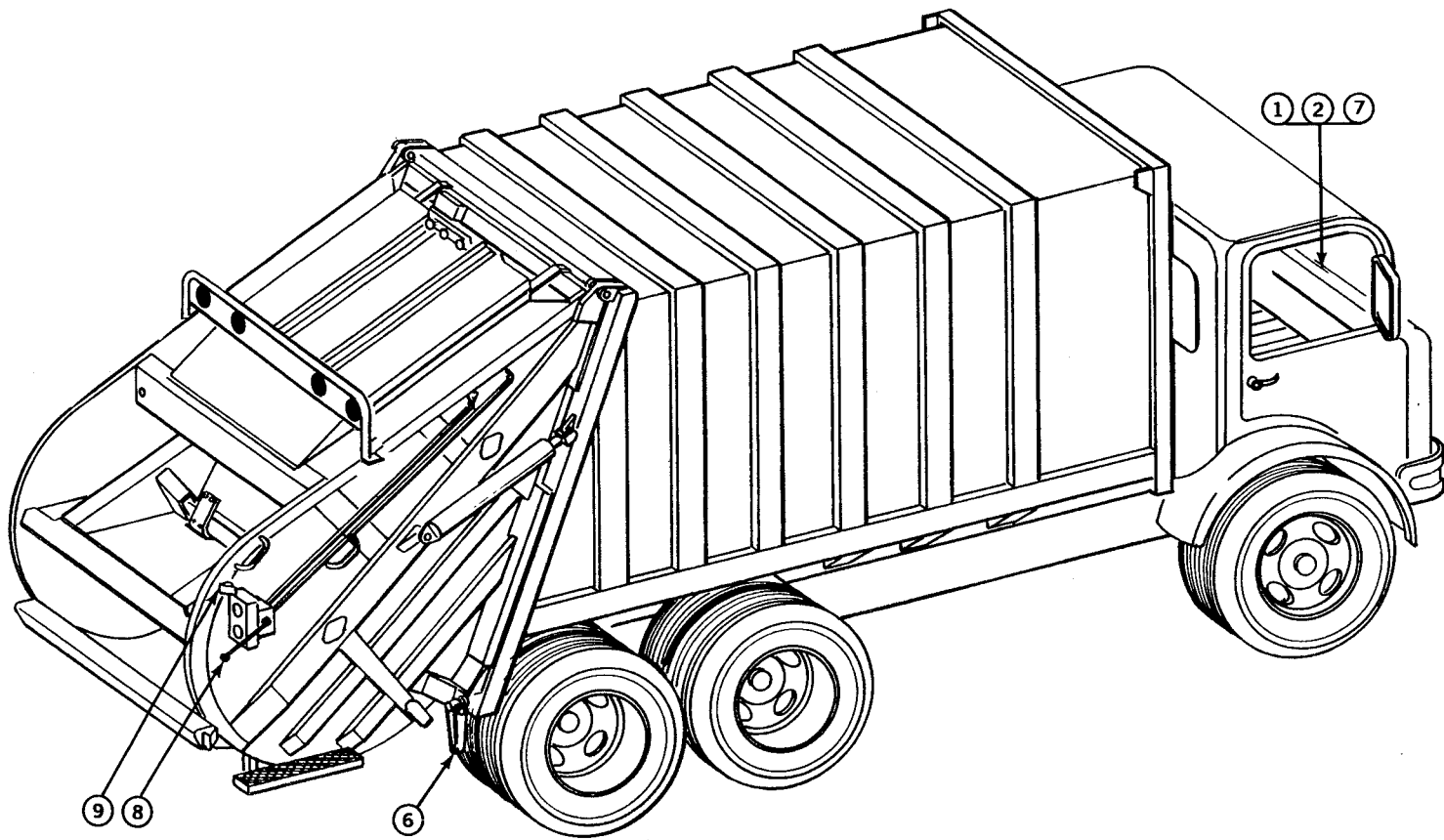
**SHUTDOWN**

1. Put all controls in neutral.
2. Set parking brake.
3. Disengage PTO.
4. Shut off engine.
5. Shut off solenoid dashboard switch.
6. Remove key.
7. Lock vehicle.



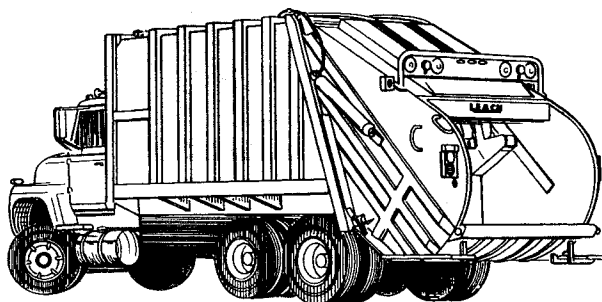


LOCATION OF OPERATING CONTROLS



**3 OPERATION****GENERAL**

This section will provide all of the instructions necessary to operate the 2R11 Packmaster. However prior to attempting any operation of the unit, make sure you are familiar with all of the safety information contained in Section 2, SAFETY PRECAUTIONS.

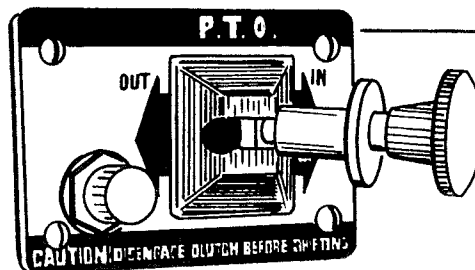
**DESCRIPTION OF OPERATING CONTROLS****⚠ DANGER**

The following information is for descriptive purposes only. It is not to be misconstrued as operating instructions. For operating instructions, refer to **OPERATING PROCEDURES** later in this section.

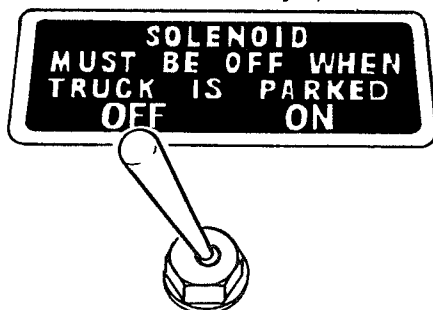
There are only a few controls required for the complete and efficient operation of the 2R11 Packmaster. It is important that you know the location and function of each control before attempting to operate the unit. Refer to the accompanying illustrations for their locations.

**PTO CONTROL (1)**

The PTO (Power take-off) is engaged to put the hydraulic pump in operation. The exact location of the PTO control will vary depending on the type of PTO, truck chassis style and control panel location. The PTO may be engaged by use of a lever, rocker switch, push-pull cable, toggle lever or positive control button depending on the style of PTO. Be sure to read all safety decals associated with the PTO before attempting operation.

**SOLENOID ON-OFF SWITCH (2)**

This switch energizes the engine speed-up system. It is located on the cab control panel (exact location is dependent on cab make and style).

**NOTE**

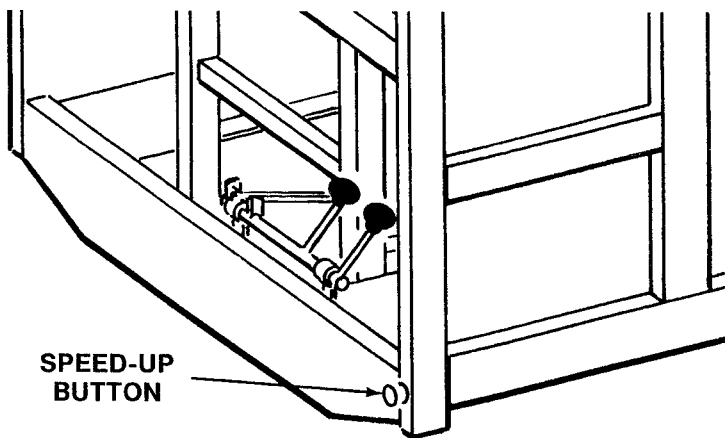
The engine speed-up system consists of the solenoid ON-OFF switch, a relay and solenoid mounted on the engine and connected to the carburetor (or governor on diesel engines), a speed-up pushbutton and speed-up switch connected to the operating control linkage on the Main Operating Valve. The function of the speed-up system is to speed-up the engine and provide more power to the hydraulic pump during operation of the various hydraulic cylinders.

**ENGINE SPEED-UP PUSHBUTTON (3)**

When depressed, this pushbutton switch will cause the engine to speed-up and supply more power to the hydraulic system. Located on the lower front left side of the body, it is depressed by the operator when operating either the pushout lever or tailgate lift lever.

**NOTE**

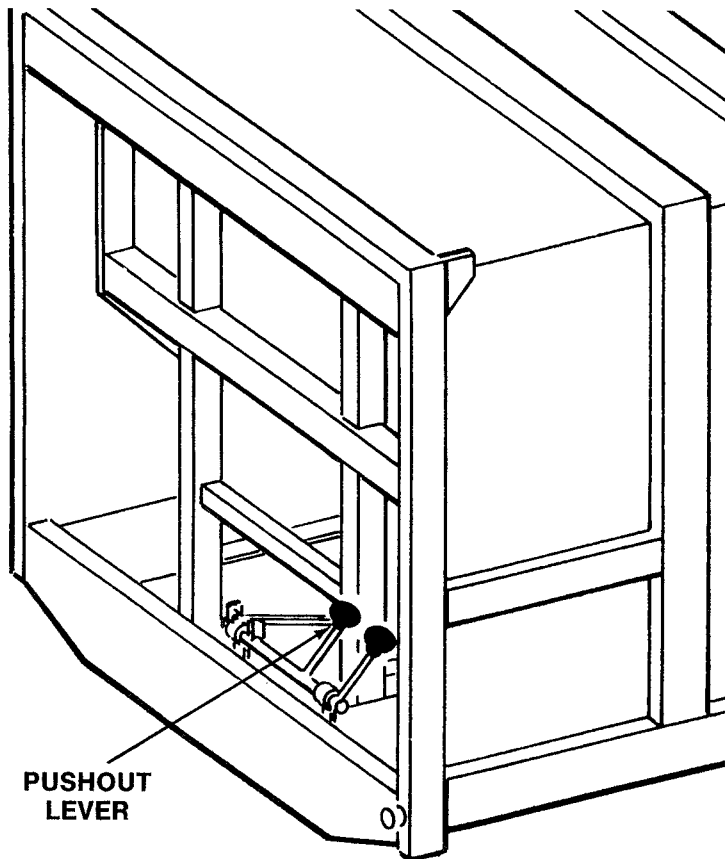
*Additional buttons may be installed with optional winches and container attachments.*

**PUSHOUT LEVER (4) (STANDARD SYSTEM)**

This lever, located at the left forward edge of the packer body, is used by the operator to control the pushout plate. When pushed rearward (toward the tailgate) this lever clamps the pushout plate to the bar and extends the pushout cylinder to unload the body. When the lever is pulled forward (toward the cab) the clamp connecting the pushout plate to the pushout bar, is released retracting the pushout cylinder, and allowing the pushout plate to move forward in the body from the pressure of compacted garbage.

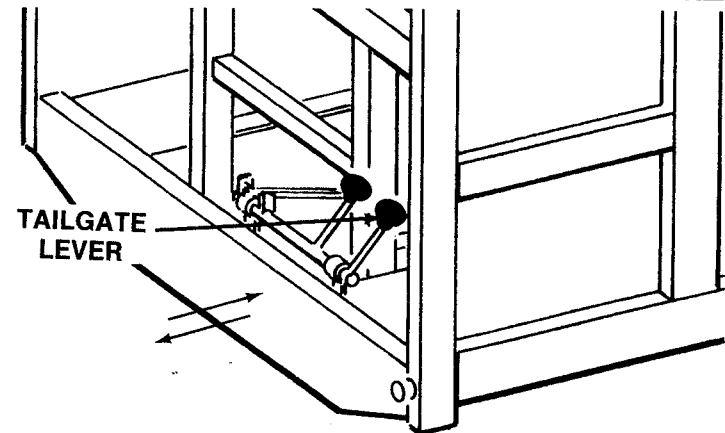
**(OPTIONAL TELESCOPIC SYSTEM) (4)**

With the telescopic option, the lever works the same as the standard system described above, except that the pushout plate is connected directly to the pushout cylinder and will retract into the body when the pushout lever is pulled forward.

**TAILGATE LIFT LEVER (5)**

This lever mounted to the outside of the pushout lever is used to control the tailgate during unloading. The lever is pulled forward toward the cab to raise the tailgate.

Pushing the lever rearward toward the tailgate will lower the tailgate.

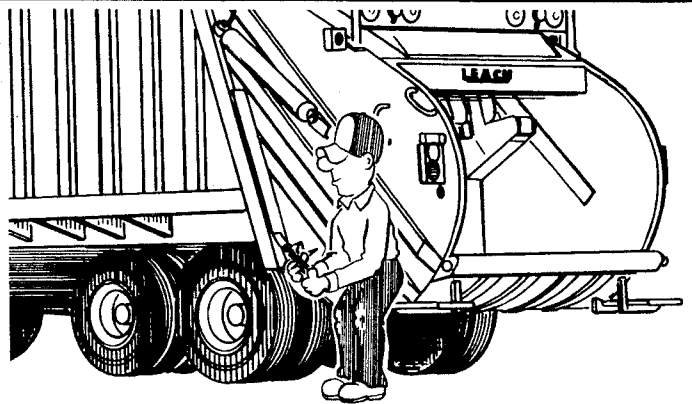


**OPERATION****TAILGATE CLAMPS (6)**

A tailgate clamp is located on each side of the tailgate at the bottom where the tailgate rests against the body. They are used to secure the tailgate to the body during operation. They must be manually loosened and swung away from the body to raise the tailgate for unloading.

**▲ CAUTION**

Before attempting to loosen the tailgate clamps, pressure against the tailgate must be relieved by opening the packer plate to the interrupted cycle stop position.

**TAILGATE "OPEN" LIGHT (7)**

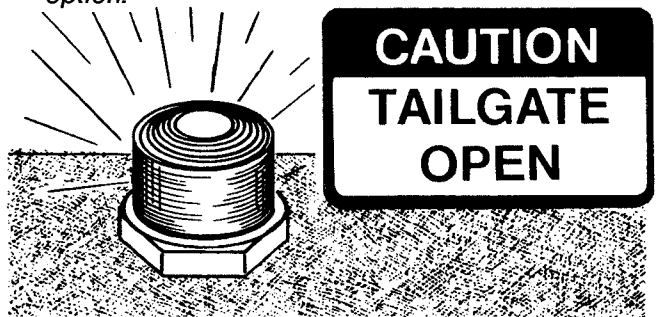
This warning light, located in the cab, will illuminate if the tailgate is ajar and the tailgate clamps are not secured in the closed position. Having the tailgate ajar will also sound the backup alarm and illuminate the backup lights.

**▲ CAUTION**

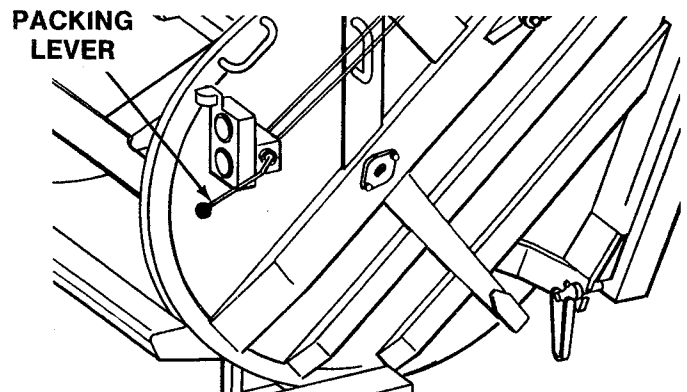
Operation of the unit with an illuminated or defective warning system can result in equipment damage.

**NOTE**

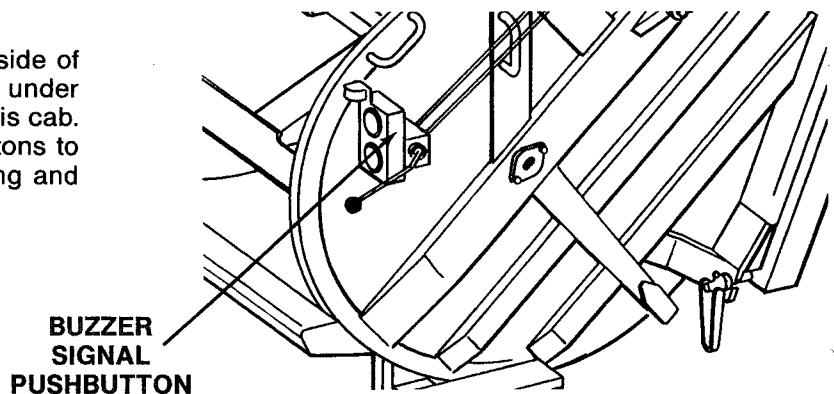
*This warning system has dual function on units equipped with the telescopic pushout option.*

**PACKING LEVER (8)**

The packing lever is located on the right (curb) side of the tailgate. It is used by the operator to cycle the carrier and packer plates during the packing operation. The lever is moved out and down to position the carrier and packer plates to the "interrupted cycle" position. The lever is moved in and down to sweep the load from the hopper and pack it against the pushout plate. Anytime the packing lever is moved it automatically engages the speed-up switch to provide more engine power to the hydraulic system. The effective use of this lever comes with operating experience.

**BUZZER SIGNAL PUSHBUTTONS (9)**

These two pushbuttons, one located on each side of the tailgate, are connected to a buzzer mounted under the drivers seat, or under the dash in the chassis cab. The operator depresses one of these pushbuttons to signal the driver when they are finished loading and ready for the truck to move ahead.



## OPERATING PROCEDURES

This section of the manual provides all the instructions necessary to start and operate the 2Rll Packmaster, including specific instructions for loading, packing and unloading the unit.

### NOTE

*It's important that operators and mechanics understand these procedures.*



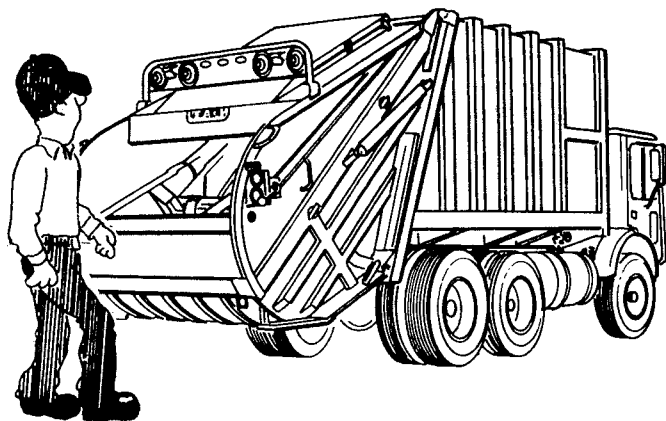
## PRE-OPERATING WALK-AROUND INSPECTION

Each day, before starting the unit perform the following "walk-around" inspection.

1. Refer to the decal location illustration in Sec. 2, SAFETY, of this manual and make sure all decals are in place and readable. Replace any decals that are not.

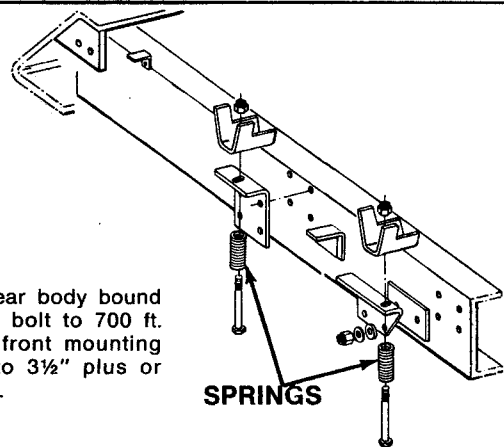
### NOTE

*A decal kit, free of charge, is available from your local authorized LEACH distributor.*

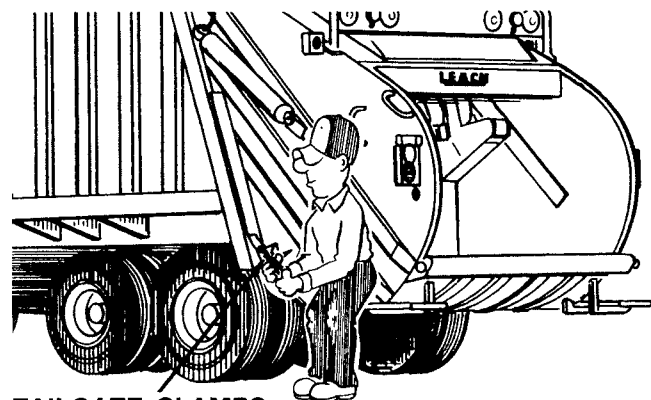


2. As you are checking for decals, also look for fluid leaks on and around the unit. Check for fluid leaks at the hydraulic cylinders, valves and fittings.
3. Inspect the mounting sills and attaching hardware. Make sure everything is tight and that there are no broken or excessively worn parts. Check cap-screws and fasteners for looseness, visible welds for cracks, and control levers for easy movement.

Torque rear body bound mounting bolt to 700 ft. lbs. and front mounting springs to  $3\frac{1}{2}$ " plus or minus  $\frac{1}{8}$ ".



4. Make sure the tailgate clamps are in the closed position and securely tightened.

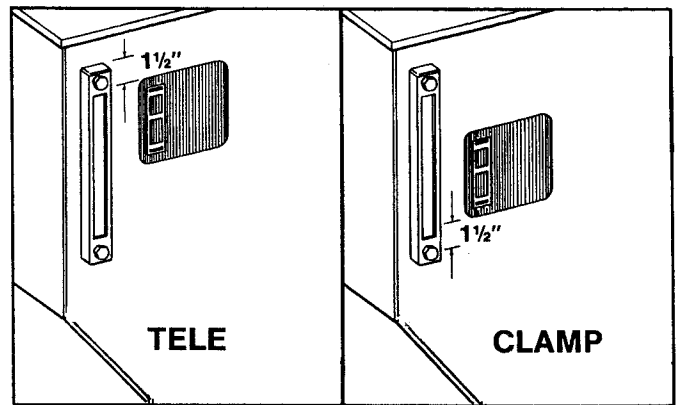


**TAILGATE CLAMPS**



## OPERATION

5. Check the hydraulic tank gauge to make sure the fluid is in the "safe" range. Add fluid, if necessary. (See Sec. 5, SPECIFICATIONS for the correct type of fluid to use.) The pushout cylinder must be retracted, the tailgate down, the carrier and packer plates in the "interrupted cycle" position to check the hydraulic fluid level.



HYDRAULIC FLUID LEVEL DECAL LOCATION

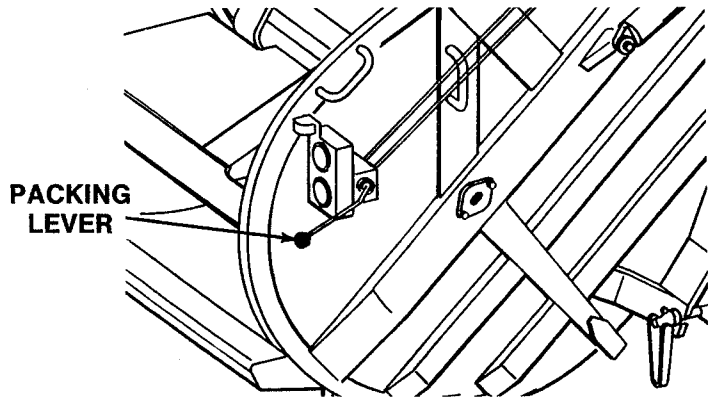
6. Make sure all operating levers are in the neutral position. Check:
- Packing lever;
  - Pushout lever;
  - Tailgate lift lever.

**CAUTION**

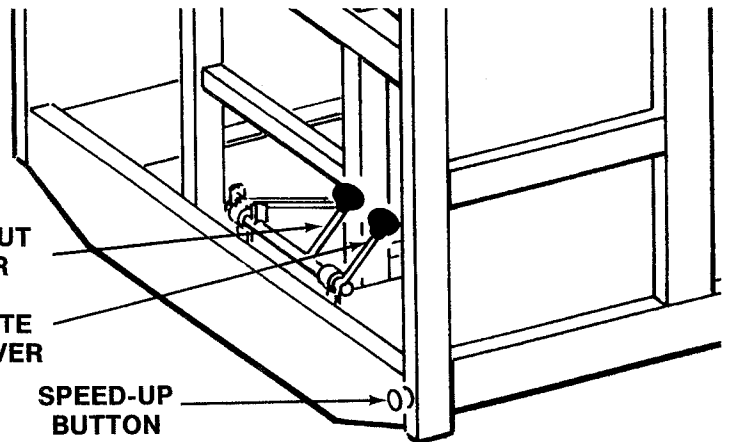
Never operate the 2R11 Packmaster with any part of the control system or levers removed, or serious damage will result.

**DANGER**

Never under any circumstances enter the body if the truck is running. Open the packer plate and release the pushout plate clamp before entering the body. Always make sure the truck engine is off and the keys are in your pocket before entering the body.



PACKING LEVER



PUSHOUT LEVER

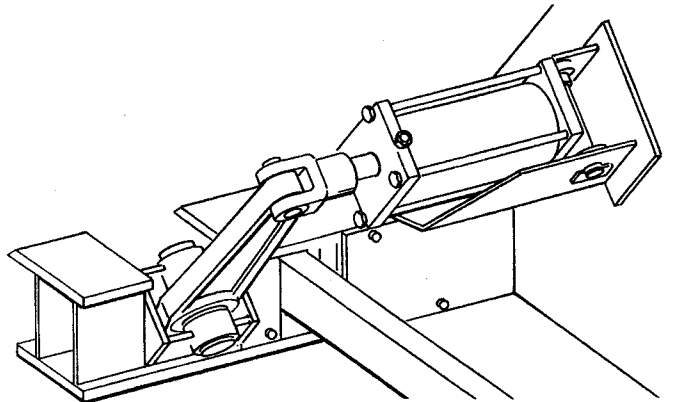
TAILGATE LIFT LEVER

SPEED-UP BUTTON

7. Look around the clamp and pushout plate area. Clean out any refuse caught in this area that could possibly hamper the clamp and pushout plate operation.

**DANGER**

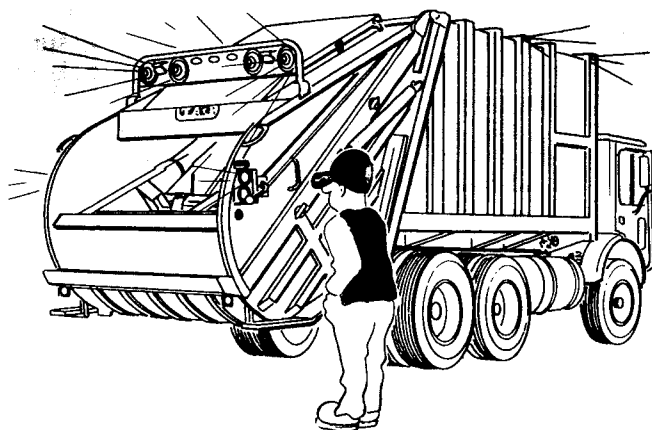
Never enter the body while the truck is running. Always make sure the truck engine is off and the keys are in your pocket. Also, open the packer plate and release the pushout plate clamp before entering the body.



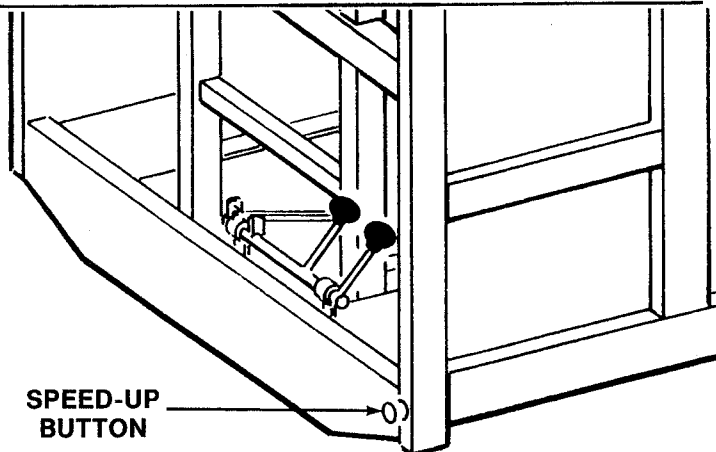
8. Start the truck according to the manufacturers instructions and while it is warming up, continue the walk-around inspection.
9. Check all of the operating and running lights. Make sure none are missing and that there are no burned out bulbs.

**▲ CAUTION**

The "tailgate open" warning light should be off. Do not operate the unit if the light is illuminated.



10. With the engine running, the speed-up solenoid switch ON, the PTO engaged and the transmission in neutral and the brakes applied, depress the speed-up push-button on the forward left (street) side of the body. You should hear the engine speed-up.

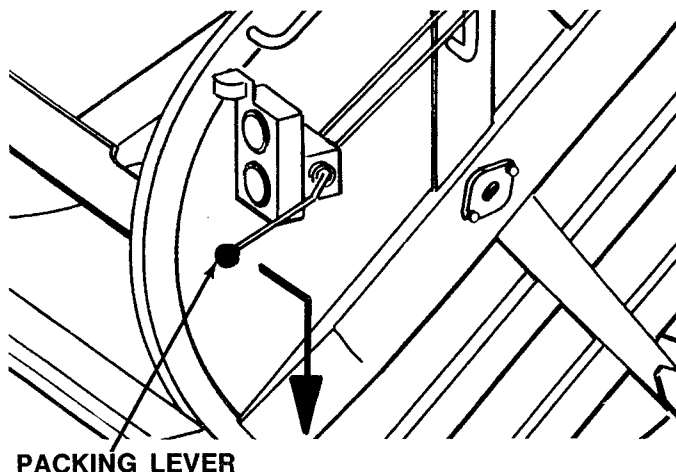


**▲ DANGER**

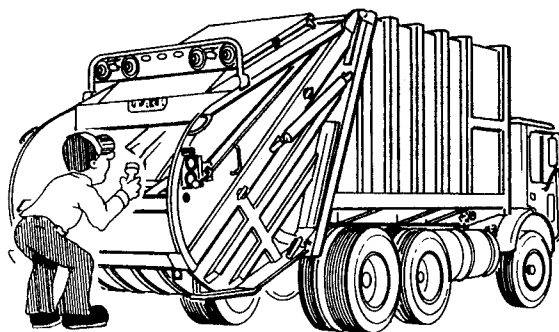
Never place hands in or near the packer plate during operation, death or severe personal injury could result.

**▲ CAUTION**

Never hold the packing lever in position by hand. Always engage and let go immediately. The only exception to this is at the end of a load. Not following this caution may lead to personal injury or damage to the equipment.



11. Move the packing lever out and down, and let go. Check for the following:
  - a. Engaging the packing lever will activate an engine speed-up switch, you should hear the engine speed-up;
  - b. Observe the carrier and packer plate movement — it should be smooth. The plates should stop automatically at the "interrupted cycle" position.
  - c. Observe the carrier and packer plate rollers. Make sure the rollers are turning freely and not sliding or sticking.
12. Move the packing lever in and down, and let go. Observe the carrier and packer plate movement — it should be smooth. The plates should stop automatically at the "home" position.

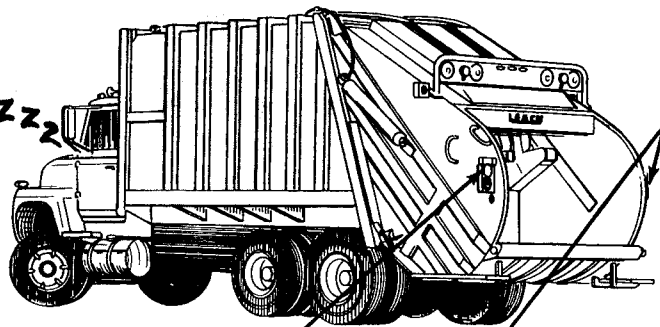


**OPERATION**

13. Depress the two buzzer signal pushbuttons located on both sides of the tailgate to make sure that the audible alarm located in the cab is working.

*Buzzzzzzzz*

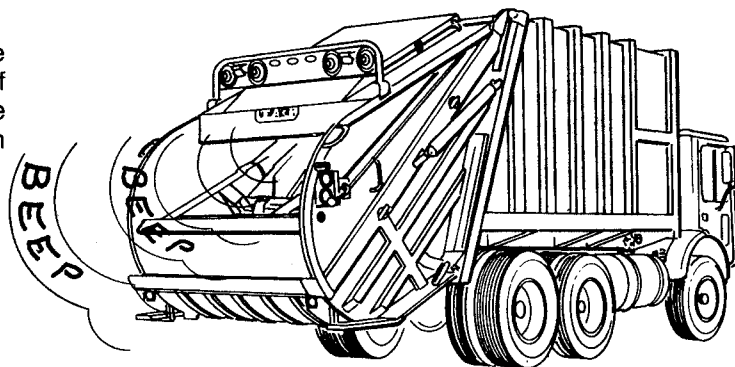
*Buzzzzzz*



**BUZZER SIGNAL PUSHBUTTONS**

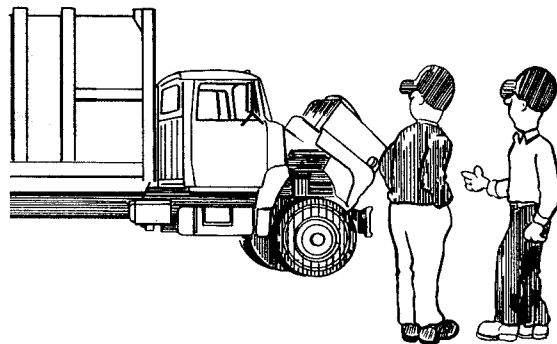
14. Back the unit up a few feet to ensure that the back-up alarm is working properly.

15. Loosen the tailgate clamps and swing out. Raise the tailgate approximately 6" and check to see if the tailgate ajar light on the dash is on and if the backup alarm is audible. (Do not have the unit in reverse).



**▲WARNING**

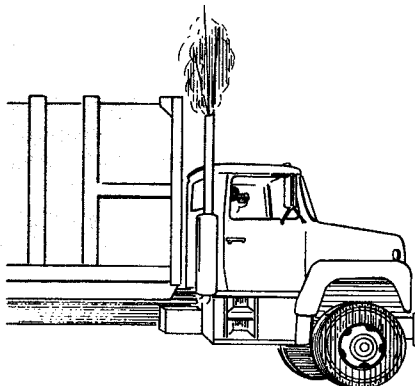
Do not operate a unit that is in need of service or repair. Death, serious injury or damage to the equipment could result.



16. Report any problems found during the pre-operation walk-around inspection to the maintenance supervisor for service or repair, then place a tag on the steering wheel (Inoperative) and remove the keys.

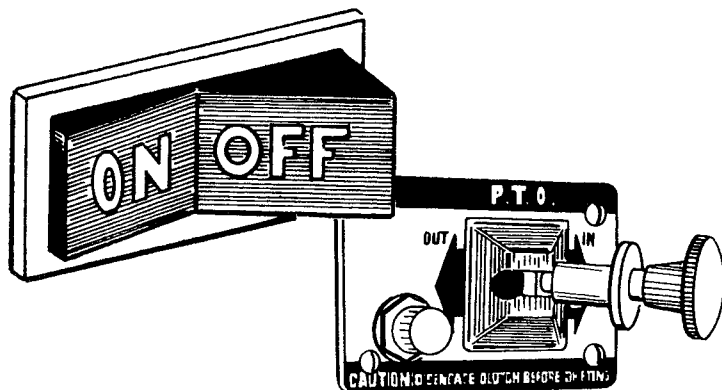
**START UP (OPERATING INSTRUCTIONS)**

1. Inspect and start the truck as described under the pre-operational walk-around inspection above.





2. Engage the PTO control (to start the hydraulic pump).



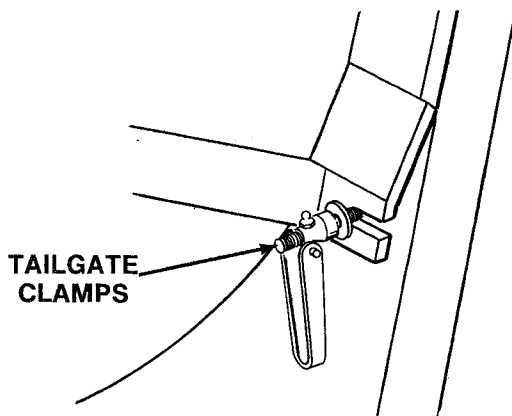
3. Place the solenoid switch in the ON position.



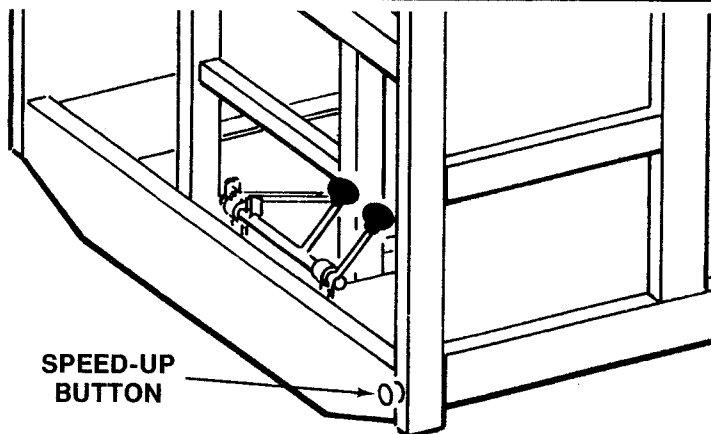
### POSITIONING PUSHOUT PLATE

To load the unit, the pushout plate must be positioned toward the rear of the body.

1. Check the tailgate clamps to make sure both are securely tightened.



2. Depress and hold the speed-up pushbutton.



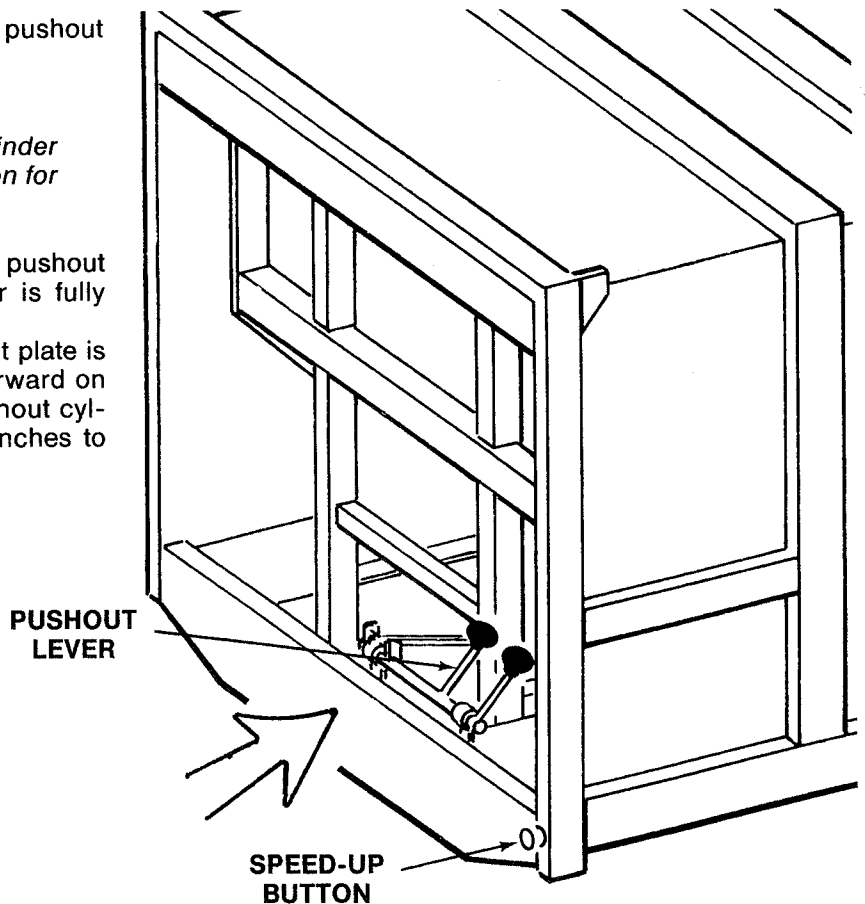
## OPERATION

3. Push the pushout lever rearward until the pushout cylinder is fully extended.

### NOTE

*On units with the telescopic pushout cylinder option, the pushout plate is now in position for loading.*

4. Release the speed-up button and pull the pushout lever forward until the pushout cylinder is fully retracted.
5. Repeat steps 2, 3, and 4 until the pushout plate is as far back as it will go and then pull forward on the pushout lever to fully retract the pushout cylinder. Now extend the cylinder a few inches to reset the clamp.



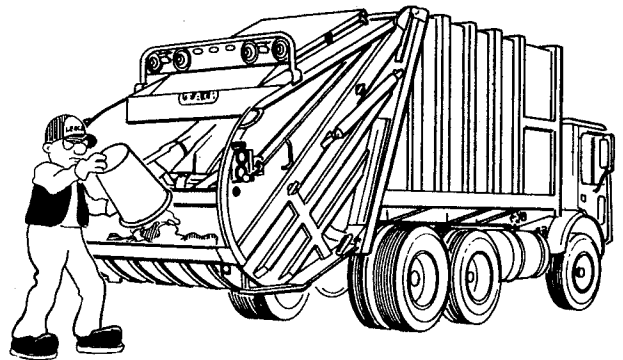
## LOADING THE HOPPER

There are only a few, but important points to remember during loading of refuse.

1. Load the hopper evenly on both sides.
2. Load heavy objects in the center of the hopper.
3. Do not load refuse higher than the loading edge.

### CAUTION

Overloading the hopper can cause serious damage.



## PACKING THE LOAD

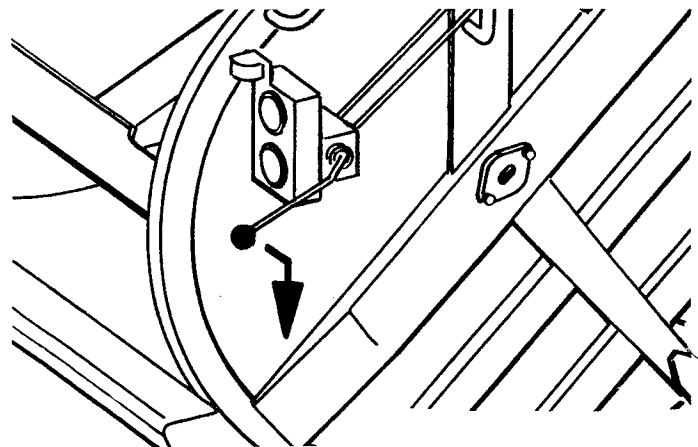
### NOTE

*The compaction cycle can be stopped at any point by moving the packing lever to the center.*

1. Cycle the packer plate by moving the packing lever out and down; then let go.

The packer plate will open and the packing lever will automatically shift.

The packer plate will move down to above the loading edge and stop in the "interrupted cycle position" with the packing lever shifting to neutral.



- To finish the cycle, move the packing lever in and down; then let go.

### CAUTION

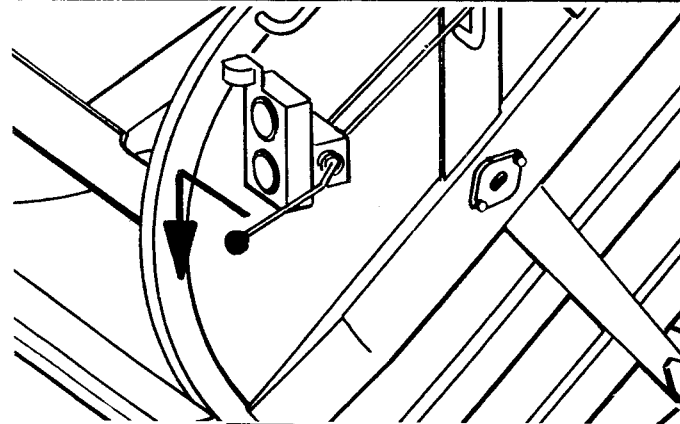
Stand clear of the hopper area during the packing cycle.

The packer plate will sweep the hopper and the packing lever will shift automatically. Then the packer plate will move up into body and stop in the "home position" with the packing lever shifting to neutral.

- Repeat steps 1 and 2 each time the hopper is filled to the loading edge.

### CLAMP PUSHOUT

As each load is packed into the body the load will become tighter and denser until the carrier plate stops short of the home position. With the packer in the interrupted cycle position, the operator pulls the pushout control lever to the front, releasing the clamp. The pushout plate will now slide forward as the packing cycle is completed. The operator once more pushes the pushout lever rearward to lock the bar to the pushout plate. (Packing is resumed). Packing the final hopper load on clamp pushout units is the only time that holding the packing lever in position (in and up) is permissible. This will ensure a tight pack.



### CAUTION

Failure to periodically manually release the clamp can cause damage to the pushout bar and clamping components.



### TELESCOPIC PUSHOUT

On units with the telescopic pushout cylinder option, the pushout plate is normally moved toward the front of the body automatically. When the resistance circuit is adjusted to produce maximum load density, it may become necessary to manually retract the telescopic pushout cylinder in order to allow the compacted refuse to move forward in the body. Also, if the packer plate stops short of the "home" position, the packer operating lever may need to be held (overridden) to allow the refuse to move the pushout plate toward the front of the body. When the pushout plate has reached the front of the body, the packer operating lever should not be overridden except to clear the final hopper load.

### UNLOADING AT DUMPSITE

### CAUTION

Do not unload uphill or against a pile of refuse.

- Apply the brakes, engage the PTO and insure the transmission is in neutral. Relieve the pressure on the tailgate by moving the packer plate to the "interrupted cycle position."
- Loosen both the tailgate clamps and swing them out and forward as far as they will go.



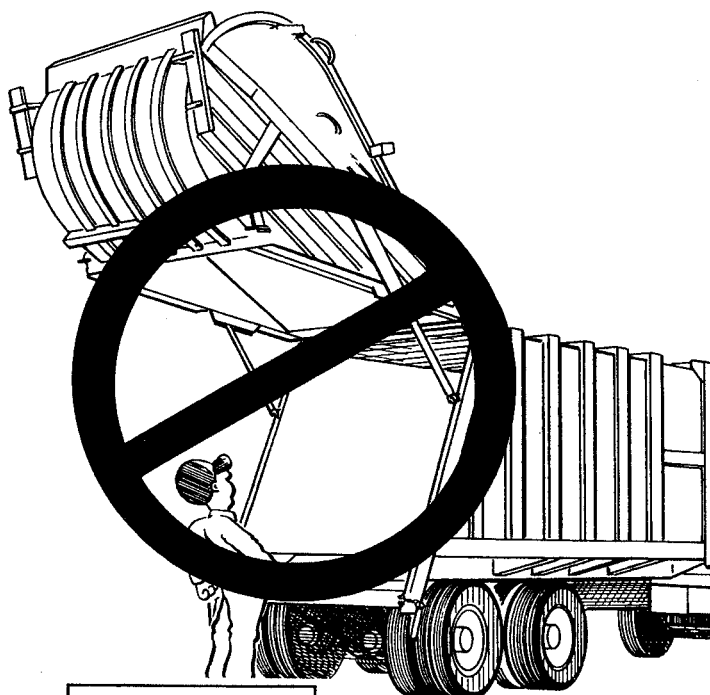
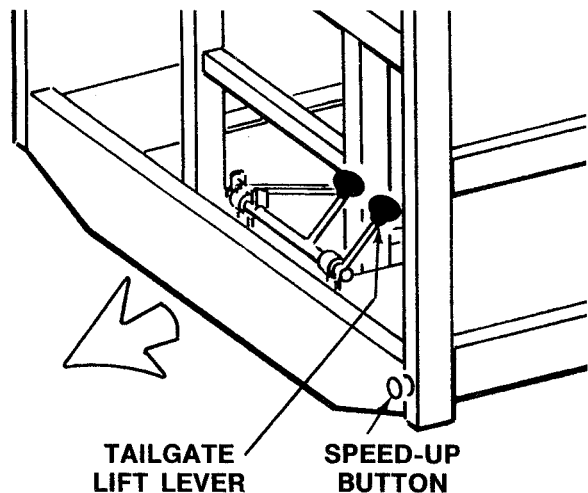
## OPERATION

## LIFTING THE TAILGATE

**⚠ DANGER**

Stand clear of the tailgate when raised. If you need to clean debris from the edges, use a pole while standing off to the side.

- Depress and hold the engine speed-up button.
- Pull the tailgate lift lever forward and hold until the tailgate is fully raised.

**⚠ CAUTION**

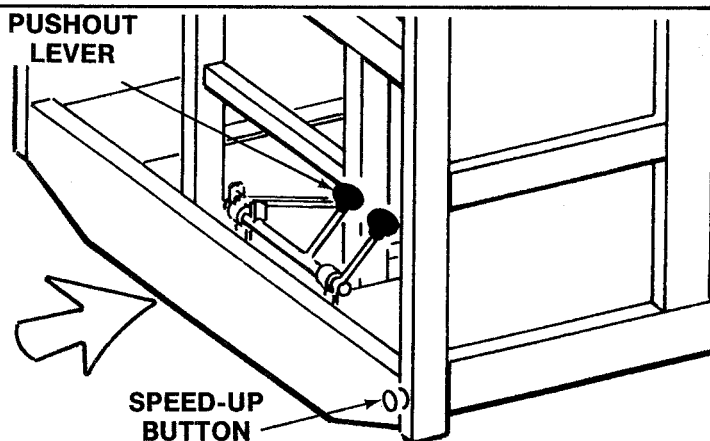
The "tailgate open" light and backup lights should illuminate. The backup alarm should also sound.

## EJECTING THE LOAD

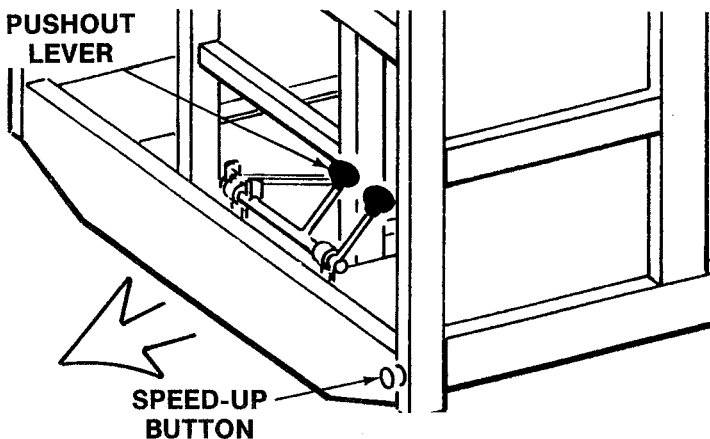
- Still holding the engine speed-up button, push the pushout lever rearward and hold until the pushout plate stops.

**NOTE**

On units with the telescopic pushout cylinder option, this will eject the entire load — go on to step 8.



- Release the speed-up button and pull the pushout lever forward until the pushout cylinder is fully retracted.
- Repeat steps 5 and 6 until the pushout plate is as far back as it will go; completely ejecting the load.
- Slowly pull the unit ahead to clear the refuse pile when the tailgate is lowered.
- Clear debris from the edges with a pole while standing clear off to one side.

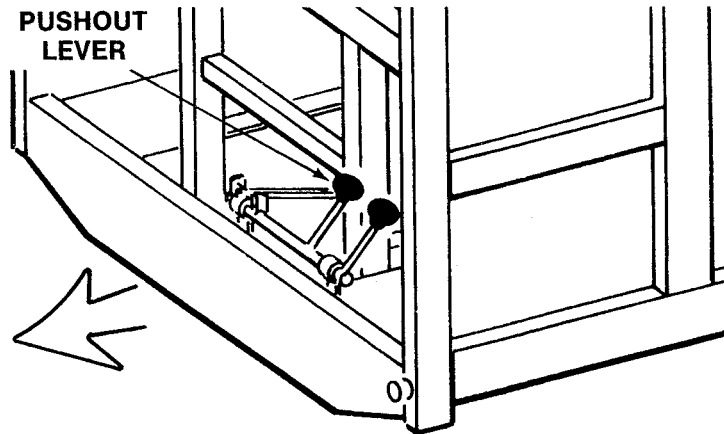
**⚠ CAUTION**

Never drive the unit more than 10 feet with the tailgate in a raised position.

10. Pull the pushout lever forward to completely retract the pushout cylinder. Now push the pushout lever rearward extending the pushout cylinder a few inches, thus clamping the bar to the pushout plate.

### CAUTION

With the telescopic circuit, the pushout cylinder remains fully extended. If the unit is going to travel over one mile empty, completely retract the cylinder. When packing is about to resume extend the cylinder and start packing.

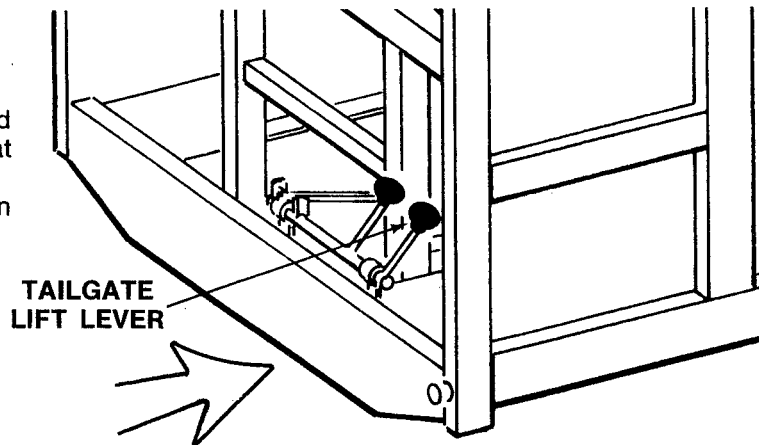


## LOWER THE TAILGATE

1. Push rearward on the tailgate lift lever slowly and in small increments to lower the tailgate a little at a time. AVOID SLAMMING SHUT the tailgate.
2. Place the tailgate clamps in the closed position and tighten securely.

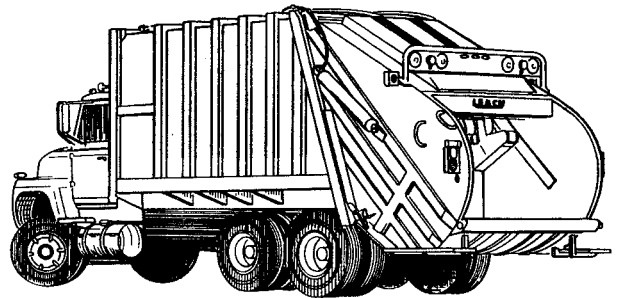
### NOTE

The "tailgate open" light, backup lights and backup alarm should be off after closing the tailgate.



## SHUTDOWN

1. Move the packing lever to place the packer plate in the home position.
2. Put all controls in neutral.
3. Set parking brake.
4. Disengage PTO.
5. Shut off engine.
6. Shut off solenoid dashboard switch.
7. Remove key.
8. Lock truck.





## GENERAL REPAIR PRACTICES

**⚠ WARNING**

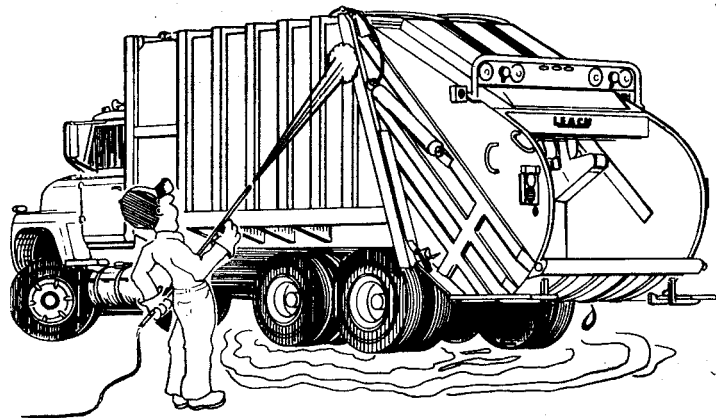
Proper service and repair is important for the safe, reliable operation of all mechanical products. The service procedures recommended and described in this service manual are effective methods for performing service operations. Some of these service operations require the use of tools specially designed for the purpose. These special tools should be used when and as recommended.

It is important to note that deviating from these procedures could cause damage to the unit or render it unsafe. However, please remember

that these procedures are not all inclusive. Since Leach Company could not possibly know, evaluate and advise the service trade of all possible ways in which service might be done or of the possible hazardous consequences of each way, we have not undertaken any such broad evaluation. Accordingly, anyone who uses a service procedure or tool which is not recommended by Leach must first thoroughly satisfy himself that neither his nor the operator's safety will be jeopardized by the service methods selected.

**PREPARATION FOR SERVICE**

Proper preparation is very important for efficient and safe service work. A clean work area at the start of each job will allow you to perform the repair as easily and quickly as possible, and reduce the incidence of misplaced tools and parts. If the portion of the unit to be repaired is excessively dirty, it should be cleaned before work starts. Cleaning will occasionally uncover trouble sources. Tools, instruments and parts needed for the job should be gathered before work is started. Interrupting a job to locate tools or parts is a needless delay. Special tools required for a job are listed in Section 11.

**REPLACEMENT PARTS**

Of growing concern to the Leach Company is the use of counterfeit, will-fit or substitute parts. The use of non-standard parts may affect the operation and performance, and void the warranty. Insure maximum reliability and protect your investment — insist on genuine Leach replacement parts.

**SERVICE BULLETINS**

In addition to the information given in this Service Manual, Service Bulletins are issued from time to time, which cover interim engineering changes and supplementary information. Service Bulletins should be consulted for complete information on the 2R11 Packmaster covered by this manual. (Check with your local Distributor.)



**GENERAL REPAIR PRACTICES**

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**SAFETY PRECAUTIONS****PRIOR TO PERFORMING ANY SERVICE OR REPAIR:**

1. Set the parking brake.
2. Put the vehicle in park, or if manual transmission put in gear and remove the ignition key.
3. Place an OSHA approved chock block in front of and behind the front tire.

4. If steel bar supports are to be used to support the tailgate, place them as shown in Sec. 9, SERVICE AND REPAIR, under TAILGATE REPAIR.

When working on the unit always use the service tools listed in Sec. 11, SERVICE TOOLS if so directed by the instructions in Sec. 9, SERVICE AND REPAIR.

Whenever dismantling any hydraulic line, valve, or cylinder be sure to turn off the hydraulic fluid flow, relieve the pressure, and slowly crack or loosen the fittings.

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**SAFETY DURING SERVICE AND REPAIR**

1. Always wear safety glasses.
2. Disengage the PTO, turn off the ignition and remove the keys before:
  - a. Leaving the truck cab.
  - b. Examination or lubrication of the PTO, pump or drive shafts.
  - c. Entering the front of the body.
  - d. Entering the tailgate.
3. Always check to make sure the body access door is locked shut before entering the cab.
4. Pump removal; due to the weight and location of the pump, it is advisable whenever possible to

place a floor jack beneath the pump and apply a slight pressure, now when the bolts are removed the pump is supported.

5. When it becomes necessary to raise the tailgate for maintenance or repair, Do Not enter the area beneath the tailgate unless the proper bracing has first been applied. All bracing and supports must be able to support 7500 lbs.
6. Never enter the body when load is under con-paction pressure. Bring Packer Plate to interrupted cycle stop position and retract pushout blade slightly.

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**WELDING PRECAUTIONS****ELECTRIC WELDERS**

1. Electric arc welders should have a separate, fused disconnect circuit.
2. Welders must be used according to the manufacturer's specifications.
3. All electric welding should be done in a well-ventilated stall.
4. The radiation given off by the arc will destroy the retina of the eye; so wear an approved welder's helmet or goggles.
5. Welding radiation will produce severe burns on unprotected skin, similar to sunburn, so wear heavy clothing. Use natural fiber or leather — avoid synthetic fiber clothing.

4. Hoses cannot be safely repaired: when they show signs of deterioration, they should be replaced.
5. Return regulators periodically to the distributor for inspection. Store gas bottles upright and out of the sun. Do not attempt to repair or make internal adjustments on the regulators yourself.

6. If you suspect a leak in the system, make a bubble test with Ivory soap. DO NOT USE ANY OTHER BRAND OF SOAP BECAUSE OF THE DANGER OF OXYGEN COMBINING WITH IT AND EXPLODING.
7. When preparing to use the torch, make certain that the regulator valves are all the way out to the "off" position before the main tank valves are opened to protect the regulators from the sudden impact of tank pressure.

**OXY-ACETYLENE TORCHES**

1. Acetylene is a highly explosive gas which should be treated with the greatest care. At pressures above 15 psi, acetylene will explode by decomposition without the presence of air. No other industrial gas has such a wide explosive range.
2. Oxygen will spontaneously ignite in the presence of oil and grease. The hoses, torch handles, and the regulators must be kept free of petroleum products.
3. Before using the equipment, inspect it for cleanliness and for leaks.

8. When opening the tank valves, stand alongside of the regulators, out of the way, in case they blow out.
9. Backfiring or "machine gunning" at the torch is very dangerous and can lead to a major explosion.
10. Welding should be done in a location well away from flammable materials.



## GENERAL REPAIR PRACTICES

## REMOVAL, DISASSEMBLY AND REPAIR

1. Cleanliness is very important; dirt is the number one cause of wear in bearings, bushing and especially in hydraulic components.
2. Inspect hydraulic components for leaks before cleaning. The dirt build up on the component can aid in tracing oil leaks.
3. Clean hydraulic connections before removal to prevent dirt from entering component.
4. Loosen hydraulic fittings slowly to release pressure.
5. Cap hydraulic fittings immediately after removal to prevent dirt from entering component or line and to prevent fluid from leaking.
6. Clean component in non-flammable solvent before disassembly.
7. Inspect component after cleaning for signs of wear or external damage.
8. When disassembling a component, note the position of each part as it is removed to aid in reassembly.
9. During disassembly note the condition of each part as it is removed to aid in diagnosing problems and to help prevent them in the future.
10. Clean and inspect disassembled parts for wear, cracks, dirt, etc.
11. After cleaning and inspection, re-usable hydraulic parts should be immediately coated with clean fresh hydraulic fluid to prevent rust formation. If these parts are not going to be reinstalled immediately, they should be wrapped in a clean lint-free cloth or paper to prevent nicks or scratches.
12. When repacking a cylinder, or resealing a valve, replace all seals and o-rings that are disturbed during the repair. The price of a few seals is very little, compared to a return repair job.

## REASSEMBLY AND INSTALLATION:

1. Assemble parts in same position as removed.
2. Align parts accurately before mating.
3. Inspect o-ring and seal grooves for sharp edges, nicks or burrs before installing new sealing parts.
4. Lubricate all new sealing parts with clean, fresh hydraulic fluid before installation
5. Use care not to damage new sealing parts on reassembly.
6. Use correct torque values when reassembling and installing components. See CAPSCREW MARKING AND TORQUE VALUES in this section.
7. Always check hydraulic fluid level in the hydraulic fluid tank after performing any service or repair of the hydraulic system.
8. Always lubricate components with grease fittings after they have been repaired and reinstalled.
9. Use only genuine Leach replacement parts.

**NOTE**

*See Section 9, SERVICE AND REPAIR for specific repair instructions*

## ELECTRICAL TESTING

The electrical system used on the 2R11 Packmaster consists of various lights, switches and wiring. Testing the components and wiring can be accomplished by two simple checks; CHECKING FOR CURRENT and CHECKING CONTINUITY.

**CHECKING FOR CURRENT**

A 12 volt test light is used to check for the presence of electricity in a live circuit. Connect the test light clip to a good ground and the probe at the point where the presence of current is to be checked. If current is present, the light will be on . . . if no current is present, the light will be off.

**CHECKING CONTINUITY**

A continuity tester is used to check the ability of a conductor to allow current to pass through it. A continuity tester uses a self contained power source, and should never be used on a live circuit. Connect the clip to one side of the component to be tested and touch the probe to the other side. If the component has the potential to pass current, has continuity, the light will be on . . . if the component is not able to pass current, there is no continuity and the light will be off.



**GENERAL REPAIR PRACTICES****WELDING**

1. When rewelding an old weld, be sure the old weld is completely cleaned out.
2. When repairing a cracked weld, the old weld should be completely removed before rewelding.
3. When adding a part or attachment be sure; the metal is clean before welding, the part is properly located and the weld will not cause damage to adjacent parts.
4. Use the following rods (rod-AWS number) for welding:

Body (except top hinge area) .....	E6010, E6011, E6013
Top hinge area .....	E11018, E7018
Tailgate .....	E6010, E6011, E6013
Carrier plate .....	E6010, E6011
Packer plate .....	E11018, E7018

**LIFTING INSTRUCTIONS**

Because of the size and weight of some of the major components found on the 2R11 Packmaster, it is necessary to use suitable lifting devices for removal. The following components require lifting devices for removal: cylinders, carrier plate, packing plate, pushout plate and tailgate.

**CAPACITY OF LIFTING DEVICE REQUIRED FOR REMOVAL**

Cylinders .....	500 lbs.
Telescopic Pushout Cylinder .....	1000 lbs.
Carrier plate .....	1600 lbs.
Packer plate .....	1600 lbs.
Pushout plate .....	2800 lbs.
Tailgate .....	7500 lbs.

Nylon sling straps should be used for the removal of cylinders. The following specifications should be used to determine type of sling straps to use for lifting.

**SLING STRAP SPECIFICATIONS**

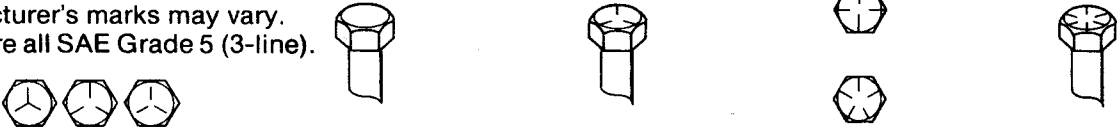
Type .....	USS-26-EN1
Rating	
Vertical lift .....	4800 lbs.
Choker lift .....	3600 lbs.
Basket lift .....	9600 lbs.
Width .....	2 in.
Length .....	depends on type of lifting device used.

Chains should be used to lift and/or support the carrier and packer plates, pushout plate and tailgate. The following specifications should be used to determine the type of chain and hardware to use for lifting.

**CHAIN AND HARDWARE SPECIFICATIONS**

Chain	
Type .....	D.O.F. (Double Branch, Oblong Link, Foundry Hook)
Size .....	½ in.
Hammer locks .....	½ in.
Oblong rings .....	½ in.

## CAPSCREW MARKING AND TORQUE VALUES

Usage	Much Used	Much Used	Used at Times	Used at Times
Capscrew Diameter & Minimum Tensile Strength PSI	To 1/2-69,000	To 3/4-120,000	To 5/8-140,000	150,000
	To 3/4-64,000	To 1-115,000	To 3/4-133,000	
Quality of Mat'l	Indeterminate	Min. Commercial	Med. Commercial	Best Commercial
SAE Grade Number	1 or 2	5	6 or 7	8
CAPSCREW HEAD MARKINGS				
Manufacturer's marks may vary. These are all SAE Grade 5 (3-line).				
				
Capscrew Body Size (Inches) - (Thread)	Torque Ft-Lb (kg m)	Torque Ft-Lb (kg m)	Torque Ft-Lb (kg m)	Torque Ft-Lb (kg m)
1/4 - 20	5 (0.69)	8 (1.11)	10 (1.38)	12 (1.66)
- 28	(0.83)	10 (1.38)	14 (1.94)	
5/16 - 18	11 (1.52)	17 (2.35)	19 (2.63)	24 (3.32)
- 24	13 (1.80)	19 (2.63)	27 (3.73)	
3/8 - 16	18 (2.49)	31 (4.29)	34 (4.70)	44 (6.09)
- 24	20 (2.77)	35 (4.84)		49 (6.78)
7/16 - 14	28 (3.81)	49 (6.78)	55 (7.61)	70 (9.68)
- 20	30 (4.15)	55 (7.61)		78 (10.79)
1/2 - 13	39 (5.39)	75 (10.37)	85 (11.76)	105 (14.52)
- 20	41 (5.67)	85 (11.76)		120 (16.60)
9/16 - 12	51 (7.05)	110 (15.21)	120 (16.60)	155 (21.44)
- 18	55 (7.60)	120 (16.60)		170 (23.51)
5/8 - 11	83 (11.48)	150 (20.75)	167 (23.10)	210 (29.04)
- 18	95 (13.14)	170 (23.51)		240 (33.19)
3/4 - 10	105 (14.52)	270 (37.34)	280 (38.72)	375 (51.86)
- 16	115 (15.90)	295 (40.80)		420 (58.09)
7/8 - 9	160 (22.13)	395 (54.63)	440 (60.85)	605 (83.67)
- 14	175 (24.20)	435 (60.16)		675 (93.35)
1 - 8	235 (32.50)	590 (81.60)	660 (91.28)	910 (125.85)
- 14	250 (34.58)	660 (91.28)		990 (136.92)

## NOTES:

- Always use the torque values listed above when specific torque values are not available.
- The above is based on use of clean, dry threads.
- Reduce torque by 10% when engine oil is used as a lubricant.
- Reduce torque by 20% if new plated capscrews are used.
- General Formula for calculating Torques is as follows: Torque in Inch Lbs. = .2 x Nominal Diameter of Screw x Loads in Ls., where Load = 80% of Yield Strength, expressed in Lbs., not pounds per square inch.

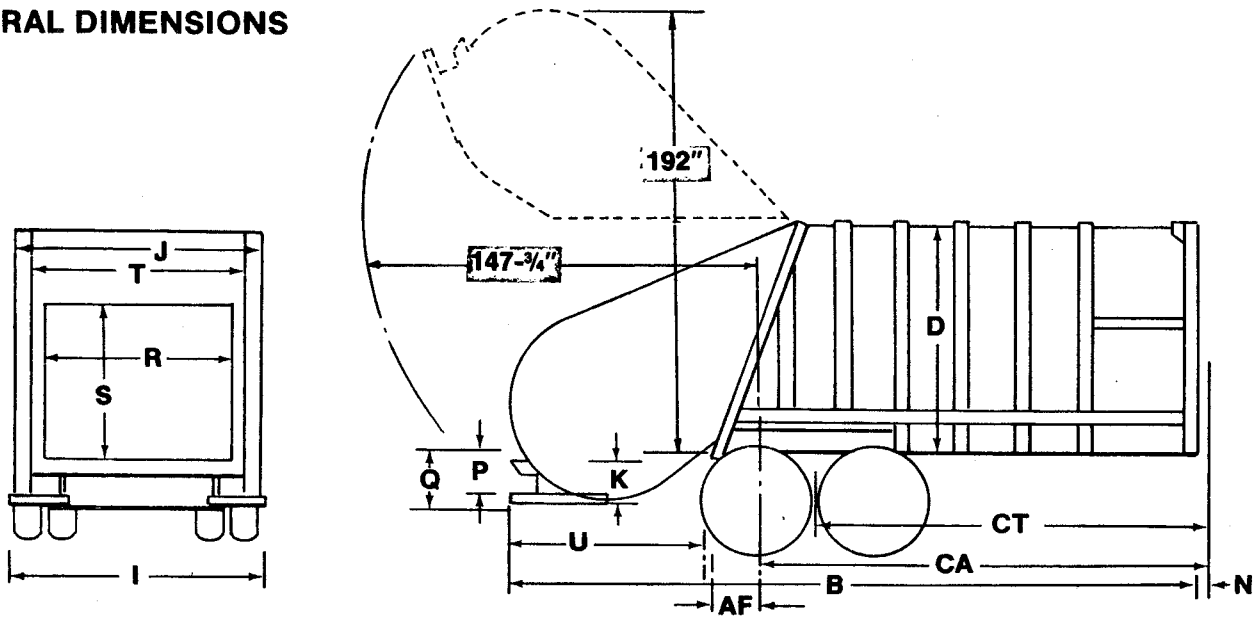


**GENERAL REPAIR PRACTICES**

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## GENERAL DIMENSIONS



BODY DIMENSIONS	20 Cu. Yd.	25 Cu. Yd.	31 Cu. Yd.	15m <sup>3</sup>	19m <sup>3</sup>	24m <sup>3</sup>
AF After Frame	24"	24"	24"	610mm	610mm	610mm
B Overall Length	249"	270"	316"	6325mm	6858mm	8026mm
CA To Centerline of Rear Axle	150"	171"	217"	3810mm	4340mm	5512mm
CT To Centerline of Trunion (50" Beam)	125"	146"	192"	3175mm	3708mm	4877mm
D Height Above Chassis Frame (with 3" sill)	101"	101"	101"	2560mm	2560mm	2560mm
I Body—Outside Width	96"	96"	96"	2439mm	2439mm	2439mm
J Body Inside Width	90"	90"	90"	2286mm	2286mm	2286mm
K Hopper Depth	17"	17"	17"	432mm	432mm	432mm
N Interference Point Above Chassis Frame	4"	4"	4"	102mm	102mm	102mm
P Top of Step Below Chassis Frame	19"	19"	19"	483mm	483mm	483mm
Q Hopper Bottom Below Chassis Frame	23"	23"	23"	585mm	585mm	585mm
R Hopper Opening Width	80"	80"	80"	2032mm	2032mm	2032mm
S Hopper Opening Height	56"	56"	56"	1423mm	1423mm	1423mm
T Hopper Inside Width	80"	80"	80"	2032mm	2032mm	2032mm
U Rear of Body to Rear of Tailgate Closed	74"	74"	74"	1880mm	1880mm	1880mm
■ Height Above Chassis Frame (Tailgate Raised)	194"	194"	194"	4928mm	4928mm	4928mm
■ Loading Lip Below Chassis Frame	5"	5"	5"	127mm	127mm	127mm
■ Center of Gravity Measured From Front of Body						
—Body Only	117"	131"	151"	2972mm	3328mm	3836mm
—Payload	94"	103"	120"	2388mm	2617mm	3048mm
■ Hopper Capacity	2.7 Cu. Yd.	2.7 Cu. Yd.	2.7 Cu. Yd.	2.0 m <sup>3</sup>	2.0 m <sup>3</sup>	2.0 m <sup>3</sup>
■ Approx. Body Weight	14,495 lbs	15,020 lbs	16,125 lbs	6575 kg	6813 kg	7314 kg
■ Min Truck GVWR Requirement	46,000 lbs	52,000 lbs	60,000 lbs	21000 kg	24000 kg	28000 kg

- NOTES: \*Truck selected must be capable of carrying net weight of body plus weight of refuse to be collected.  
 \*A full variable speed governor is preferred on trucks equipped with a diesel engine.  
 \*CA must be useable with no obstructions protruding above frame.  
 \*Specifications subject to change without notice.



## PREVENTIVE MAINTENANCE

**GENERAL**

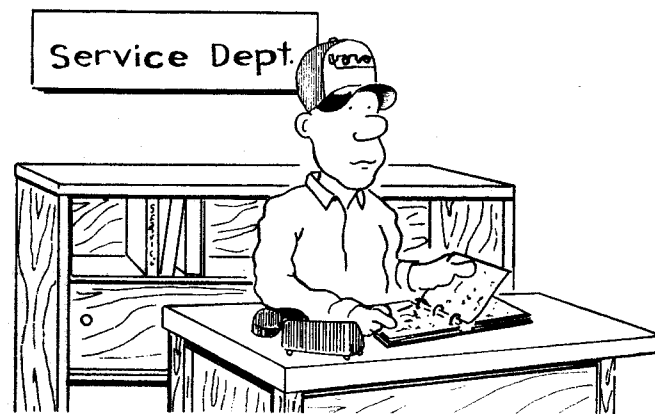
The 2R11 Packmaster has been designed for long periods of efficient uninterrupted operation. Careful attention to proper preventive maintenance, as described in this section, will insure and extend trouble-free operation of the unit. Particular attention to correct lubrication of the unit and maintenance of the return line filter, are probably the two most vital areas of preventive maintenance required. The objectives of preventive maintenance is to anticipate and prevent operational difficulties before they require extended shut down for costly repairs.

**OPERATING AND MAINTENANCE RECORDS**

Prepare and adhere to a maintenance schedule. Keep detailed records of all maintenance performed. Regularly inspect operating and maintenance records for deviations from normal operating conditions. Analyze the records for indications of potential trouble.

**NOTE**

*Occasionally distributors will receive service bulletins from LEACH concerning updated maintenance information. Keep those bulletins with this manual and make notes at the appropriate places in the manual referencing the updated information.*

**PREVENTIVE MAINTENANCE REQUIREMENTS****DAILY PREVENTIVE MAINTENANCE**

Each day perform the following maintenance:

**1. INSPECTION.**

Perform the PRE-OPERATIONAL INSPECTION described in Sec. 3, OPERATION.

**⚠ DANGER**

**Never go under vehicle with engine running. Death or serious injury could possibly result.**

- a. When checking for hydraulic leaks pay particular attention to hose fittings and connections at the cylinders and valves. A build up of hydraulic fluid and dirt indicates a small leak that can probably be corrected by tightening the fitting or connection.
- b. Check visual indicator to determine condition of the return line element.
- c. Check all major moving parts for smoothness and ease of operation.

**2. CLEANING.**

Hose entire unit inside and out with clean water. Make sure no refuse is lodged in body trough or behind pushout plate especially near clamp area or rear of tank. Make sure there is no grease on the pushout bar.

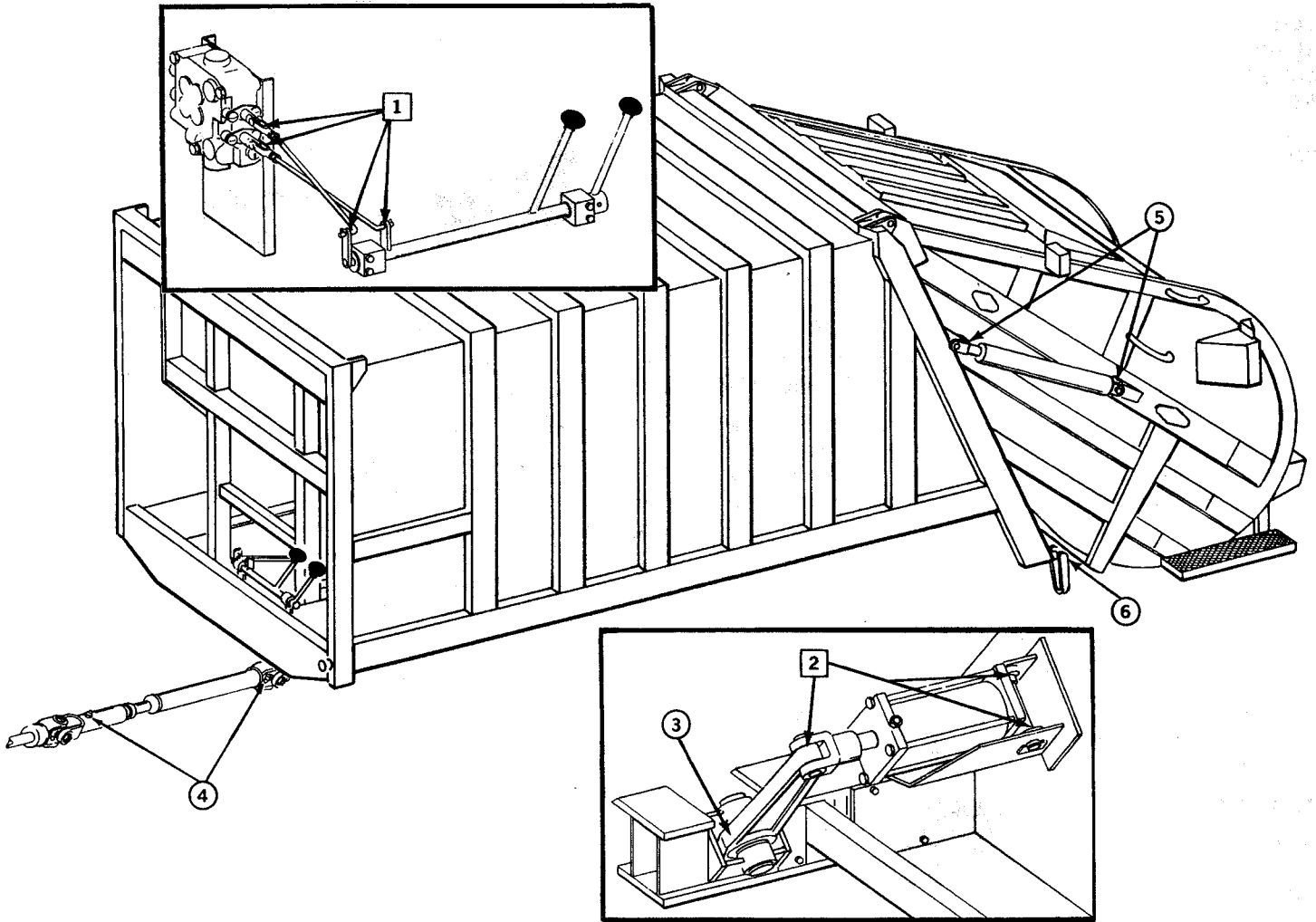
**3. LUBRICATION.**

Frequent inspection of grease points will indicate when lubrication is needed.



## PREVENTIVE MAINTENANCE

### LUBRICATION CHART



#### INSTRUCTIONS

- Grease weekly (every 40 hrs. of operation) with MOBILUX EPI-SERVICE grease or equivalent.
- Oil weekly (every 40 hrs. of operation) with SAE #10 or equivalent.

#### CAUTION

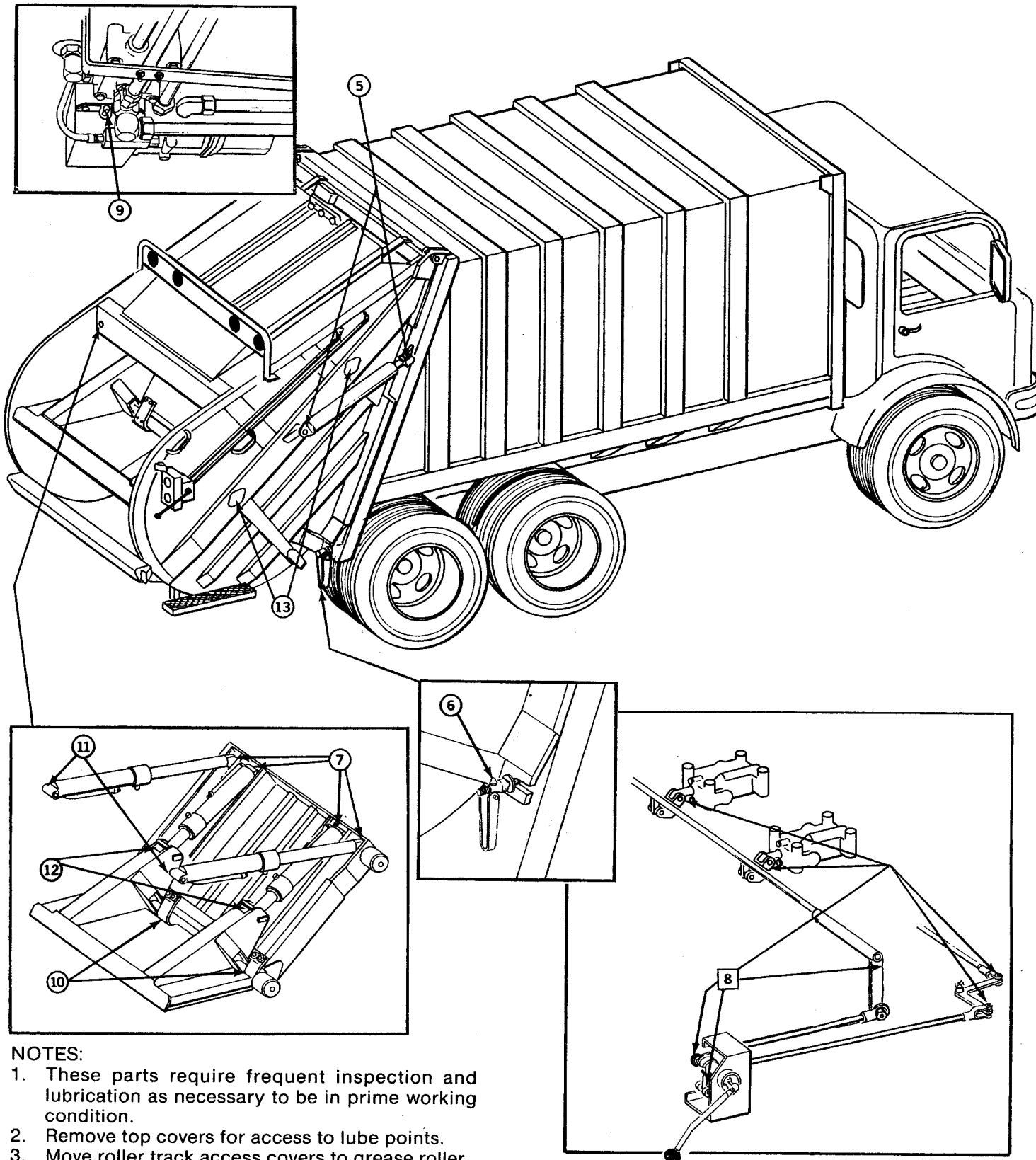
In below freezing climates all grease and oils should have a cold test rating of at least -20° F.

ILLUS. #	LUBE POINT	QTY.	NOTE
■1	Control levers	4	1
■2	Clamp cylinder	3	
●3	Clamp mechanism	1	
●4	PTO shaft	2	
●5	Tailgate lift cylinders (top & bottom)	4	
●6	Tailgate clamps	2	
●7	Operating cylinders top pivots	4	2

ILLUS. #	LUBE POINT	QTY.	NOTE
<b>NOTE</b>			
<i>The packer plate must be in the home position to lubricate the following lube points.</i>			
■8	Packing lever control linkage	9	2
●9	Main operating valve	1	
●10	Inside & outside bearing housing	4	
●11	Carrier plate cylinder end	2	
●12	Packer plate cylinder rod ends	2	
●13	Rollers	4	3 & 4



## LUBRICATION CHART

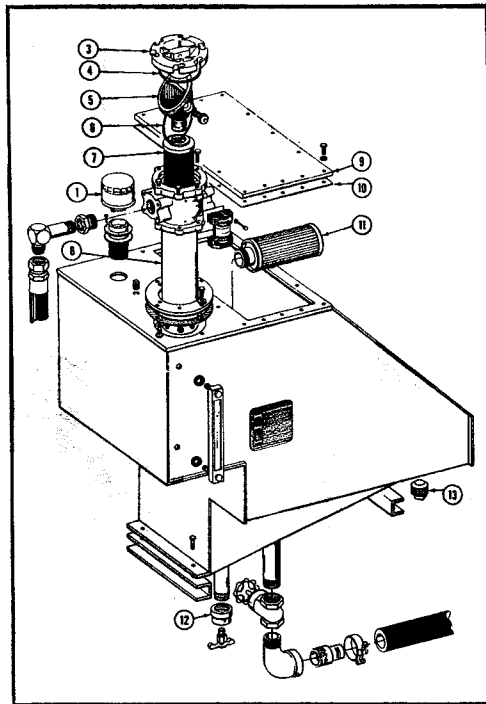
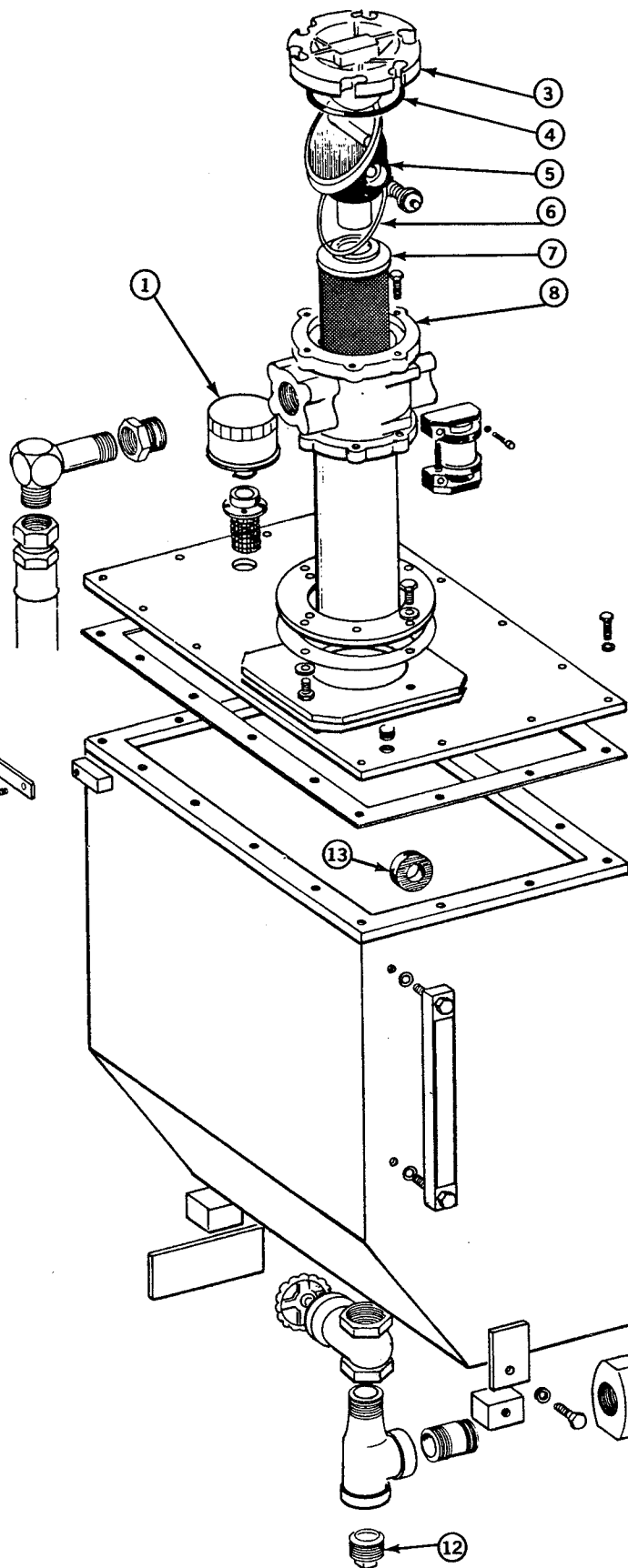


## NOTES:

1. These parts require frequent inspection and lubrication as necessary to be in prime working condition.
2. Remove top covers for access to lube points.
3. Move roller track access covers to grease roller.
4. Rollers need lubrication — roller tracks do not! Grease on tracks will only cause rollers to slide, keep tracks clean and dry.

# SECTION 6

## PREVENTIVE MAINTENANCE



## PREVENTIVE MAINTENANCE

## HYDRAULIC SYSTEM SERVICE (See accompanying hydraulic system illustration)

Proper maintenance of the hydraulic components is of vital importance to the service life of the system and the operation of the Packmaster as a whole.

### CHECKING FLUID LEVEL (DAILY)

Place the carrier and packer plates in the "interrupted cycle" position and fully retract pushout cylinder to check fluid level. When checking fluid level in hydraulic tank, also note any frequent or sudden loss of fluid. This would indicate leakage, which must be traced and corrected to avert equipment failure and possible damage to components.

If low, fill hydraulic tank to the "NORMAL FILL LEVEL" with hydraulic fluid as specified in Sec. 4 SPECIFICATIONS according to operating and weather conditions.

### CLEAN TANK BREATHER (WEEKLY)

Clean the air breather (1) every week. Replace a breather that can not be cleaned adequately.

### LUBRICATION POINTS (WEEKLY)

Every week (every 40 hours of operation) lubricate the unit as shown on the LUBRICATION CHART in this section.

### CHECK/REPLACE RETURN LINE FILTER ELEMENT

The return line filter is a vital component of the hydraulic system. Without proper filtration problems are bound to occur among the hydraulic system components. Stick to a strict maintenance schedule for this item.

#### Time Lapse Recommendations for Element Replacement

1. After the first 20-hours of hydraulic pump operation.
2. After the next 50-hours of hydraulic pump operation.
3. Thereafter, every 250-hours of hydraulic pump operation or sooner, if so indicated by the filter replacement indicator.

The condition of the filter element must be checked weekly by looking at the visual indicator on the filter.

### REPLACEMENT OF FILTER ELEMENT (See Hydraulic System Service illustration)

1. Remove filter cover (3) and o-ring (4).
2. Remove diverter housing (5) and o-ring (6).
3. Remove element (7) and discard.
4. Install a new element.
5. Coat new o-ring (6) with fresh hydraulic fluid and install in diverter housing (5). Place housing in bowl (8).
6. Coat new o-ring (4) with fresh hydraulic fluid and install in filter cover (3).
7. Install cover and secure to bowl with attaching hardware.
8. Check fluid level and replenish with fresh fluid as described earlier in this section under CHECKING FLUID LEVEL.

### CAUTION

Extended operation of unit without proper filtration will result in reduced service life of hydraulic system components.

### CLEANING HYDRAULIC STRAINER (MONTHLY)

1. Remove cover (9) and o-ring (10).
2. Unscrew strainer (11).
3. Clean strainer thoroughly in a suitable cleaning solvent.
4. Reinstall strainer.
5. Inspect the o-ring (10) and replace with a new one if necessary.
6. Install the o-ring carefully and secure cover to strainer housing with attaching hardware.

### FLUSHING HYDRAULIC SYSTEM (YEARLY)

1. Drain all fluid from hydraulic tank into a suitable container by removing drain plug (12).
2. Wipe off the magnetic ring, (13) and wipe out the bottom of the tank.
3. Clean strainer as described above.
4. Fill the hydraulic tank with fresh fluid as specified in Sec. 5, SPECIFICATIONS according to operating and weather conditions.
5. Start truck and operate all hydraulic levers as described in Sec. 3, OPERATION. Leave all hydraulic cylinders in the retracted position and shutdown unit.
6. Recheck fluid level and add fluid as necessary to bring level to the "NORMAL FILL LEVEL" on the sight gauge.

#### NOTE

Refer to Sec. 9, SERVICE & REPAIR for detailed instructions pertaining to those items requiring repair or replacement.



## PREVENTIVE MAINTENANCE

### WEEKLY PREVENTIVE MAINTENANCE

#### 1. CLEANING.

Clean and paint exposed metal surfaces to remove and prevent the formation of rust.

#### 2. INSPECTION.

- In addition to the body mounting hardware, which is checked daily, inspect all other accessible mounting hardware and fittings for tightness. Refer to the CAPSCREW MARKING AND TORQUE VALUE CHART provided in Sec. 4, GENERAL REPAIR PRACTICES.
- Check electrical wiring and insulation for frays, breaks and loose connections.

#### 3. LUBRICATION.

Refer to the LUBRICATION CHART in this section and service those items which require weekly lubrication.

#### 4. HYDRAULIC SYSTEM.

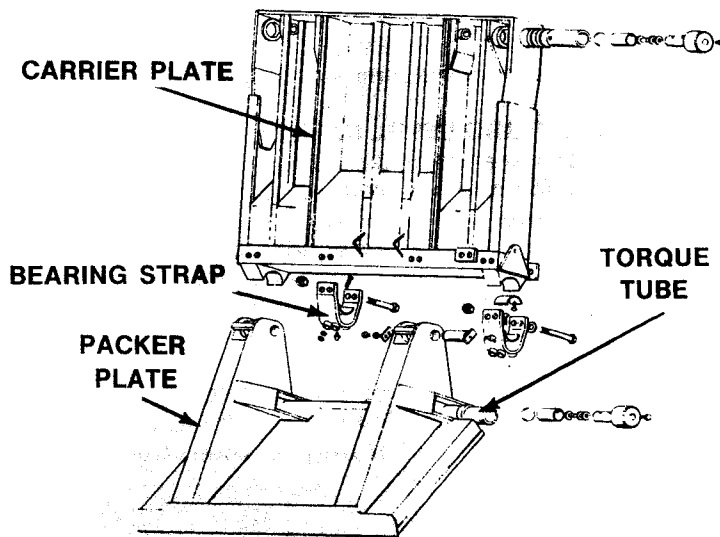
- The return line filter element is vital to the service life of the hydraulic system. Check the replacement indicator on the filter assembly weekly. Refer to HYDRAULIC SYSTEM SERVICE later in this section for more detailed information about this important item.
- Check the breather cap on the hydraulic tank. Clean it weekly and replace it if it can not be cleaned thoroughly or is missing.

#### NOTE

*A leaking breather on the clamp cylinder indicates a defective piston cup which must be replaced as described in Sec. 9,*

#### 5. CHECK-OUT PROCEDURES.

Each week perform the CHECK-OUT PROCEDURES listed in Sec. 7 of this manual.



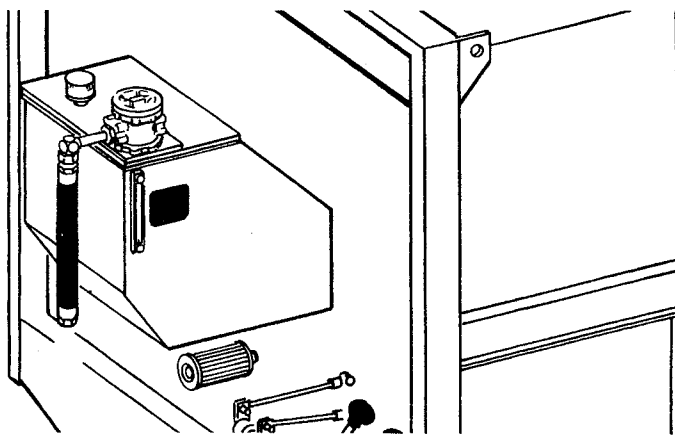
### MAINTENANCE RECOMMENDATIONS

The packer/carrier assembly should be visually inspected every forty (40) hours of operation for cracked or fatigued welds, loose or broken fasteners, worn bearings, pin hubs or pins. The four (4) torque tube bearing straps should be lubricated a minimum of every forty (40) hours of operation.

### MONTHLY PREVENTIVE MAINTENANCE

#### HYDRAULIC SYSTEM

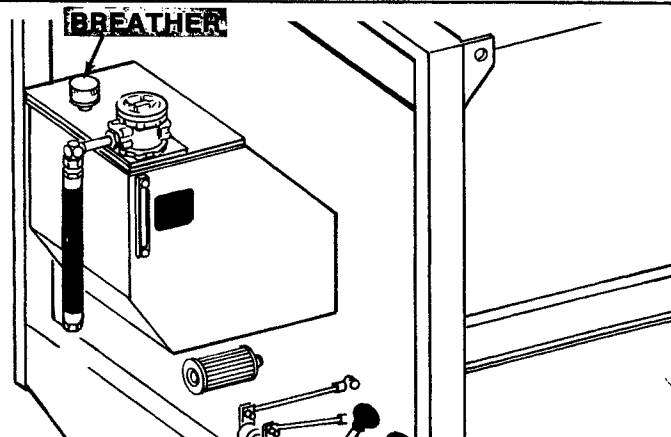
- Once a month, remove and clean the hydraulic tank fluid strainer as described in HYDRAULIC SYSTEM SERVICE in this section.
- Each month check the tailgate lift cylinder air breather, if plugged, replace it with a new breather.



### YEARLY PREVENTIVE MAINTENANCE

#### HYDRAULIC SYSTEM

- Once a year drain, flush and refill the hydraulic tank as described under HYDRAULIC SYSTEM SERVICE in this section.
- Once a year replace the Hydraulic Tank air breather.
- Once a year replace the fibrous tailgate lift cylinders air breathers.



**HYDRAULIC SYSTEM SERVICE**

(See accompanying hydraulic system illustration)

**CONTAMINATION**

It is estimated that as much as 90% of all hydraulic problems may be traced directly to the fluid. It is of utmost importance that all foreign matter be kept from the hydraulic fluid. Invisible quantities of abrasive type contamination may cause serious pump wear, malfunctioning of pumps and valves, and sludge accumulations within the system in relatively short periods of time. It is also essential that moisture and water be kept from the hydraulic fluids and system.

**COMMERCIAL HYDRAULIC FLUID TESTING**

Hydraulic fluid samples should be taken periodically for laboratory analysis. The actual sampling method is critical. It should be done based on ANSI Standard B93.19M(R1980). This standard is available from the National Fluid Power Association, 3333 N. Mayfair Rd., Milwaukee, WI 53222.

Samples should be taken from the center of the reservoir when the fluid is at operating temperature and placed in a clean, dry, glass bottle with a non-shedding, screw-on cap. The bottle should be labeled with the date, type of fluid, and model and serial number of the machine.

Two identical samples should be taken. One for laboratory analysis and one for your own preliminary analysis while you are waiting for the lab report.

We recommend the use of commercial laboratory services for analysis of routine oil samples taken on a regularly scheduled basis. The cost is about \$20 to \$30 per sample. The most important analyses are particle count, Spectro-chemical analysis, water content, and viscosity.

**IN HOUSE HYDRAULIC FLUID TESTING**

After your sample has been allowed to stand for 20 to 30 minutes to eliminate all air bubbles, hold the bottle up to the light to check for debris in the oil and for whether the oil is clear or cloudy.

Any visible debris is an indication of a severe solid contamination problem, the source of which must be located and corrected immediately. Common sources of this kind of contamination may be component wear, unsealed reservoir covers, or dirty air breather filters.

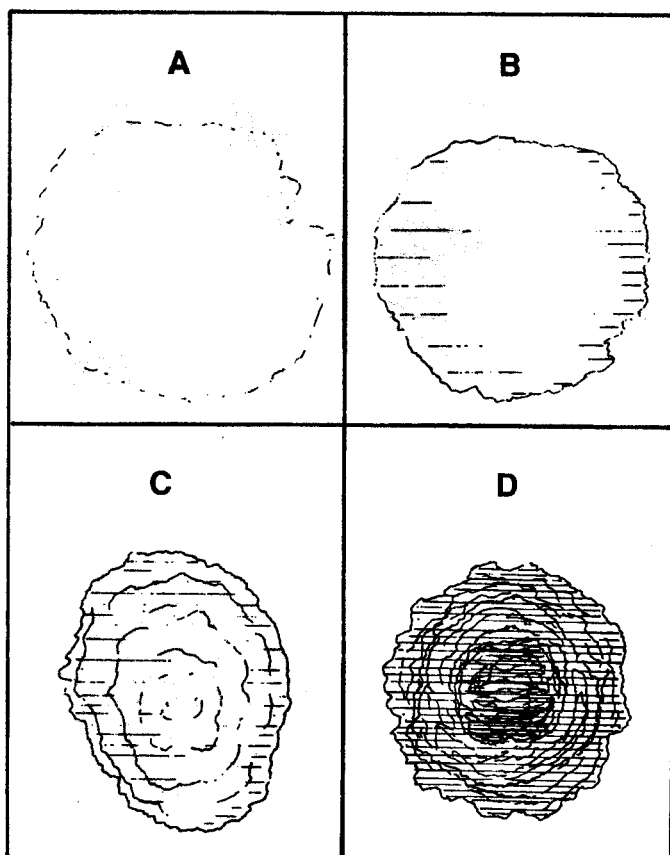
If the sample is the least bit "cloudy" it is an indication of water contamination, the source of which must be found and eliminated immediately. Common sources are inadequate outdoor storage, unsealed reservoir covers, or condensation.

A "BLOTTER SPOT TEST" may also be performed to test for OXIDATION. Place a DROP of oil on a piece of white blotter paper. Order Leach part number 102480 for 20 sheets.

**NOTE:**

*The Blotter Test will provide an indication that a more complete test may be necessary.*

- If the blotter remains colorless or develops only a light yellow ring, oxidation is under control.
- If color develops but is uniform throughout, the oil is still serviceable but should be checked for correct additive content.
- If the sample shows distinct rings the fluid should be changed.
- If a distinct dark spot remains in the middle, but a lighter colored oil migrates outward in the blotter paper the oil is about to dump (or already has) sludge or other by-products into the system. The time for replacement of this fluid has already passed.



Kits are available from your fluid supplier to test for acid content in much the same way you would test the condition of swimming pool water. A shift in acid content may indicate a breakdown in the fluid.

**KEEP ACCURATE, DATED RECORDS OF ALL PERTINENT INFORMATION GAINED FROM THESE TESTS.**



**GENERAL**

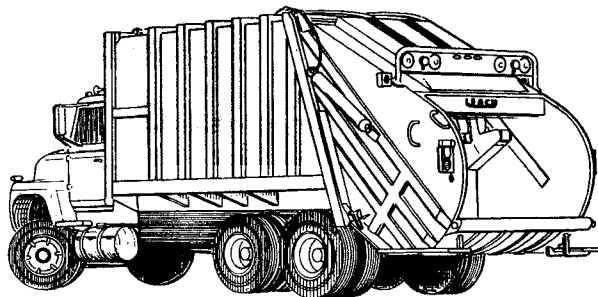
The 2R11 Packmaster has been designed to provide long periods of trouble-free operation. Performing the check-out procedures below, at regular weekly intervals, will help to prevent unscheduled downtime.

**▲WARNING**

Make sure you know and observe all safety precautions listed in Sec. 2 before performing any of the following check-out procedures. Use extreme caution to avoid coming near any moving parts. Never enter the body of the unit when the truck is running. Make sure the unit is in the correct operational mode as indicated by the OPERATIONAL STATUS block presented at the beginning of each check.

**NOTE**

*Because of the location of some controls, some checks will require two people.*



**▲CAUTION**

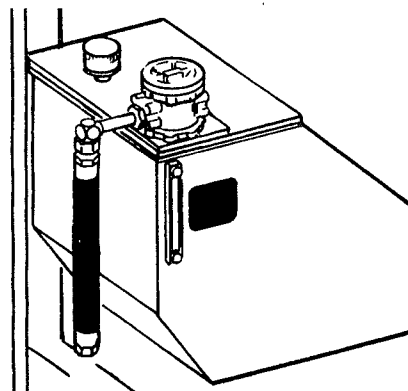
If the unit being worked on has an optional system such as telescopic pushout circuit, it is important to refer to Section 10, for specific instructions concerning those items. For example, when performing the check-out procedures listed in Section 7, refer to Section 10 to see what different or additional procedures must be followed for an optional item.

**CHECK HYDRAULIC TANK FLUID LEVEL**

1. Make sure tailgate is down and clamped securely.
2. Position packer plate to "INTERRUPTED CYCLE" position.
3. Pull pushout lever to position cylinder in the retract position.
4. Fluid level should be between the safe range marks on sight gauge.

**IF NOT:**

5. Add hydraulic fluid for normal operating and weather conditions. See Sec. 6, PREVENTIVE MAINTENANCE for additional information about servicing the hydraulic tank.

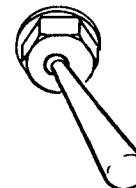


**CHECK ENGINE SOLENOID SWITCH**

1. Start engine.
2. Turn solenoid switch ON.

**IF ENGINE SPEEDS UP:**

the system is grounded. Shut off engine and remove keys. Locate short and repair as described under ELECTRICAL SYSTEM in Sec. 9, SERVICE AND REPAIR.



# SECTION 7

## CHECK-OUT

### CHECK ENGINE SPEED-UP SWITCHES

#### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
-------	---------	-----	---------	----------	----

1. Depress engine speed-up pushbutton. Engine should speed up.

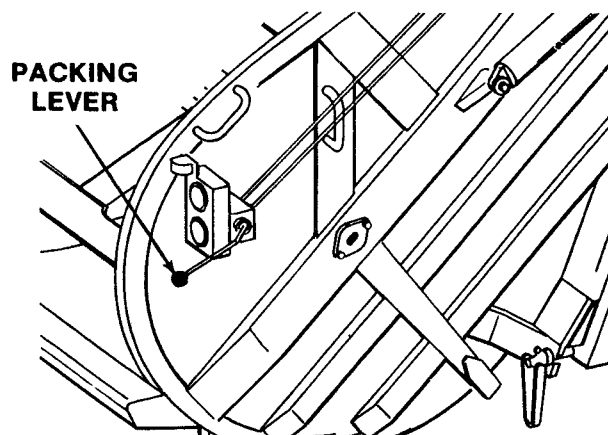
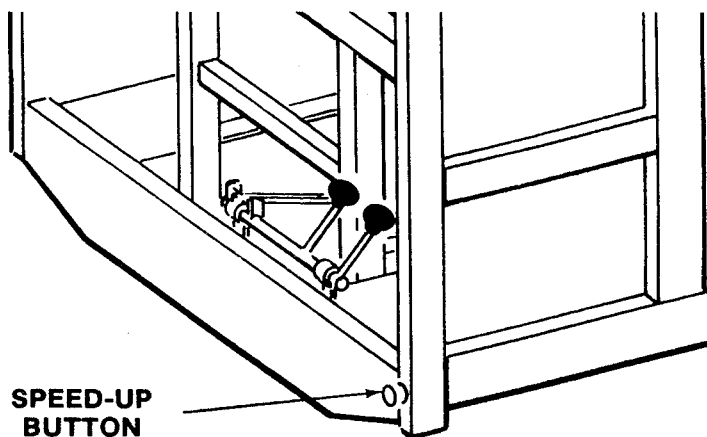
#### IF NOT:

locate fault in wiring or switch and repair. See Sec. 9, SERVICE AND REPAIR — ELECTRICAL SYSTEM.

2. Activate packing lever. Engine should speed up.

#### IF NOT:

locate fault in wiring or switch and repair. See Sec. 9, SERVICE AND REPAIR — ELECTRICAL SYSTEM.



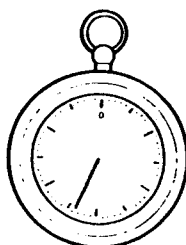
### CHECK PACKING CYCLE TIME

#### Operational Status

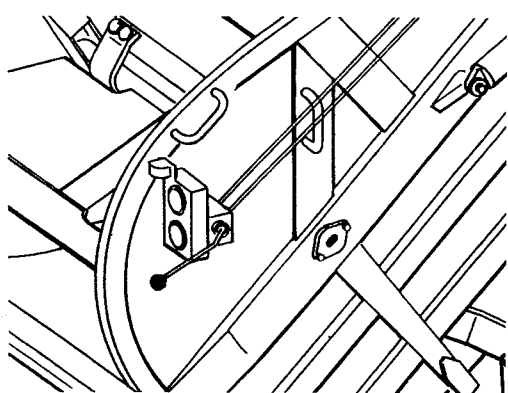
Truck	Running	PTO	Engaged	Sol. Sw.	On
-------	---------	-----	---------	----------	----

1. Activate packing lever and using a stopwatch, time complete cycle. A complete cycle should take 32 seconds.

#### IF NOT:



32 SECONDS



LENGTHEN FOR LONGER CYCLE

SOLENOID

CARBURETOR

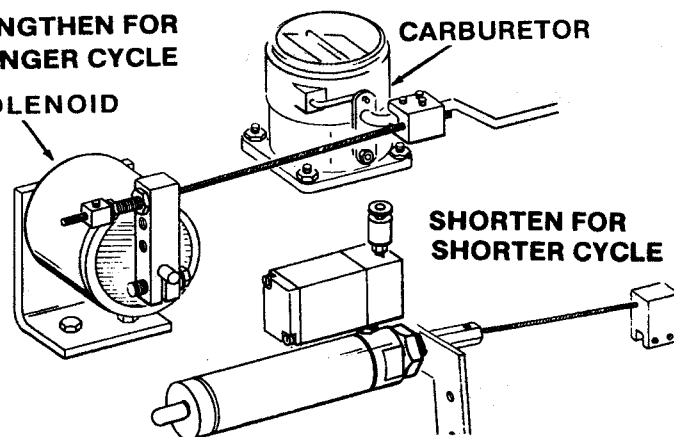
SHORTEN FOR SHORTER CYCLE

Operational Status			
Truck	Off	Keys	Removed

2. Adjust cable length between solenoid and carburetor as needed to obtain correct cycle time.

#### NOTE

*It is important that the cycle time is correct for the following pressure checks.*



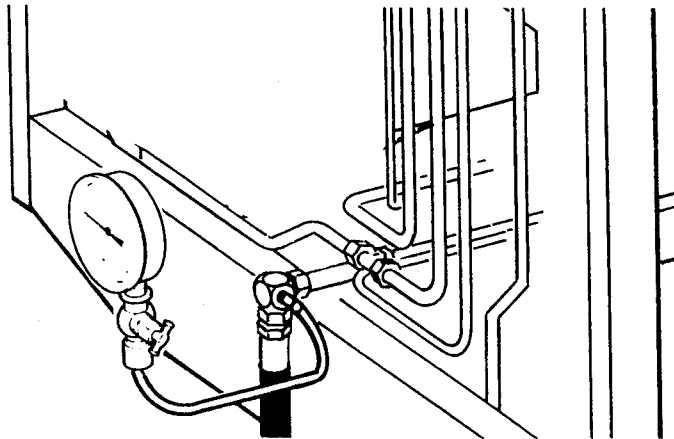


**CHECK PRESSURES**

The pressure checks provided below will indicate the operating condition of the hydraulic system. Detailed adjustment procedures are provided later in this section and are referenced at the appropriate check-out procedure. Prior to performing pressure checks:

Operational Status			
Truck	Off	Keys	Removed

1. Install a 0-2000 PSI gauge as shown.
2. Start truck, engage PTO and turn solenoid switch ON.
3. Perform the following checks in order.



**CHECK MAIN LINE PRESSURE**

Operational Status				
Truck	Running	PTO	Engaged	Sol. Sw. On

1. Depress speed-up button.
2. Move push-out control lever to fully extend push-out cylinder
3. Hold lever and read gauge. Pressure should be 1650 PSI.

**NOTE**

On units with the telescopic pushout option the maximum pressure should be 700 PSI, see Section 10.

**IF NOT:**

Operational Status				
Truck	Running	PTO	Engaged	Sol. Sw. On

4. Release tailgate clamps and raise tailgate to upmost position.
5. Hold tailgate lift lever and read gauge. Pressure should be 1650 PSI.

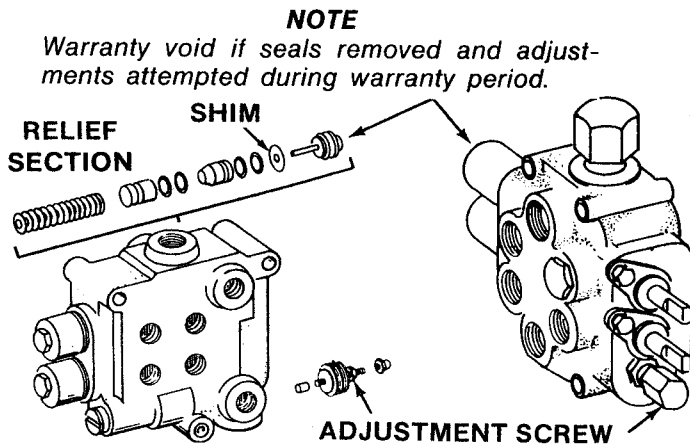
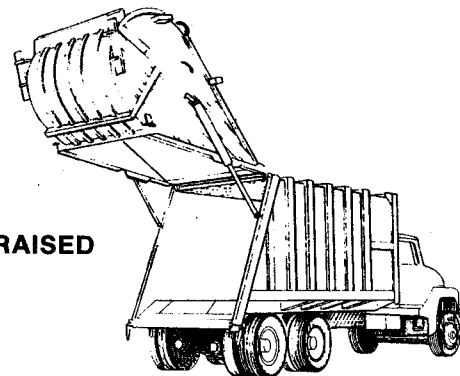
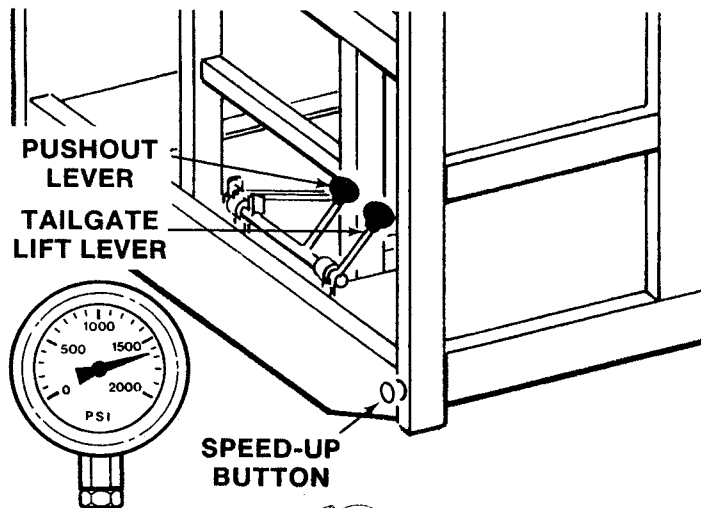
**IF NOT:**

Operational Status			
Truck	Off	Keys	Removed

6. If pressure is at least 1400 PSI increase pressure by adjusting the relief section of 2-SPOOL DIRECTIONAL VALVE as described in Sec. 9, SERVICE AND REPAIR. Start truck, repeat steps 4 and 5 and check gauge for 1650 PSI.

**IF NOT:**

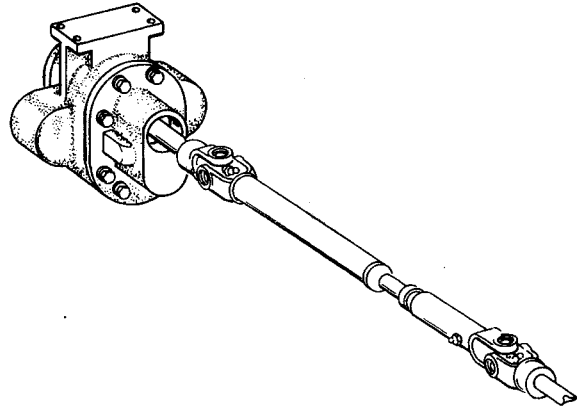
7. Perform TEST FOR LEAKING TAILGATE CYLINDER CUPS as described in Sec. 9, SERVICE AND REPAIR. Start truck, repeat steps 5 and 6 above and again check gauge for 1650 PSI.



## CHECK-OUT

IF NOT:

- Replace defective HYDRAULIC PUMP as described in Sec. 9, SERVICE AND REPAIR.



### CHECK REVERSING PRESSURE

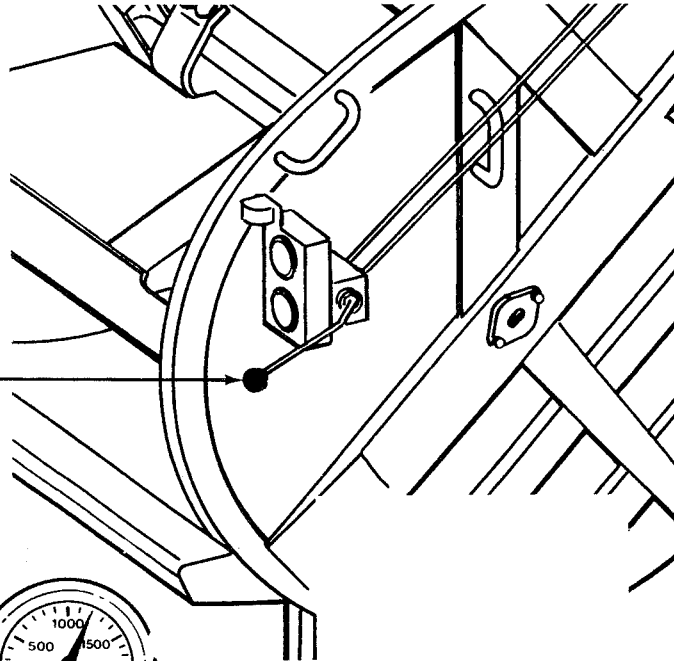
#### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	ON
-------	---------	-----	---------	----------	----

- Shift packing lever and cycle unit.
- Read gauge as main operating valve (packer plate) reverses. Pressure should be 1200 PSI.

IF NOT:

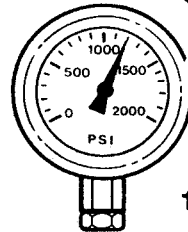
**PACKING LEVER**



#### Operational Status

Truck	Off	Keys	Removed
-------	-----	------	---------

- Check reversing spring in main operating valve as described in the MAIN OPERATING VALVE Section 8, Troubleshooting.



**1200 PSI**

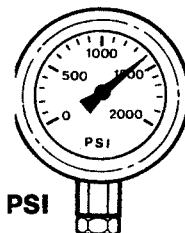
**PACKING LEVER**

### CHECK KNOCKOUT PRESSURE

#### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	ON
-------	---------	-----	---------	----------	----

- Shift packing lever and cycle unit.
- Read gauge as pressure peaks just before cycle stops. Pressure should be 1400 PSI.



**1400 PSI**

IF NOT:

Operational Status			
Truck	Off	Keys	Removed

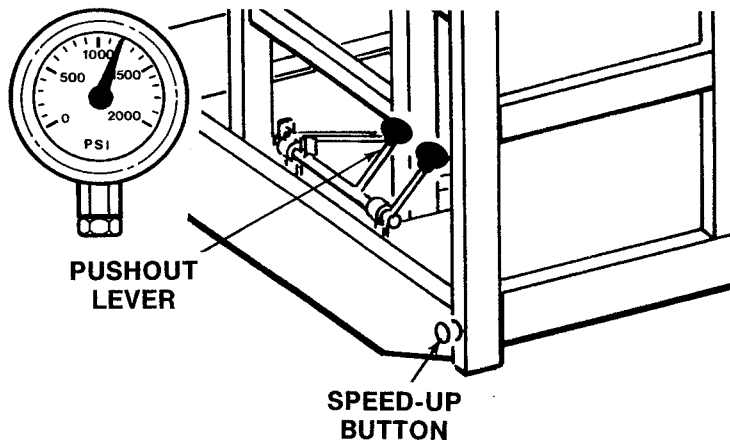
3. Check knock out spring operation **as described** in the MAIN OPERATING VALVE Section 8, Troubleshooting.

**CHECK SEQUENCE VALVE PRESSURE**

Operational Status					
Truck	Running	PTO	Engaged	Sol. Sw.	ON

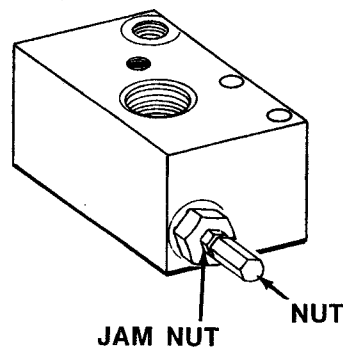
1. Depress speed-up button.
2. Move pushout control lever to extend pushout cylinder.
3. Read gauge just as pushout cylinder begins extending. Pressure should be 1200 PSI.

**IF NOT:**



Operational Status			
Truck	Off	Keys	Removed

4. Correct pressure by:
  - a. Removing nut.
  - b. Loosening jam nut.
  - c. Adjusting setscrew in to increase pressure or out to decrease pressure.
5. Repeat steps 1 thru 4 until pressure is correct.

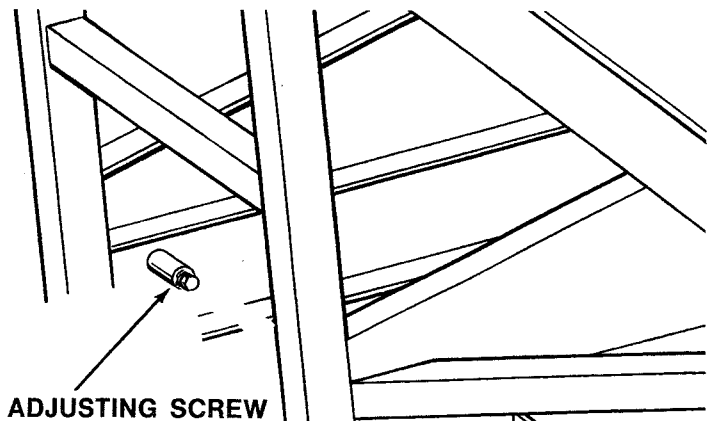


**CHECK FRICTION BRAKE**

1. The body must be empty before checking friction brake.
2. The pushout plate should not move freely on its own when stopping or starting the truck. It should be held in position by the friction brake.

**IF NOT:**

3. Turn in adjusting screw until the pushout plate does not move when starting or stopping the truck. The friction brake can be turned in until a socket will no longer grasp the screw head. In which case shims or a new block must be installed as described in Sec. 9, SERVICE AND REPAIR under PUSHOUT PLATE.



# SECTION 7

## CHECK-OUT

### CHECK CLAMP MECHANISM

#### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	ON
-------	---------	-----	---------	----------	----

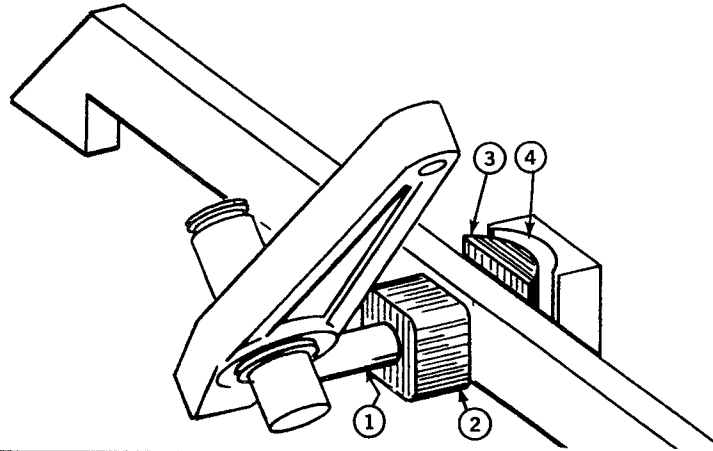
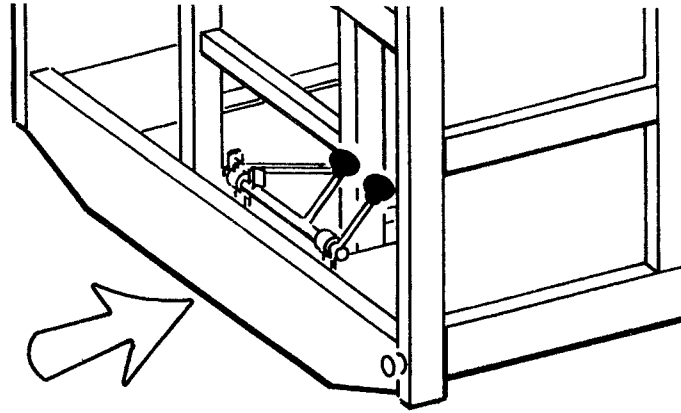
1. With the unit partially loaded push the pushout control lever rearward and hold.
2. Observe the clamp action, the pushout bar should not slip through the clamp mechanism.

#### IF NOT:

3. If slippage is occurring check for wear on the items shown.

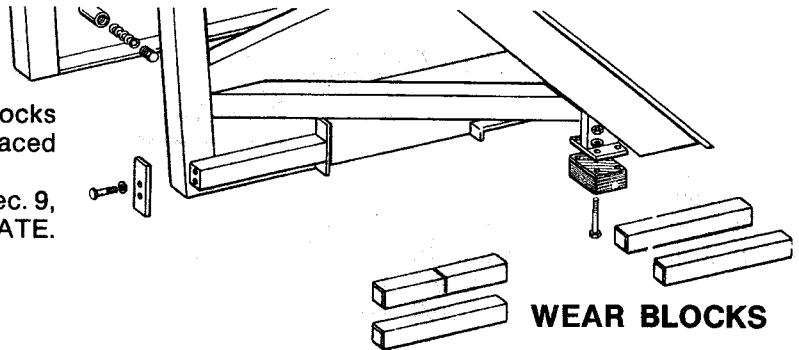
- Rocker Clamp Pin (1)
- Clamp Block (2)
- Clamp Shoe (3)
- Clamp Shoe Socket (4)

Parts wear, if not excessive, can be compensated for by adding shims (available from your LEACH distributor). See Sec. 9, SERVICE AND REPAIR, Clamp Mechanism.



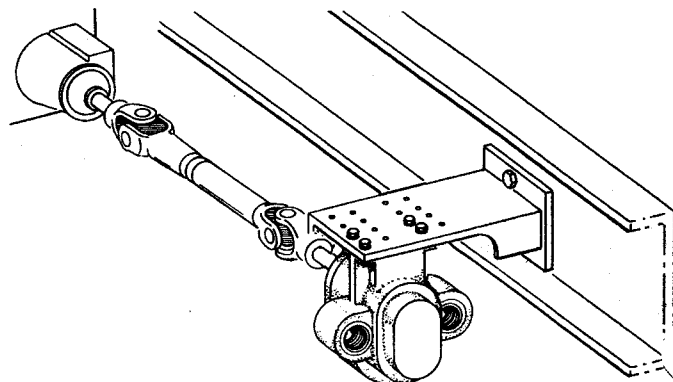
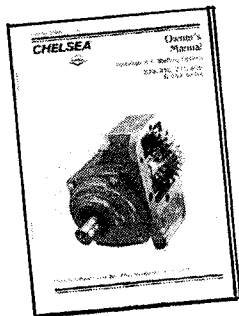
### CHECK PUSHOUT SHOES AND WEAR BLOCKS

1. Visually inspect all pushout shoes and wear blocks for excessive wear. These items **must** be replaced before there is metal to metal contact.
2. Shim or replace worn parts as described in Sec. 9, SERVICE AND REPAIR under PUSHOUT PLATE.



### POWER TAKE OFF (P.T.O.)

1. Periodically re-torque the mounting bolts or studs as outlined in the P.T.O. manufacturers service manual.



## GENERAL

Troubleshooting is a matter of quickly and logically isolating the cause of a problem and taking corrective action. Factory trained mechanics, experienced operators, a thorough understanding of the information in this manual and accurate maintenance records are the best troubleshooting tools available. Occasionally it may be best for a service person, who is trying to isolate a problem, to go "on the route" or consult with operators to determine how the unit is acting under actual working conditions.

For the most part, problems with the unit will be limited to hydraulic and electrical system component

malfunction or control linkage adjustment.

Hydraulic flow diagrams are provided in Sec. 1, INTRODUCTION. These diagrams can be helpful in determining which parts are associated with a particular function. For example, the clamp cylinder is part of the load pushout function.

An electrical wiring diagram is included in Sec. 9, SERVICE AND REPAIR under ELECTRICAL SYSTEM.

Problems in the hydraulic system may be found by performing the PRESSURE CHECKS found in Sec. 7, CHECK-OUT PROCEDURES. Refer to Section 10 for telescopic troubleshooting.

## COMPACTION

Before troubleshooting a unit it is important to remember that the compaction may vary with the following conditions.

1. Type of refuse. Tree branches, dry leaves, furniture, and any other items loaded into the body that take up relatively large amounts of space will reduce the compaction ratio.
2. Moisture content of refuse. Wet refuse will pack tighter than dry and consequently a wet load will weigh more than a dry load. Wet refuse loaded into the body will increase the compaction rate.
3. Operation of the equipment. As with the operation of any type of heavy equipment, one machine can yield different results with different operators. Operating a rear loader is a skill. Placement of items in the hopper, not over loading the hopper, and releasing the pushout plate clamp at the right time are all learned skills that will affect the compaction rate of a unit.

4. Preventative maintenance. A properly maintained unit will achieve higher compaction rates than one that is poorly maintained. The condition of the hydraulic system, pump, main relief setting, and the condition of the operating cylinder seals will all have an effect on unit performance and compaction. Some chassis components will also affect compaction. The engine speed during packing, fluid level in an automatic transmission, and the condition of the clutch assembly in a standard transmission chassis may also affect compaction.

Compaction rates of a unit will depend on the season, the type of trash, the weather, and the operation and maintenance of a unit. If the unit packs relatively consistent loads and has been properly maintained according to the Service manual then it is safe to assume that it is getting maximum compaction for your particular conditions.



**TROUBLESHOOTING****DIESELING IN HYDRAULIC SYSTEMS**

Any hydraulic system should be a sealed environment free of foreign material including air. Unlike solid contamination, air is compressible and contains oxygen. It is these two (2) properties of air contamination that provide the elements needed to support the phenomenon known as dieseling. Dieseling can only occur when the elements of fuel, oxygen, and heat are all present at the same time. In the hydraulic system the hydraulic fluid is the fuel. The presence of air provides not only the oxygen to support combustion but also the means for generating sufficient heat to ignite the fuel/air mixture. When air is rapidly compressed, heat is generated. A rapid pressure change of only 600 psi may be enough to generate the heat required to ignite the fluid and air mixture. The oxygen in the heated compressed air and the hydraulic fluid ignite resulting in dieseling. The ignitions that result from dieseling in the hydraulic system are small in size and many may be needed to eventually damage a piston seal to the extent that bypass will occur.

"Where does the air come from?" The answer is that the air comes out of the fluid itself. Hydraulic fluid can contain 10% air by volume. As the pressure on the fluid increases, the amount of air that can be absorbed also increases.

Now we know that the air is most likely present in the fluid but the next question is "How does the air get out of the fluid?" The air, while it is in suspension, will pose no problem to the operation of the hydraulic system. But once it is separated into bubbles then all the factors are present to support combustion. The air in suspension can be separated when the fluid is subjected to a negative pressure (vacuum) of as little as 3.5 psi. This can occur when the fluid is squeezed through a restriction or an orifice. The resulting pressure decrease can be sufficient to allow trapped air to separate from the fluid.

A good example may be a front mounted pump dry valve system. In the dry mode of operation, system hydraulic fluid is drawn through a small orifice. This provides lubrication and cooling for the pump but also provides a perfect situation for air separation. In addition, the flow regulator bypass at the pump output is returned back to the pump input, this recirculates the fluid/air and allows for the separation of even more air.

In cases where the seals in 2Rll packer cylinders appear to be burnt or melted consider the possibility of air ingestion. The following suggestions may help in eliminating this problem:

1. Insure that the pump suction connections are tight. It is possible for a suction hose connection to allow air in without leaking any fluid out.
2. The pump shaft seal can allow air into the system. Replace the seal if suspect.
3. Check for air ingestion around the packings on the gate valve stem. Tighten the packing nut if suspect.
4. Excessive system flow rate (cycle time too fast) can agitate the hydraulic fluid. Set the cycle time according to specifications.
5. Do not thin hydraulic fluid with diesel fuel (lowers the flash point). Weather permitting, use a higher flash point fluid.

After making any repairs on the hydraulic system bleed the system at reduced engine speed and pressure to remove any trapped air. Depending on the size of the component i.e. cylinder, hose, it may be necessary to cycle the unit several times. Of course the larger the air pocket the more cycles are needed. To avoid potential problems thoroughly bleed all hydraulic systems and insure that all inlet connections are tight and not ingesting air.

POSSIBLE CAUSE	REMEDY
<p><b>OPERATION IS ERRATIC</b></p> <ol style="list-style-type: none"> <li>1. SOLENOID RECEIVING ERRATIC ELECTRICAL CURRENT.</li> <li>2. SOLENOID FLEXING AT MOUNTING POINT.</li> <li>3. ENGINE MOTOR MOUNTS DEFECTIVE.</li> <li>4. HYDRAULIC FLUID TOO HOT.</li> <li>5. HYDRAULIC FLUID LEVEL TOO LOW.</li> <li>6. BYPASS IN CYLINDERS.</li> <li>7. HYDRAULIC FLUID TOO COLD.</li> <li>8. OPERATING LINKAGE BENT OR BINDING.</li> <li>9. SPOOLS OR PACKING IN DIRECTIONAL VALVE BENT OR BINDING.</li> <li>10. VALVE PACKINGS LEAKING OR TOO TIGHT IN MAIN OPERATING VALVE.</li> </ol>	<ol style="list-style-type: none"> <li>1. CHECK ELECTRICAL SYSTEM. SEE SEC. 9, SERVICE AND REPAIR</li> <li>2. MAKE SURE SOLENOID IS MOUNTED FIRMLY AND MOUNTING DOES NOT FLEX.</li> <li>3. REPAIR OR REPLACE AS REQUIRED.</li> <li>4. CHECK FOR PROPER GRADE OF FLUID. SEE SEC. 6, PREVENTIVE MAINTENANCE.</li> <li>5. CHECK FLUID LEVEL. ADD FLUID IF NECESSARY.</li> <li>6. TEST FOR LEAKING CYLINDERS. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>7a. BRING FLUID TO OPERATING TEMPERATURE.</li> <li>7b. CHECK FOR PROPER GRADE OF HYDRAULIC FLUID, SEE SEC. 4, SPECIFICATIONS.</li> <li>8. REPAIR, REPLACE OR REALIGN DAMAGED LINKAGE.</li> <li>9. REPAIR, REPLACE OR REALIGN. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>10. REPAIR VALVE.</li> </ol>
<p><b>PUMP NOISE IS EXCESSIVE</b></p> <p><b>NOTE</b> ALL PUMPS MAKE A CERTAIN AMOUNT OF NOISE.</p> <ol style="list-style-type: none"> <li>1. PUMP STARVING FOR FLUID.</li> <li>2. HYDRAULIC FLUID TOO COLD.</li> <li>3. PTO DRIVE SHAFT AND/OR U-JOINTS BADLY WORN OR OUT OF BALANCE.</li> <li>4. PUMP GEARS, END PLATES, BEARINGS, ETC., BADLY WORN.</li> <li>5. IMPROPER GRADE OF HYDRAULIC FLUID (FLUID FOAMING).</li> <li>6. AIR ENTERING THE SYSTEM.</li> </ol>	<ol style="list-style-type: none"> <li>1. OPEN GATE VALVE.</li> <li>1a. CHECK FLUID LEVEL.</li> <li>1b. CHECK HYDRAULIC FLUID FILTER AND TANK. SEE SEC. 6, PREVENTIVE MAINTENANCE.</li> <li>1c. CHECK FOR OBSTRUCTION IN SUCTION LINES, HOSES KINKED OR COLLAPSED.</li> <li>2a. BRING FLUID TO NORMAL OPERATING TEMPERATURE.</li> <li>2b. CHANGE HYDRAULIC FLUID TO PROPER GRADE FOR OPERATING CONDITIONS, SEE SEC. 5, SPECIFICATIONS.</li> <li>3. REPAIR, REPLACE AND/OR BALANCE ALL PARTS.</li> <li>4. REPLACE PUMP.</li> <li>5. REPLACE WITH PROPER GRADE OF HYDRAULIC FLUID. SEE SEC. 5, SPECIFICATIONS.</li> <li>6a. TIGHTEN SUCTION HOSE.</li> <li>6b. TIGHTER PACKING ON THE GATE VALVE STEM.</li> <li>6c. REPLACE THE PUMP SHAFT SEAL.</li> <li>6d. REPLACE THE SUCTION HOSE.</li> <li>6e. REPLACE THE O-RINGS ON THE PUMP.</li> </ol>



**TROUBLESHOOTING**

POSSIBLE CAUSE	REMEDY
<p><b>ENGINE WILL NOT SPEED UP WHEN PACKING LEVER OR SPEED-UP BUTTON IS ENGAGED</b></p> <ol style="list-style-type: none"> <li>1. SHORT IN ELECTRICAL WIRING.</li> <li>2. BLOWN FUSE ON SPEED-UP RELAY.</li> <li>3. RELAY, SOLENOID, OR SWITCH ARE DEFECTIVE.</li> <li>4. SOLENOID-TO-CARBURETOR OR GOVERNOR CABLE IS BROKEN.</li> <li>5. ELECTRICAL SYSTEM NOT GROUNDED PROPERLY.</li> <li>6. PACKING LEVER SPEED-UP SWITCH OR LINKAGE DEFECTIVE.</li> <li>7. SOLENOID MOUNTING LOOSE, BROKEN OR INCORRECT.</li> <li>8. TRUCK ENGINE MOUNTS LOOSE, WORN, BROKEN OR MISSING.</li> </ol>	<ol style="list-style-type: none"> <li>1. REPAIR BROKEN WIRE. SEE ELECTRICAL SYSTEM IN SEC. 9, SERVICE AND REPAIR.</li> <li>2. REPLACE FUSE AND CHECK ELECTRICAL SYSTEM FOR SHORTS. SEE ELECTRICAL SYSTEM SEC. 9, SERVICE AND REPAIR.</li> <li>3. CHECK FOR AND REPLACE DEFECTIVE PARTS AS DESCRIBED IN THE ELECTRICAL SYSTEM SECTION. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>4. REPLACE CABLE.</li> <li>5. CHECK ALL GROUND CONNECTIONS FOR CORROSION OR BREAKS. CLEAN OR REPAIR AS DESCRIBED IN THE ELECTRICAL SYSTEM SECTION. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>6. REPAIR, REPLACE OR ADJUST AS REQUIRED.</li> <li>7. BE SURE SOLENOID MOUNTING IS CORRECT AND SECURE.</li> <li>8. REPAIR OR REPLACE ENGINE MOUNTS AS REQUIRED.</li> </ol>
<p><b>ENGINE SPEED WILL NOT RETURN TO NORMAL WHEN PACKING CYCLE IS COMPLETED OR SPEED-UP BUTTON IS RELEASED</b></p> <ol style="list-style-type: none"> <li>1. SHORT CIRCUIT IN ELECTRICAL SYSTEM.</li> <li>2. PACKING LEVER SPEED-UP SWITCH IS DEFECTIVE.</li> <li>3. SOLENOID MOUNTING LOOSE, BROKEN OR INCORRECT.</li> <li>4. TRUCK ENGINE MOUNTS LOOSE, WORN, BROKEN OR MISSING.</li> </ol>	<ol style="list-style-type: none"> <li>1. CHECK FOR AND REPAIR SHORT IN SYSTEM DESCRIBED IN ELECTRICAL SECTION. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>2. REPAIR, REPLACE OR ADJUST AS REQUIRED.</li> <li>3. BE SURE SOLENOID MOUNTING IS CORRECT AND SECURE.</li> <li>4. REPAIR OR REPLACE ENGINE MOUNTS AS REQUIRED.</li> </ol>
<p><b>MAIN OPERATING VALVE SHIFTS (REVERSES) TOO SOON</b></p> <ol style="list-style-type: none"> <li>1. OBJECT IN HOPPER THAT PACKER PLATE CAN NOT PENETRATE.</li> <li>2. CYCLE TIME TOO FAST.</li> <li>3. REVERSING PRESSURE TOO LOW.</li> <li>4. BROKEN REVERSING SPRING.</li> <li>5. LOOSE SCREW IN SPOOL OF DIRECTIONAL VALVE FOR PACKER PLATE CYLINDERS.</li> </ol>	<ol style="list-style-type: none"> <li>1. RECYCLE UNIT. REARRANGE OR REMOVE REFUSE IF NECESSARY.</li> <li>2. ADJUST SOLENOID-CARBURETOR CABLE LENGTH.</li> <li>3. PERFORM PRESSURE CHECKS AS DESCRIBED IN SEC. 7, CHECK-OUT.</li> <li>4. REPLACE REVERSING SPRING</li> <li>5. TIGHTEN SCREW. SEE SEC. 9, SERVICE AND REPAIR.</li> </ol>
<p><b>MAIN OPERATING VALVE SHIFTS TO NEUTRAL (KNOCKS OUT) TOO SOON</b></p> <ol style="list-style-type: none"> <li>1. WEAK OR BROKEN KNOCKOUT SPRING IN MAIN OPERATING VALVE.</li> <li>2. NOT ENOUGH ROOM BETWEEN END OF KNOCKOUT PLUNGER AND ADJUSTING BOLT ON KNOCKOUT PIVOT IN MAIN OPERATING VALVE.</li> <li>3. KNOCKOUT PRESSURE TOO LOW.</li> </ol>	<ol style="list-style-type: none"> <li>1. REPLACE SPRING.</li> <li>2. ADJUST SPACE AS DESCRIBED IN MAIN OPERATING VALVE LATER IN SECTION 8, TROUBLESHOOTING.</li> <li>3. PERFORM PRESSURE CHECKS AS DESCRIBED IN SEC. 7, CHECK-OUT.</li> </ol>



## TROUBLESHOOTING

POSSIBLE CAUSE	REMEDY
<b>MAIN OPERATING VALVE WILL NOT SHIFT (REVERSE)</b>	
<ol style="list-style-type: none"> <li>1. PACKER PLATE CYLINDER CUPS LEAKING.</li> <li>2. BROKEN ARM SPRING IN MAIN OPERATING VALVE.</li> <li>3. PACKING TOO TIGHT.</li> <li>4. SQUARE BLOCK ON REVERSING PLUNGER IN MAIN OPERATING VALVE NOT ADJUSTED PROPERLY.</li> <li>5. WORN PARTS ON MAIN OPERATING VALVE BRIDGE ASSEMBLY.</li> <li>6. PLUGGED OIL JET ORIFICE IN MAIN OPERATING VALVE.</li> <li>7. MAIN OPERATING VALVE ROLLERS WILL NOT STAY IN DETENT.</li> </ol>	<ol style="list-style-type: none"> <li>1. PERFORM TEST FOR LEAKING CYLINDER CUPS. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>2. REPLACE ARM SPRING. SEE MAIN OPERATING VALVE, SEC. 8, TROUBLESHOOTING.</li> <li>3. ADJUST PACKING. SEE MAIN OPERATING VALVE, SEC. 8, TROUBLESHOOTING.</li> <li>4. ADJUST BLOCK. SEE MAIN OPERATING VALVE SEC. 8, TROUBLESHOOTING.</li> <li>5. REPLACE PARTS.</li> <li>6. CLEAN ORIFICE. SEE MAIN OPERATING VALVE, SEC. 8, TROUBLESHOOTING.</li> <li>7. REPAIR. SEE MAIN OPERATING VALVE, SEC. 8, TROUBLESHOOTING.</li> </ol>
<b>MAIN OPERATING VALVE WILL NOT SHIFT TO NEUTRAL (KNOCKOUT)</b>	
<ol style="list-style-type: none"> <li>1. BROKEN PIVOT ON MAIN OPERATING VALVE.</li> <li>2. PACKING IN MAIN OPERATING VALVE TOO TIGHT.</li> <li>3. BENT LINKAGE ON MAIN OPERATING VALVE.</li> <li>4. CARRIER CYLINDER PACKING IS LEAKING.</li> <li>5. PRESSURE TOO LOW.</li> <li>6. INTERNAL MAIN OPERATING VALVE PASSAGE RESTRICTED.</li> <li>7. CENTER SPOOL IN MAIN OPERATING VALVE JAMMED.</li> <li>8. TOO MANY WASHERS UNDER KNOCKOUT SPRING IN MAIN OPERATING VALVE.</li> </ol>	<ol style="list-style-type: none"> <li>1. REPLACE PIVOT. SEE MAIN OPERATING VALVE, SEC. 8, TROUBLESHOOTING.</li> <li>2. ADJUST PACKING. SEE MAIN OPERATING VALVE, SEC. 8, TROUBLESHOOTING.</li> <li>3. ALIGN OR REPLACE LINKAGE. SEE MAIN OPERATING VALVE, SEC. 8, TROUBLESHOOTING.</li> <li>4. REPLACE PACKING. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>5. PERFORM PRESSURE CHECK. SEE SEC. 7, CHECK-OUT.</li> <li>6. CLEAN VALVE. SEE MAIN OPERATING VALVE, SEC. 8, TROUBLESHOOTING.</li> <li>7. CLEAN VALVE/REPLACE A DEFECTIVE SPOOL. SEE MAIN OPERATING VALVE, SEC. 8, TROUBLESHOOTING.</li> <li>8. REMOVE WASHERS. SEE MAIN OPERATING VALVE, SEC. 8, TROUBLESHOOTING.</li> </ol>
<b>PACKER PLATE DOES NOT DELIVER FULL FORCE TO PACK LOAD INTO BODY</b>	
<ol style="list-style-type: none"> <li>1. HYDRAULIC PRESSURE INCORRECT.</li> <li>2. HYDRAULIC FLUID LEVEL IN TANK IS LOW.</li> <li>3. HYDRAULIC FILTER IS DIRTY (THIS CONDITION WILL STARVE PUMP AND CAUSE NOISE IN SYSTEM).</li> <li>4. WRONG TYPE OF HYDRAULIC FLUID IN SYSTEM.</li> <li>5. MAIN RELIEF SECTION OF 2-SPOOL DIRECTIONAL VALVE HAS WEAK OR DEFECTIVE PART.</li> <li>6. HYDRAULIC PUMP IS DEFECTIVE AND WILL NOT DELIVER FULL PRESSURE.</li> <li>7. OPERATING CYLINDER PISTON CUPS ARE LEAKING.</li> <li>8. SPRING IN MAIN OPERATING VALVE WEAK OR BROKEN.</li> </ol>	<ol style="list-style-type: none"> <li>1. PERFORM CHECKOUT PROCEDURES THROUGH PRESSURE CHECKS. SEE SEC. 7.</li> <li>2. ADD FLUID TO CORRECT LEVEL. SEE SEC. 6, PREVENTIVE MAINTENANCE.</li> <li>3. SERVICE SYSTEM AS DESCRIBED IN SEC. 6, PREVENTIVE MAINTENANCE.</li> <li>4. DRAIN AND REFILL WITH CORRECT TYPE OF HYDRAULIC FLUID. SEE SEC. 6, PREVENTIVE MAINTENANCE.</li> <li>5. REPLACE RELIEF SECTION. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>6. REPLACE PUMP. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>7. PERFORM TEST FOR LEAKING CYLINDER CUPS. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>8. ADJUST BY ADDING SHIMS, OR REPLACE SPRING AS DESCRIBED IN MAIN OPERATING VALVE, SEC. 8, TROUBLESHOOTING.</li> </ol>



## TROUBLESHOOTING

POSSIBLE CAUSE	REMEDY
<p><b>PACKER PLATE DOES NOT DELIVER FULL FORCE TO PACK LOAD INTO BODY</b></p> <p>9. KNOCKOUT PRESSURES ARE TOO LOW.</p> <p>10. AIR IN HYDRAULIC LINES.</p>	<p><b>REMEDY</b></p> <p>9. PERFORM PRESSURE CHECKS. SEE SEC. 7, CHECK-OUT.</p> <p>10. CYCLE PACKER 6 OR 7 TIMES TO BLEED AIR OUT OF SYSTEM.</p>
<p><b>PACKER PLATE DRIFTS OPEN</b></p> <p>1. PACKER PLATE CYLINDER PISTON CUPS LEAKING.</p> <p>2. 3,000 LB. RELIEF VALVE OUT OF ADJUSTMENT OR DEFECTIVE.</p>	<p>1. PERFORM TEST FOR LEAKING PACKER CYLINDER. SEE SEC. 9, SERVICE AND REPAIR.</p> <p>2. PERFORM TEST/ADJUSTMENT FOR RELIEF VALVE. SEE SEC. 9, SERVICE AND REPAIR.</p>
<p><b>PUSHOUT CYLINDER WILL NOT EXTEND TO PUSH OUT LOAD</b></p> <p>1. SEQUENCE VALVE CARTRIDGE IS DEFECTIVE.</p> <p>2. PUSHOUT BAR BENT AND JAMMING AGAINST PUSHOUT PLATE.</p> <p>3. OPERATOR TRYING TO PUSH LOAD OUT AGAINST PILE OF REFUSE, DIRT OR BANK OF HILL.</p> <p>4. LINKAGE TO 2-SPOOL DIRECTIONAL VALVE BROKEN OR BENT.</p> <p>5. LEAKING PISTON CUPS IN PUSHOUT CYLINDER.</p> <p>6. HYDRAULIC TUBING IS DAMAGED (PINCHED SHUT).</p> <p>7. MAIN RELIEF PRESSURE TOO LOW</p>	<p>1. REPLACE CARTRIDGE OR ADJUST. SEE SEC., SERVICE AND REPAIR.</p> <p>2. REALIGN OR REPLACE PUSHOUT BAR.</p> <p>3. UNLOAD UNIT AS DESCRIBED IN SEC. 3, OPERATION.</p> <p>4. REPAIR OR REPLACE LINKAGE.</p> <p>5. PERFORM TEST FOR LEAKING CYLINDER PISTON CUP AND REPAIR AS REQUIRED. SEE SEC. 9, SERVICE AND REPAIR.</p> <p>6. REPLACE TUBING.</p> <p>7. CHECK PRESSURE. SEE SEC. 7, CHECK-OUT.</p>
<p><b>LOAD WILL NOT PUSH OUT (CLAMP SLIPS AND PUSHOUT BAR SLIDES THROUGH PUSHOUT PLATE)</b></p> <p>1. PUSHOUT BAR HAS GREASE ON IT.</p> <p>2. PUSHOUT BAR IS WORN.</p> <p>3. UNLOADING BODY ON UPHILL GRADE.</p> <p>4. REFUSE JAMMED BEHIND CLAMP LEVER PREVENTING CLAMP FROM BEING APPLIED.</p> <p>5. U-CUPS IN CLAMP CYLINDER LEAK.</p> <p>6. CLAMP CYLINDER MOUNTING BROKEN OR LOOSE.</p> <p>7. SEQUENCE VALVE PRESSURE IS TOO LOW.</p> <p>8. CLAMP CYLINDER NOT HOLDING.</p> <p>9. CLAMP PARTS WORN.</p> <p>10. SPRING BOTTOMS OUT BEFORE CLAMP IS TIGHT.</p>	<p>1. CLEAN BAR AND AREA AROUND BAR.</p> <p>2. REPLACE PUSHOUT BAR OR INSTALL SHIMS BEHIND STATIONARY BLOCK.</p> <p>3. UNLOAD BODY ON LEVEL OR DOWNHILL GRADE (REAR OF UNIT LOWER THAN CAB).</p> <p>4. CLEAN OUT AREA AROUND CLAMP.</p> <p>5. PERFORM TEST FOR LEAKING CYLINDER CUPS AND REPAIR. SEE SEC. 9, SERVICE AND REPAIR.</p> <p>6. REPAIR OR REPLACE MOUNTING. SEE CLAMP ASSEMBLY, SEC. 9, SERVICE AND REPAIR.</p> <p>7. REPLACE SEQUENCE VALVE CARTRIDGE. SEE SEC. 9, SERVICE AND REPAIR.</p> <p>8. PERFORM TEST FOR LEAKING CYLINDER CUPS. SEE SEC. 9, SERVICE AND REPAIR.</p> <p>9. REPLACE WORN PARTS. SEE CLAMP ASSEMBLY SEC. 9, SERVICE AND REPAIR.</p> <p>10. SHIM CLAMP.</p>

## TROUBLESHOOTING

POSSIBLE CAUSE	REMEDY
<b>PUSHOUT PLATE RETURNS WHEN PUSHOUT CYLINDER IS RETRACTED (CLAMP WILL NOT RELEASE)</b>	
<ol style="list-style-type: none"> <li>1. REFUSE UNDER PUSHOUT BAR AND/OR REFUSE JAMMING AGAINST PUSHOUT PLATE.</li> <li>2. CLAMP SPRING BROKEN.</li> <li>3. PUSHOUT BAR BENT AND BINDING ON PUSHOUT PLATE.</li> <li>4. CRACKED OR BROKEN CLAMP BLOCK.</li> <li>5. OPERATOR HOLDING SPEED UP BUTTON.</li> </ol>	<ol style="list-style-type: none"> <li>1. CLEAN OUT AREA AROUND PUSHOUT BAR AND CLAMP.</li> <li>2. REPLACE SPRING CLAMP ASSEMBLY. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>3. STRAIGHTEN OR REPLACE PUSHOUT BAR.</li> <li>4. REPLACE CLAMP BLOCK. SEE CLAMP ASSEMBLY, SEC. 9, SERVICE AND REPAIR.</li> <li>5. RELEASE SPEED UP BUTTON</li> </ol>
<b>CYCLE TIME TOO SLOW</b>	
<ol style="list-style-type: none"> <li>1. SOLENOID TO CARBURETOR OR GOVERNOR LINKAGE CABLE OUT OF ADJUSTMENT.</li> <li>2. HYDRAULIC FLUID LEVEL TOO LOW.</li> <li>3. HYDRAULIC FLUID FILTER NEEDS SERVICING.</li> <li>4. HYDRAULIC TANK BREATHER DIRTY.</li> <li>5. HYDRAULIC PUMP WORN OR DEFECTIVE.</li> <li>6. OPERATING CYLINDER PISTON CUPS LEAKING.</li> <li>7. INCORRECT GRADE OF HYDRAULIC FLUID FOR CURRENT OPERATING CONDITIONS.</li> <li>8. SOLENOID MOUNTING LOOSE OR BROKEN.</li> <li>9. SOLENOID OR WIRING DEFECTIVE.</li> <li>10. DEFECTIVE GOVERNOR (DIESEL ENGINE).</li> </ol>	<ol style="list-style-type: none"> <li>1. ADJUST CABLE TO ACHIEVE 32 SECONDS CYCLE TIME.</li> <li>2. FILL TO PROPER LEVEL. SEE SEC. 6, PREVENTIVE MAINTENANCE.</li> <li>3. SERVICE FILTER. SEE SEC. 6, PREVENTIVE MAINTENANCE.</li> <li>4. SERVICE BREATHER. SEE SEC. 6, PREVENTIVE MAINTENANCE.</li> <li>5. REPLACE PUMP. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>6. PERFORM TEST FOR LEAKING OPERATING CYLINDER CUPS AND REPAIR AS REQUIRED. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>7. REFILL WITH PROPER GRADE OF HYDRAULIC FLUID. SEE SEC. 5, SPECIFICATIONS</li> <li>8. REMOUNT SOLENOID SECURELY (ON ENGINE IF POSSIBLE)</li> <li>9. REPAIR OR REPLACE AS REQUIRED. SEE ELECTRICAL SYSTEM, SEC. 9, SERVICE AND REPAIR.</li> <li>10. DIESEL ENGINE MUST HAVE A FULL VARIABLE SPEED GOVERNOR TO PROPERLY OPERATE PACKER.</li> </ol>
<b>TAILGATE WILL NOT RAISE</b>	
<ol style="list-style-type: none"> <li>1. TAILGATE CLAMPS STILL ENGAGED.</li> <li>2. INSUFFICIENT HYDRAULIC PRESSURE.</li> <li>3. HYDRAULIC PUMP IS DEFECTIVE.</li> <li>4. SPRING IN RELIEF SECTION OF 2-SPOOL DIRECTIONAL VALVE OUT OF ADJUSTMENT OR BROKEN.</li> <li>5. TAILGATE LIFT CYLINDERS LEAKING OR DEFECTIVE.</li> <li>6. CONTROL LINKAGE BENT OR BROKEN.</li> <li>7. RESTRICTION IN TAILGATE CYLINDER HOSE.</li> </ol>	<ol style="list-style-type: none"> <li>1. DISCONNECT CLAMPS AND SWING FREE OF TAILGATE.</li> <li>2. CHECK MAIN PRESSURE. SEE SEC. 7, CHECK-OUT PROCEDURES.</li> <li>3. REPLACE PUMP. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>4. ADJUST OR REPLACE SPRING AS NECESSARY. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>5. REPAIR OR REPLACE AS REQUIRED. SEE SEC. 9, SERVICE AND REPAIR.</li> <li>6. REPAIR OR REPLACE LINKAGE AS REQUIRED.</li> <li>7. REMOVE AND CLEAN HOSE.</li> </ol>

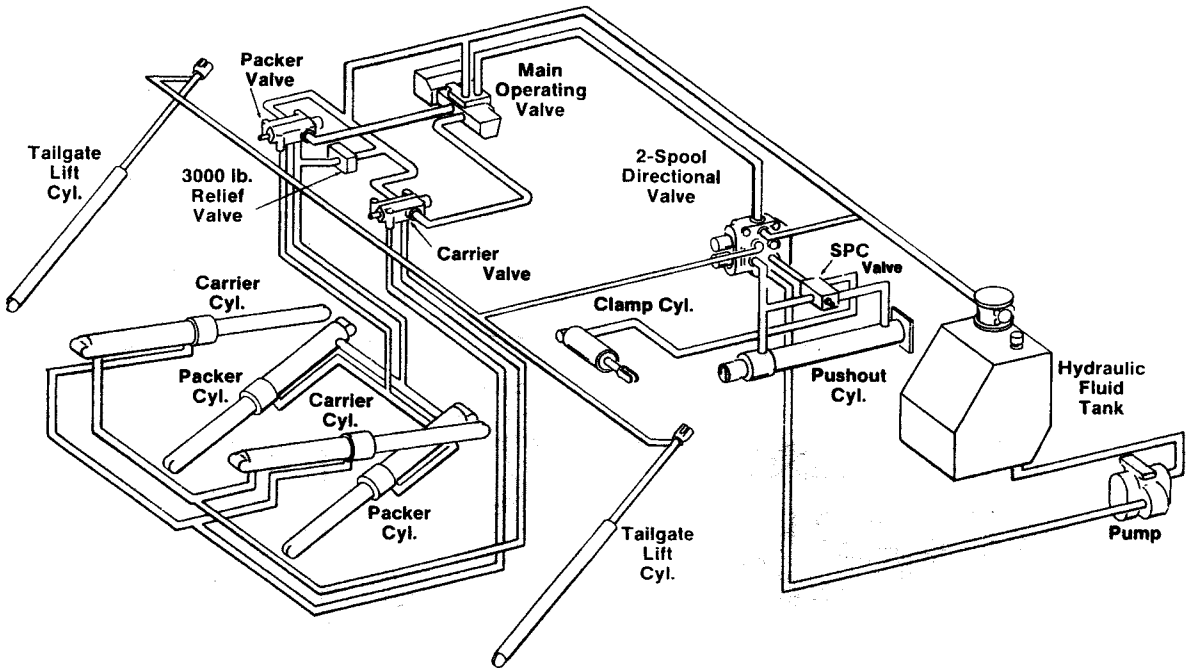
TROUBLESHOOTING

REMEDY	TROUBLE CAUSE
<p>1. RELEASE SPEED UP BUTTON</p> <p>2. ASSEMBLY, SEC. 8 SERVICE AND REPAIR</p> <p>3. REPLACE CLAMP BLOCK, SEE CLAMP</p> <p>4. STRAIGHTEN OR REPLACE PUSHOUT BAR</p> <p>5. SEC. 8 SERVICE AND REPAIR</p> <p>6. REPLACE SPRING CLAMP ASSEMBLY, SEE</p> <p>7. CLEAN OUT AREA AROUND PUSHOUT BAR AND CLAMP</p>	<p>1. OPERATOR HOLDING SPEED UP BUTTON</p> <p>2. CRACKED OR BROKEN CLAMP BLOCK</p> <p>3. PUSHOUT BAR BENT AND BINDING ON PUSHOUT PLATE</p> <p>4. CLAMP SPRING BROKEN</p> <p>5. REUSE UNDER PUSHOUT BAR AND/OR REUSE JAMMING AGAINST PUSHOUT PLATE</p> <p>6. REUSE UNDER PUSHOUT BAR AND/OR (CLAMP W/OT HOT RELEASE)</p>
<p>1. ADJUST CABLE TO ADOPT 12 SECONDS CYCLE TIME</p> <p>2. FILL TO PROPER LEVEL, SEE SEC. 8 PREVENTIVE MAINTENANCE</p> <p>3. SERVICE FILTER, SEE SEC. 8 PREVENTIVE MAINTENANCE</p> <p>4. SERVICE BREATHER, SEE SEC. 8 PREVENTIVE MAINTENANCE</p> <p>5. REPLACE PUMP, SEE SEC. 8 SERVICE AND REPAIR</p> <p>6. PERFORM TEST FOR LEAKING OPERATING CYLINDER CHIPS AND REPAIR AS REQUIRED, SEE SEC. 8 SERVICE AND REPAIR</p> <p>7. REFILL WITH PROPER GRADE OF HYDRAULIC FLUID, SEE SEC. 8 SPECIFICATIONS</p> <p>8. REMOUNT SOLENOID SECURELY FOR ENGINE FIT HOUSING</p> <p>9. REPAIR OR REPLACE AS REQUIRED, SEE ELECTRICAL SYSTEM, SEC. 8 SERVICE AND REPAIR</p> <p>10. DIESEL ENGINE MUST HAVE A FULL VARIABLE SPEED GOVERNOR TO PROPERLY OPERATE PATTERN</p>	<p>1. POLISH TO CARBURETOR OR GOVERNOR linkage CABLE OUT OF ADJUSTMENT</p> <p>2. HYDRAULIC FLUID LEVEL TOO LOW</p> <p>3. HYDRAULIC FLUID FILTER WERE SERVING</p> <p>4. HYDRAULIC TANK BREATHER DIRTY</p> <p>5. HYDRAULIC PUMP WORN OR DEFECTIVE</p> <p>6. OPERATING CYLINDER PISTON CUPS LEAKING</p> <p>7. INDIRECT GRADE OF HYDRAULIC FLUID FOR CURRENT OPERATING CONDITIONS</p> <p>8. SOLENOID MOUNTING LOOSE OR BROKEN</p> <p>9. SOLENOID OR WIRING DEFECTIVE</p> <p>10. DEFECTIVE GOVERNOR (DIESEL ENGINE)</p>
<p>1. DISCONNECT CLAMPS AND SWING FREE OF TAILGATE</p> <p>2. CHECK MAIN PRESSURE, SEE SEC. 7 CHECK OUT HOUSING</p> <p>3. REPLACE PUMP, SEE SEC. 8 SERVICE AND REPAIR</p> <p>4. ADJUST OR REPLACE SPRING AS NECESSARY, SEE SEC. 8 SERVICE AND REPAIR</p> <p>5. REPAIR OR REPLACE AS REQUIRED, SEE SEC. 8 SERVICE AND REPAIR</p> <p>6. REPAIR OR REPLACE LIKAGE AS REQUIRED</p> <p>7. REMOVE AND CLEAN HOSE</p>	<p>1. TAILGATE CLAMPS BENT ENGAGED</p> <p>2. INSUFFICIENT HYDRAULIC PRESSURE</p> <p>3. HYDRAULIC PUMP IS DEFECTIVE</p> <p>4. SPRING W/ REUSE SECTION OF 2-BROOK DIRECTIONAL VALVE OUT OF ADJUSTMENT OR BROKEN</p> <p>5. TAILGATE W/OT CYLINDERS LEAKING OR DEFECTIVE</p> <p>6. CONTROL LIKAGE BENT OR BROKEN</p> <p>7. RESTRICTION IN TAILGATE CYLINDER HOSE</p>

**DESCRIPTION OF HYDRAULIC SYSTEM**

The following is a description with flow diagrams of what happens in the hydraulic system during the loading, packing and unloading operations of the 2R11 Packmaster.

Operator action is presented and then a description of hydraulic flow and the interaction of system components (i.e., valves and cylinders) follows. Before proceeding to the flow diagram refer to the illustration and become familiar with the system component nomenclature.

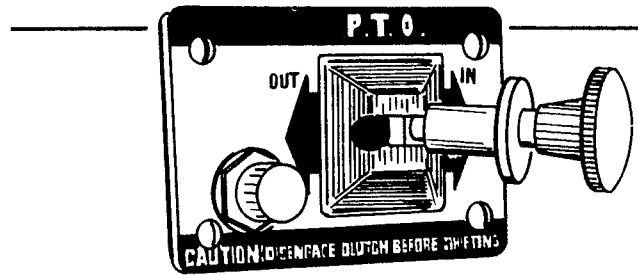
**SYSTEM COMPONENT NOMENCLATURE**

## TROUBLESHOOTING

**NEUTRAL (with packer plate in "Home" position.**

**OPERATOR ACTION**

Operator starts truck and engages PTO and speed up system.

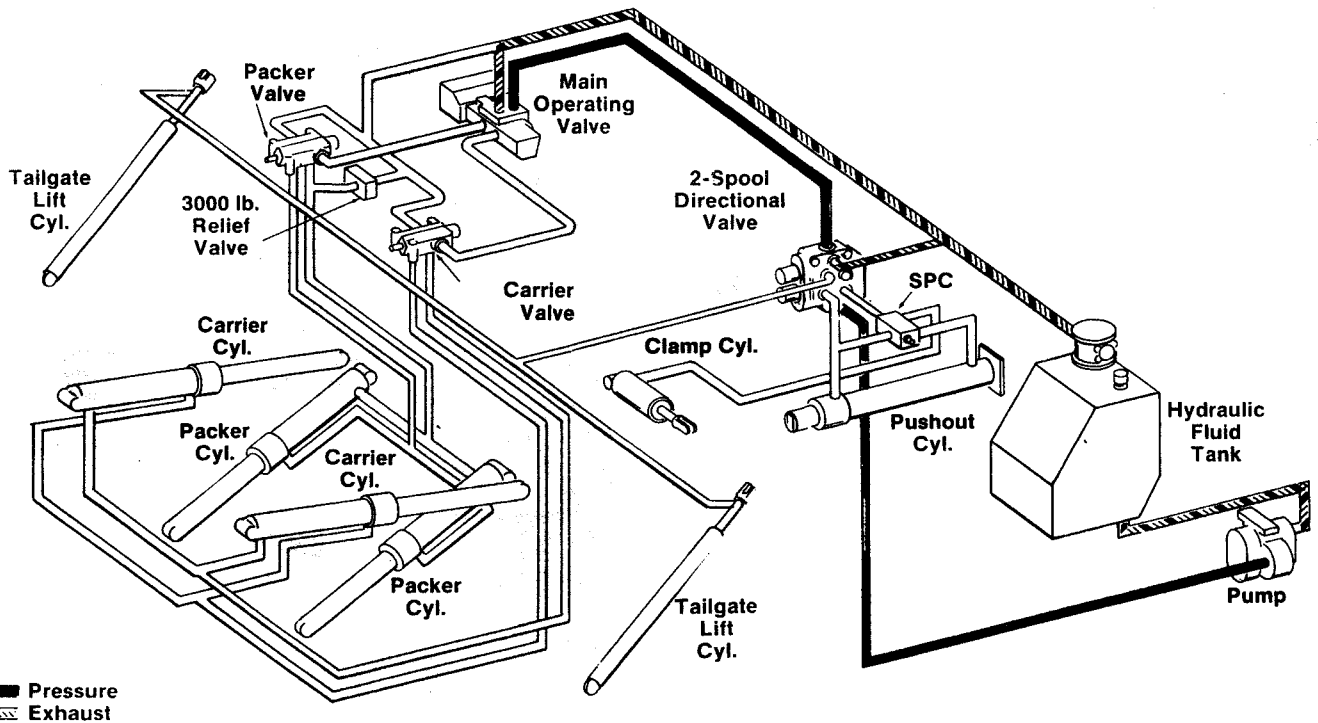


**HYDRAULIC SYSTEM**

Hydraulic fluid flows from the tank, by gravity, to the pump. From there it is pumped to the 2-spool Directional Valve. Flow continues through the valve to and through the Main Operating Valve and then back to the tank. Excess flow is diverted from the 2-spool valve also back to the tank.

**NOTE**

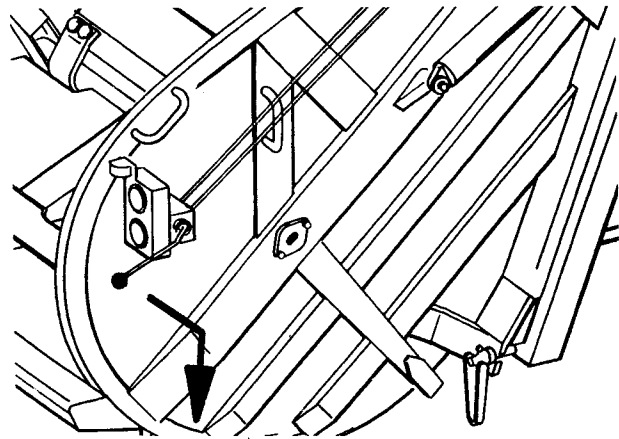
A description of the Main Operating Valve (MOV) function may be found later in this section.



**PACKER PLATE SWEEPS BACK OVER LOAD**

**OPERATOR ACTION**

Operator moves Control Lever out and down to start compaction cycle.

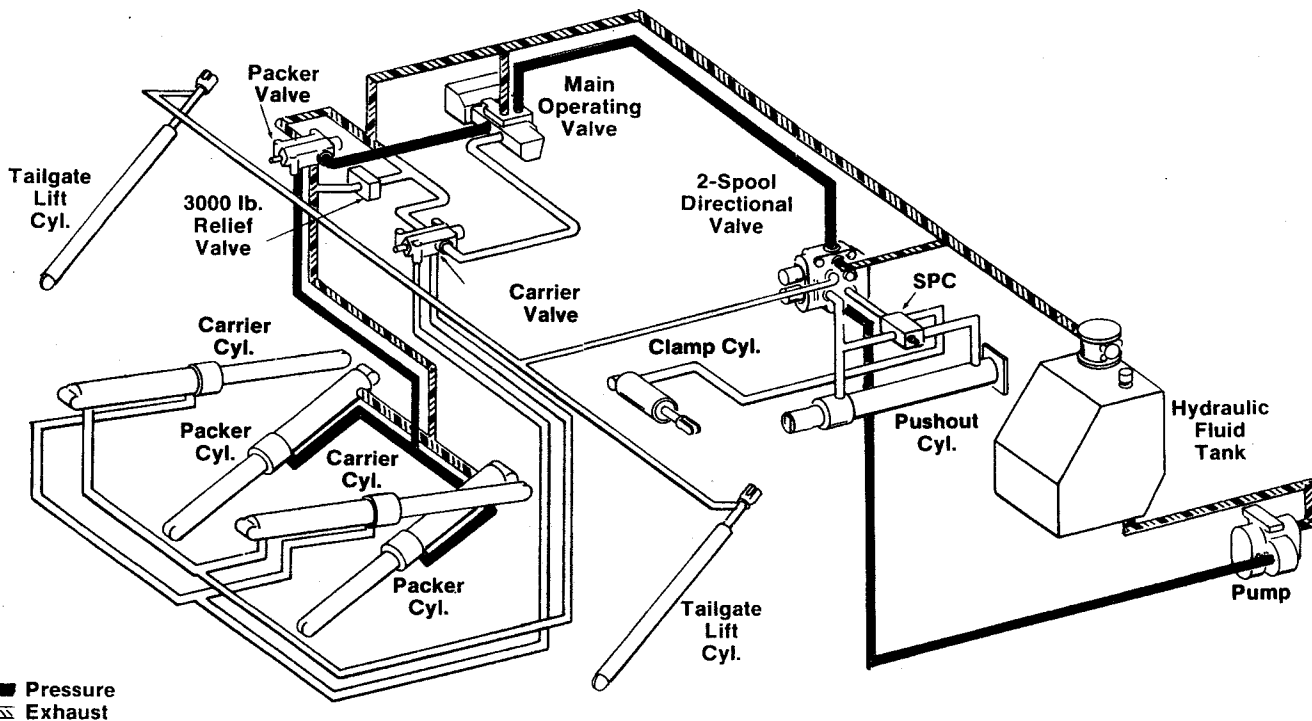


**HYDRAULIC SYSTEM**

Operator action causes the Main Operating Valve to shift, diverting flow through the Packer Plate Single Spool Valve to the rod end of the packer plate cylinders. The packer plate cylinders retract causing the packer plate to sweep rearward over the load. Return fluid flow from the cylinder is back through the single-spool valve to the tank.

**NOTE**

A description of the Main Operating Valve (MOV) function may be found later in this section.

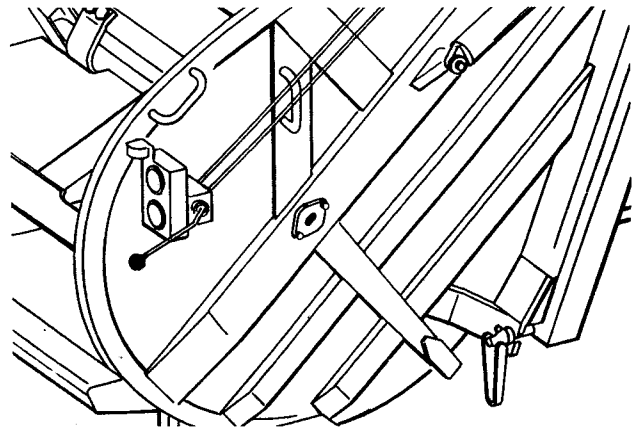


**TROUBLESHOOTING**

**CARRIER & PACKER PLATES MOVE DOWN TO INTERRUPTED CYCLE POSITION**

**OPERATOR ACTION**

None—Main Operating Valve shifts automatically.

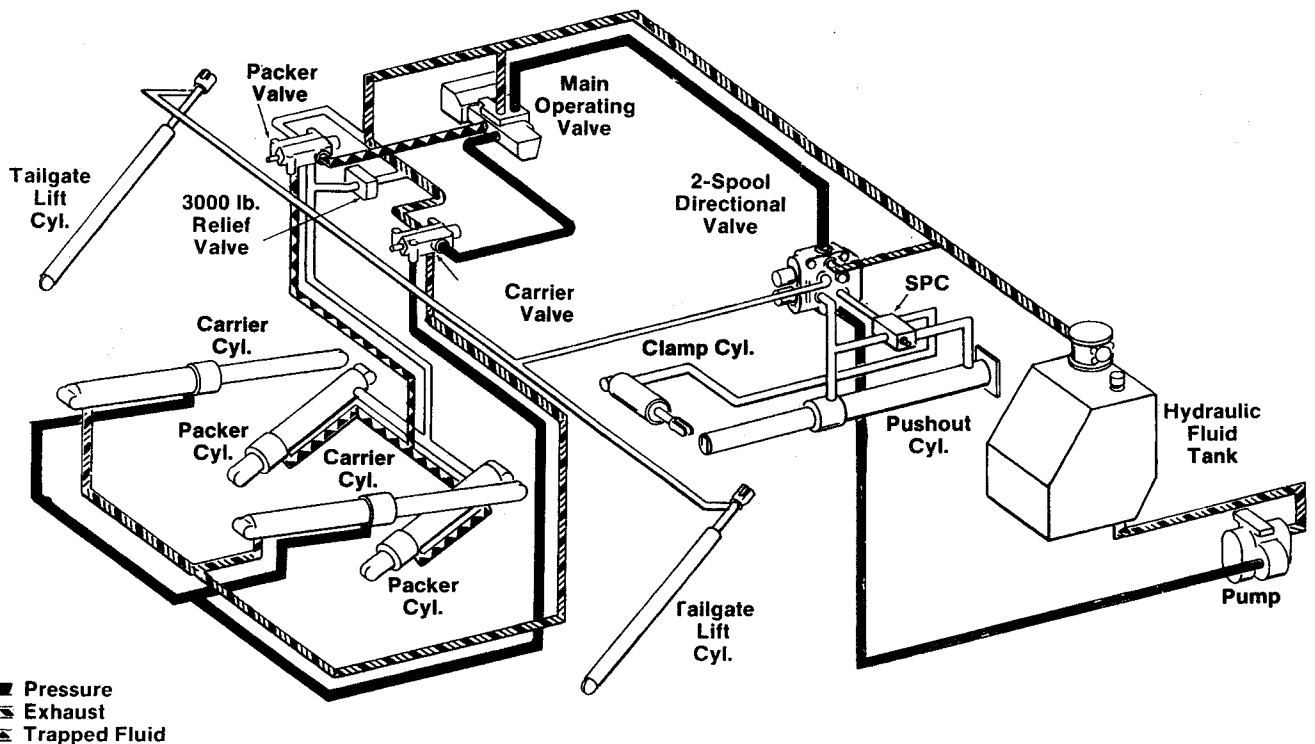


**HYDRAULIC SEQUENCE**

At the end of the packer plate cylinder stroke, pressure builds up to 1200 PSI causing the main operating valve to shift, diverting flow through the carrier plate Single Spool Valve to the rod end of the carrier cylinders. The cylinders retract, moving the carrier and packer plate down into the "interrupted" cycle position (trapped fluid keeps the packer plate cylinders retracted). At the end of the carrier cylinder retraction stroke, pressure builds up to 1400 PSI causing the main operating valve to shift to neutral. (Knock out)

**NOTE**

A description of the Main Operating Valve (MOV) function may be found later in this section.



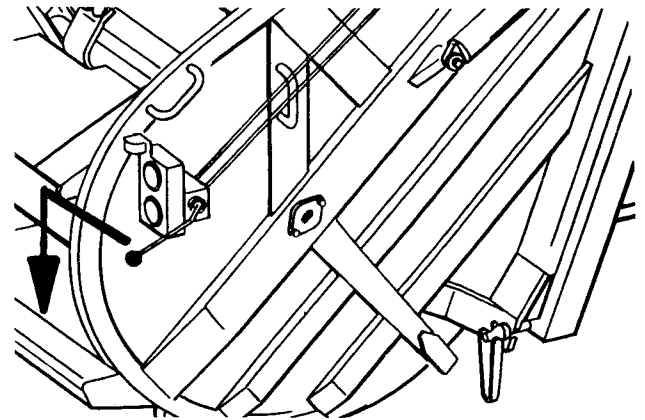


**TROUBLESHOOTING**

**START OF PACKING CYCLE**

**OPERATOR ACTION**

Operator moves Control Lever in and down to start compaction cycle.

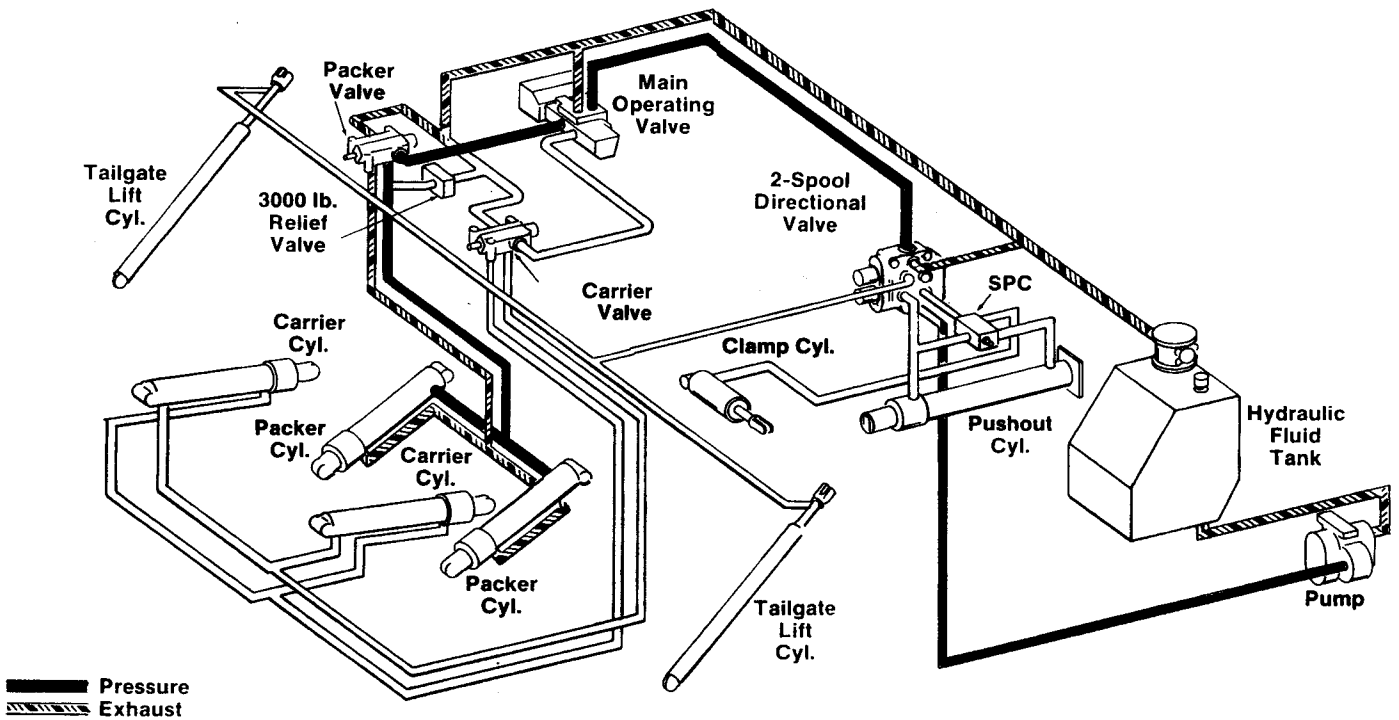


**HYDRAULIC SEQUENCE**

Fluid flow is from the main operating valve through packer single spool valve to the case end of packer plate cylinders. As the cylinders extend, the packer plate sweeps the load forward in the hopper. As the packer cylinder extension stroke ends, pressure builds up to 1200 PSI causing the main operating valve to shift. (Reverse)

**NOTE**

A description of the Main Operating Valve (MOV) function may be found later in this section.

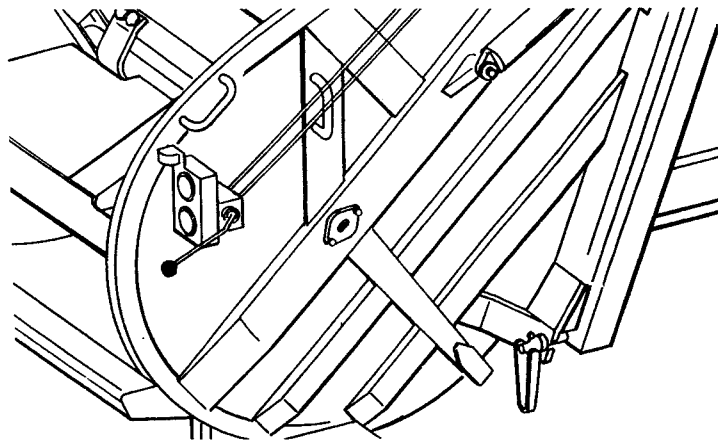


## TROUBLESHOOTING

### PACKING REFUSE

#### OPERATOR ACTION

None-Main Operating Valve shifts automatically.

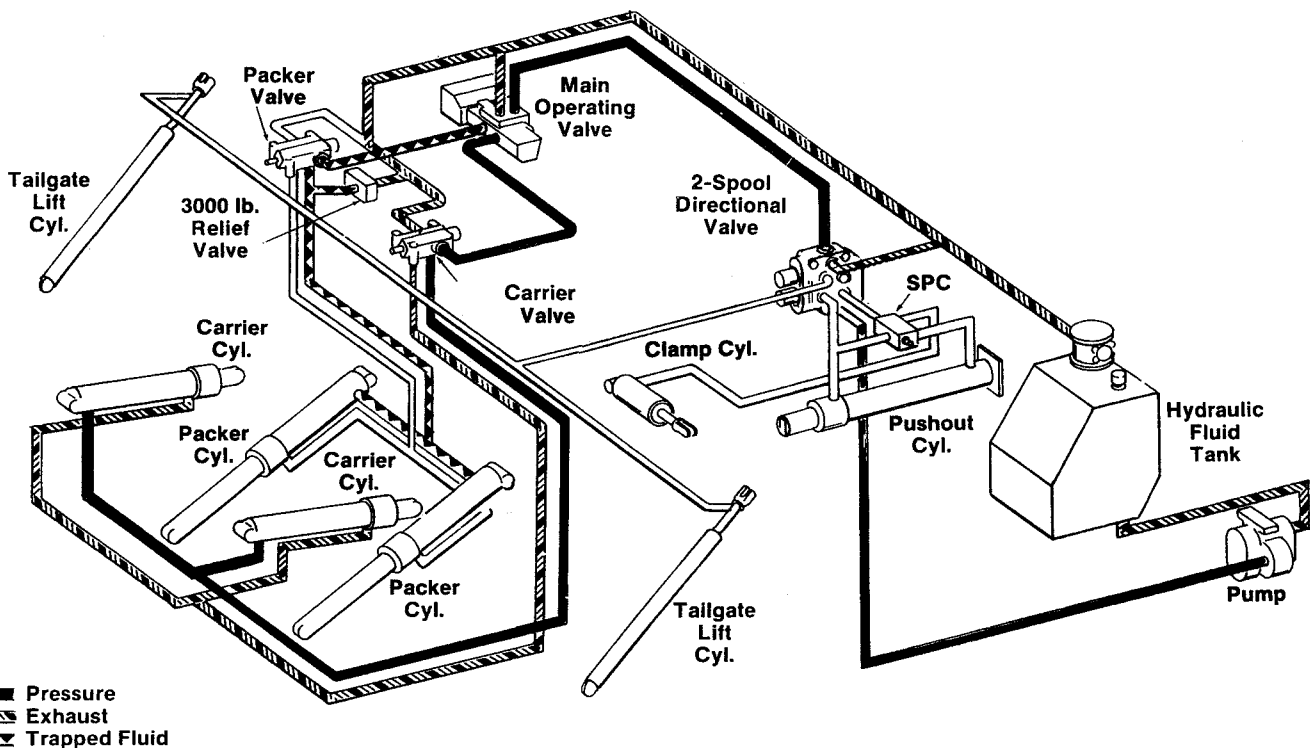


#### HYDRAULIC SEQUENCE

Fluid flows from the main operating valve through the carrier plate single spool valve to the case end of the carrier plate cylinders. The cylinders extend, moving the carrier and packer plates up, packing refuse against the pushout plate. When the pressure reaches 1400 PSI the main operating valve shifts into neutral and the packing cycle is completed. As the carrier cylinders apply force to compact the refuse, the pressure of the trapped fluid in the packer cylinders will increase. Should this pressure reach 3000 PSI, a relief valve will open reducing the pressure by allowing some trapped fluid to escape.

#### NOTE

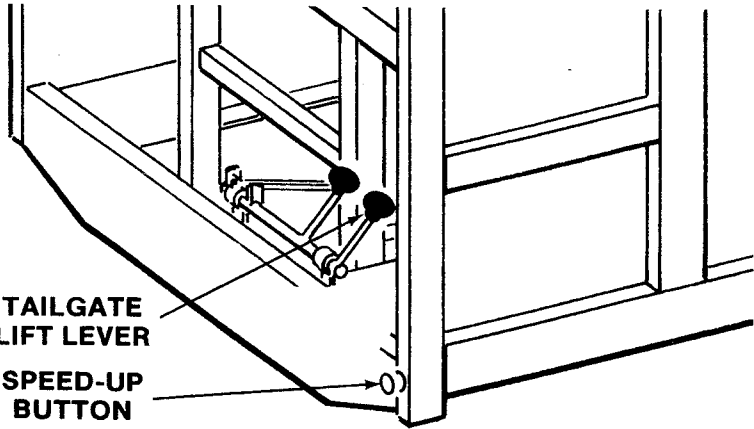
A description of the Main Operating Valve (MOV) function may be found later in this section.



**RAISING TAILGATE**

**OPERATOR ACTION**

- Operator opens packer plate to release pressure.
- Operator loosens tailgate clamps.
- Operator depresses speed-up button.
- Operator pulls tailgate lift lever forward.

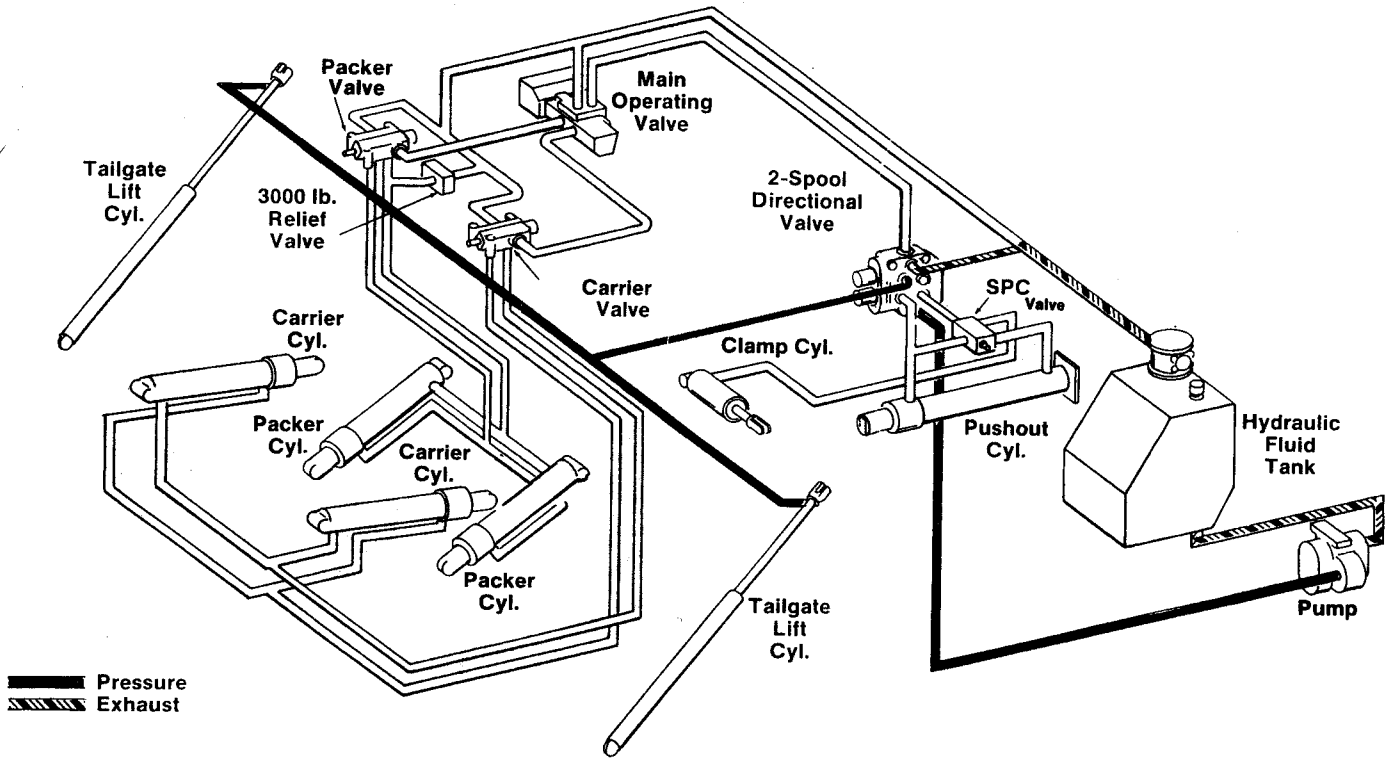


**HYDRAULIC SEQUENCE**

Pulling the tailgate lift lever forward shifts a spool in the 2-spool directional valve causing flow to the tailgate lift cylinders. The cylinders extend, causing the tailgate to raise. Excess fluid flow from the 2-spool valve returns back to the tank.

**NOTE**

A description of the Main Operating Valve (MOV) function may be found later in this section.

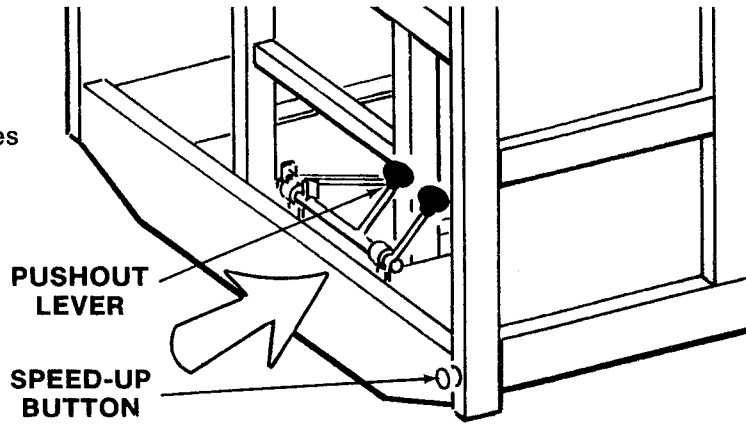


## TROUBLESHOOTING

### EJECTING LOAD

#### OPERATOR ACTION

Operator depresses speed-up button and moves pushout lever rearward.



#### HYDRAULIC SEQUENCE

Pushing the pushout lever rearward shifts a spool in the 2-spool directional valve causing flow to the clamp cylinder. As the cylinder extends, it clamps the pushout plate to the pushout bar attached to the pushout cylinder.

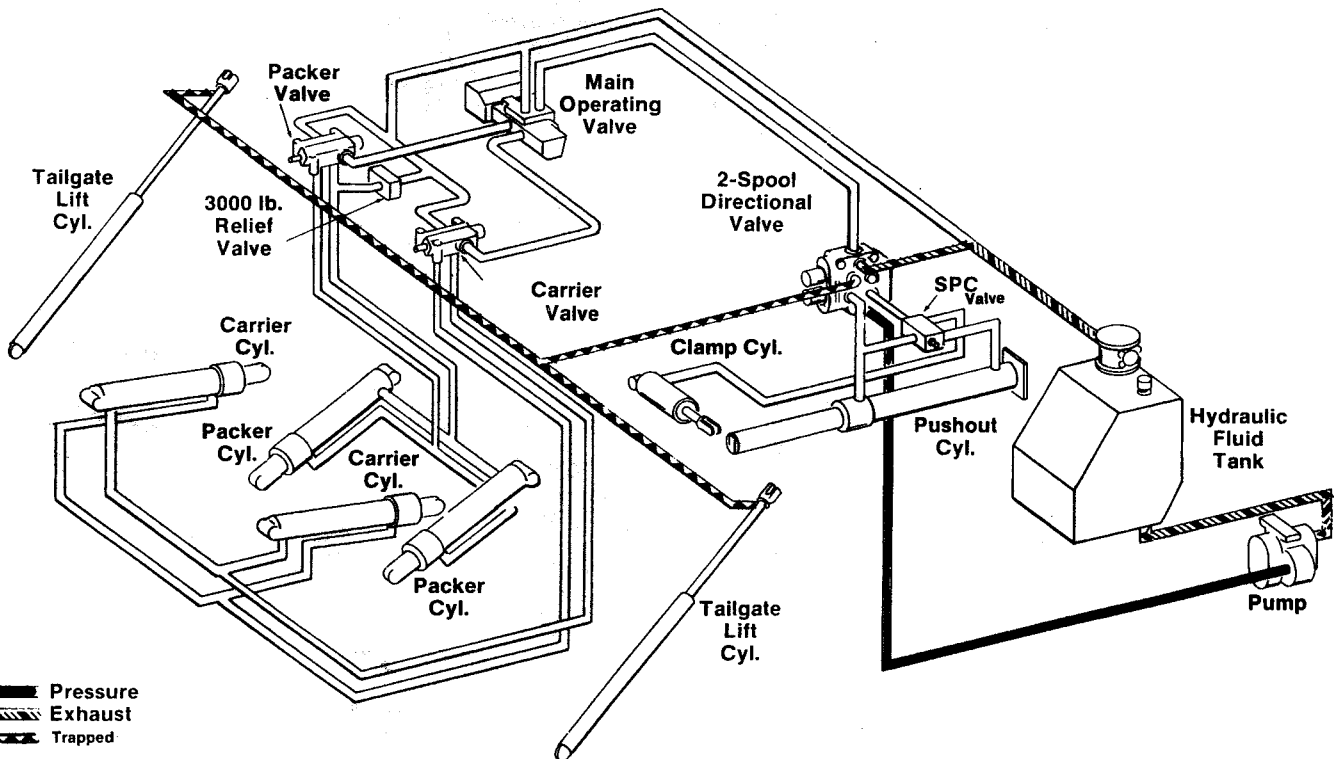
When the hydraulic pressure reaches 1200 PSI, the sequence pilot check valve (SPC) opens diverting flow to the case end of the pushout cylinder. As the cylinder extends the pushout plate moves to the rear, ejecting the load.

#### NOTE

A description of the Main Operating Valve (MOV) function may be found later in this section.

#### NOTE

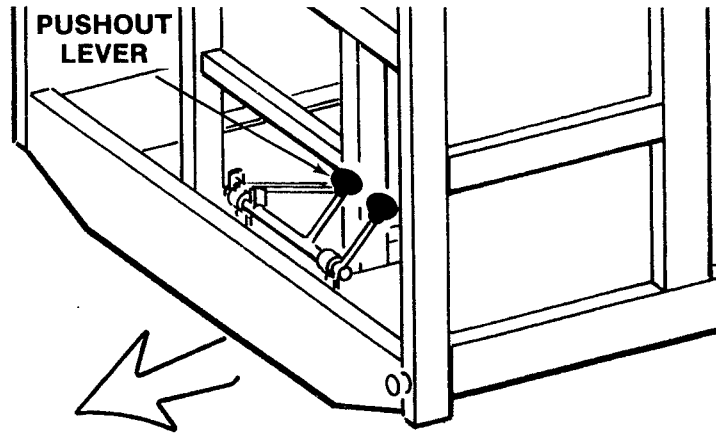
This description applies to the standard pushout system. If you have the telescopic pushout option, refer to Sec. 10, OPTIONS for a description of the applicable system.



**RETRACTING PUSHOUT BAR**

**OPERATOR ACTION**

Operator pulls pushout lever forward.



**HYDRAULIC SEQUENCE**

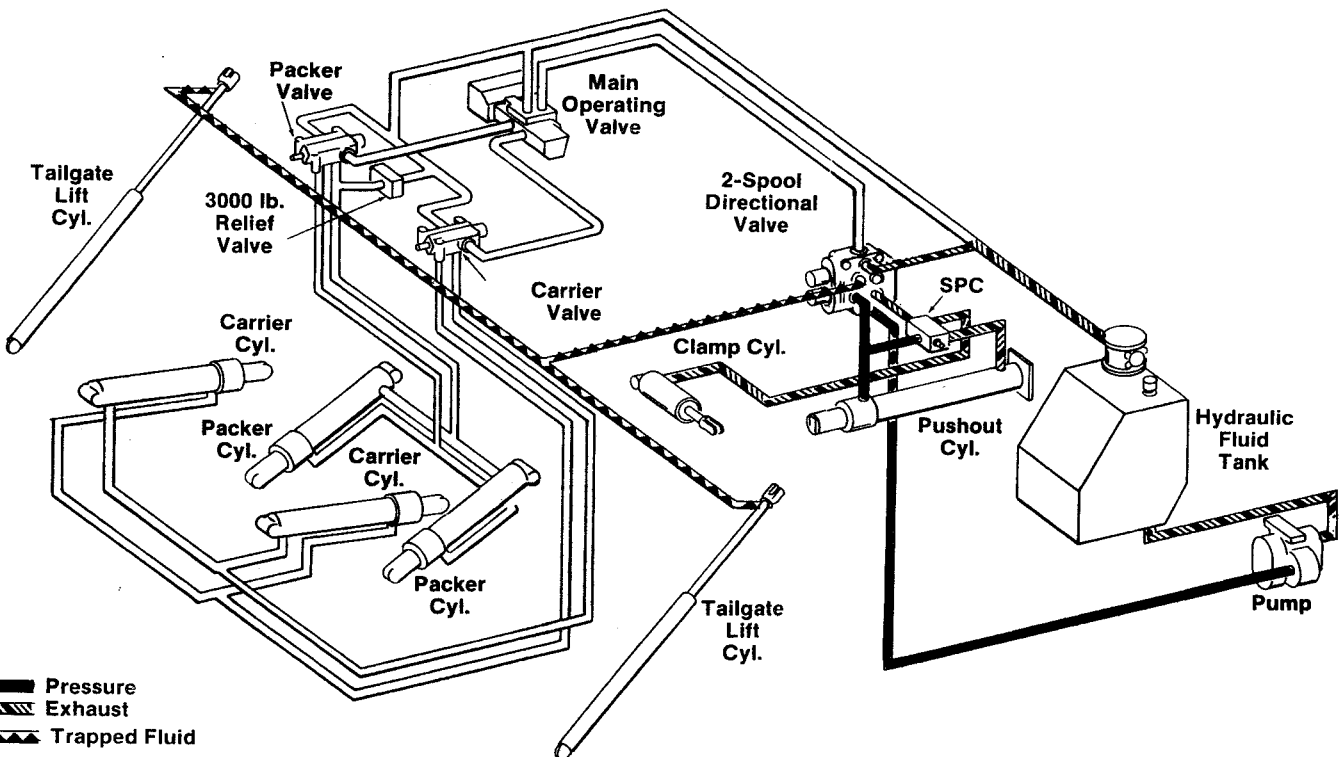
Moving the pushout lever forward shifts a spool in the 2-spool valve causing flow to the rod end of the pushout cylinder and to the pilot check valve. Releasing this check valve allows fluid to drain from the clamp cylinder, releasing the clamp mechanism so that the pushout plate remains where it is, while the pushout cylinder is retracted.

**NOTE**

*Ejecting the Load and Retracting the Pushout Plate sequences are repeated by the operator as many times as needed to fully eject load. The pushout plate being left further back each time the clamp is released and the pushout cylinder is retracted.*

**NOTE**

*A description of the Main Operating Valve (MOV) function may be found later in this section.*

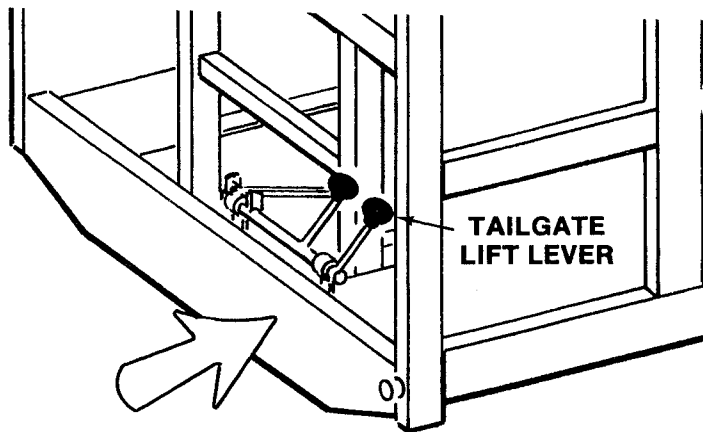


**TROUBLESHOOTING**

**LOWERING TAILGATE**

**OPERATOR ACTION**

Operator pushes tailgate lift lever rearward.

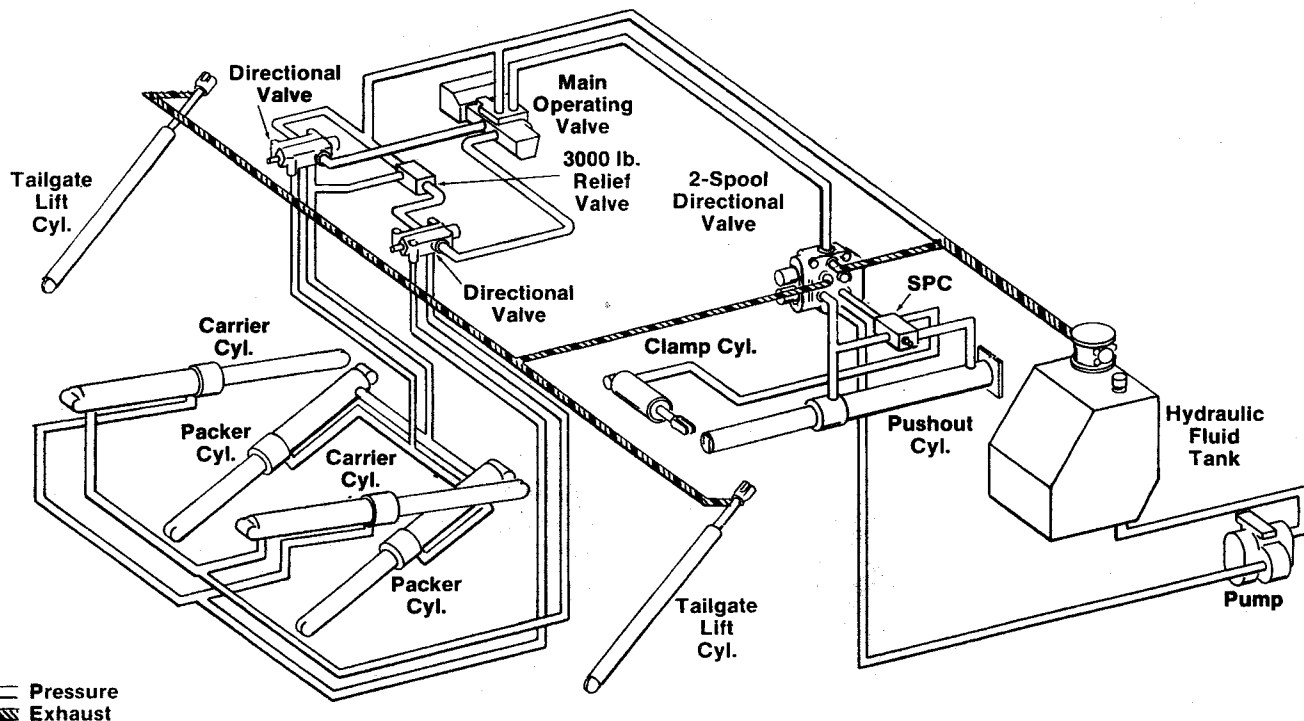


**HYDRAULIC SEQUENCE**

Pushing the tailgate lift lever rearward shifts a spool in the 2-spool valve allowing fluid in the tailgate lift cylinders to drain back to the tank. The weight of the tailgate forces fluid out of the cylinders; the cylinders retract and the tailgate lowers.

**NOTE**

A description of the Main Operating Valve (MOV) function may be found later in this section.



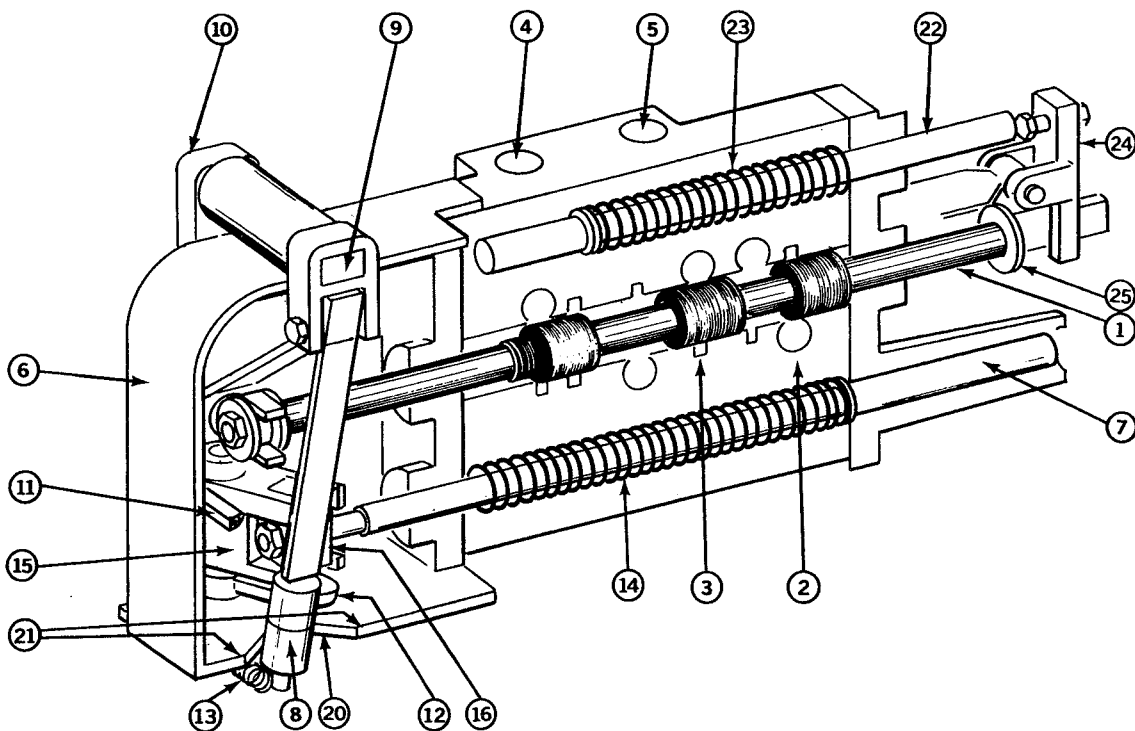
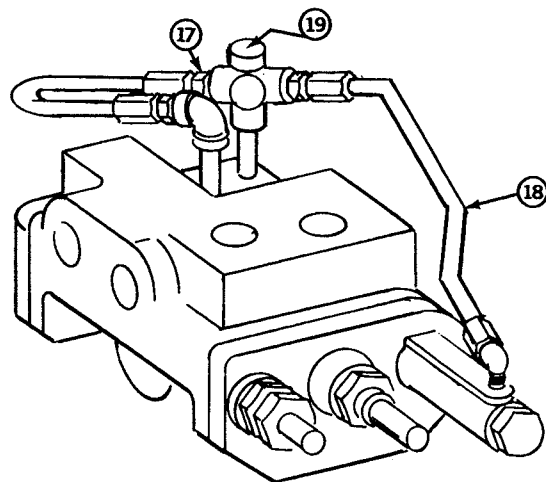
## 2RII MAIN OPERATING VALVE

## DESCRIPTION

The Main Operating Valve is a pressure controlled single spool valve. It has an automatic spool reversing function and an automatic return to neutral function. In the neutral position system fluid flows through the MOV and back to the hydraulic tank. When shifted, the MOV main spool initially diverts pump flow to the packer cylinders to control the packer plate. After reversing, pump flow is diverted to the carrier cylinders to control the carrier plate.

## TERMS YOU NEED TO KNOW

- |                      |                     |
|----------------------|---------------------|
| 1—Main spool         | 14—Reversing spring |
| 2—"P" port           | 15—Reversing yoke   |
| 3—"T" port           | 16—Square block     |
| 4—#1 port            | 17—Check valve      |
| 5—#2 port            | 18—Tubing           |
| 6—Bridge assembly    | 19—Oil jet          |
| 7—Reversing plunger  | 20—"V"              |
| 8—Lower roller arm   | 21—Step             |
| 9—Arm yoke pin       | 22—Knockout plunger |
| 10—Upper roller arm  | 23—Knockout spring  |
| 11—Reversing finger  | 24—Knockout pivot   |
| 12—Trip finger       | 25—Knockout washer  |
| 13—Roller arm spring |                     |

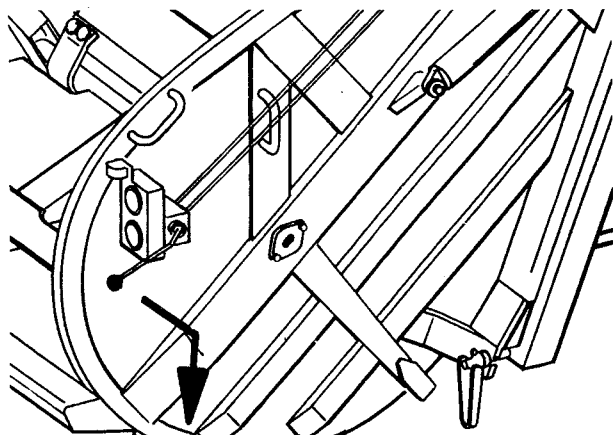


## TROUBLESHOOTING

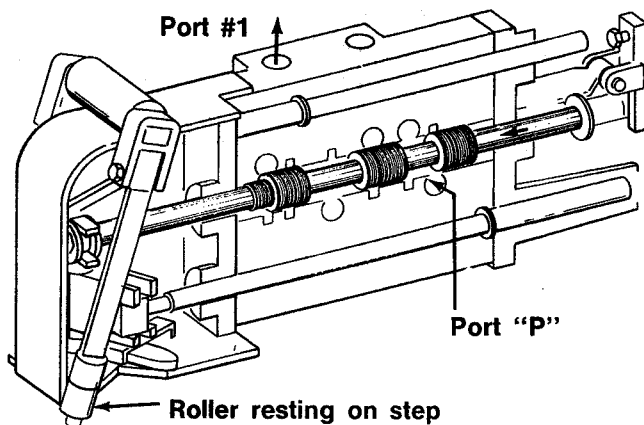
### FIRST HALF OF THE PACKING CYCLE

To start the cycle the operating lever is shifted out and down.

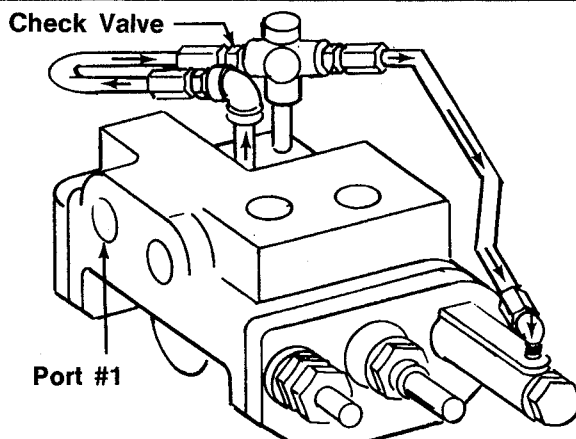
1. The MOV main spool and both the packer and carrier directional valves are shifted together.



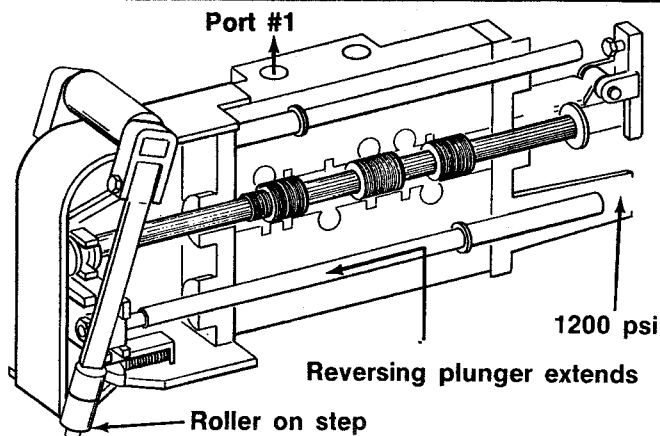
2. Movement of the main spool also pushes the upper roller arm up the "V" ramp to rest on the step.
3. Hydraulic fluid flows into port "P", out port #1, through the packer directional valve, and to the rod end of the packer cylinders. Return fluid is forced out of the case end of the packer cylinders and flows through the packer directional valve to the hydraulic tank.
4. The packer cylinders retract to open the packer plate.



5. Hydraulic fluid from port #1 passes through an external check valve and is routed via tubing to the reversing plunger.



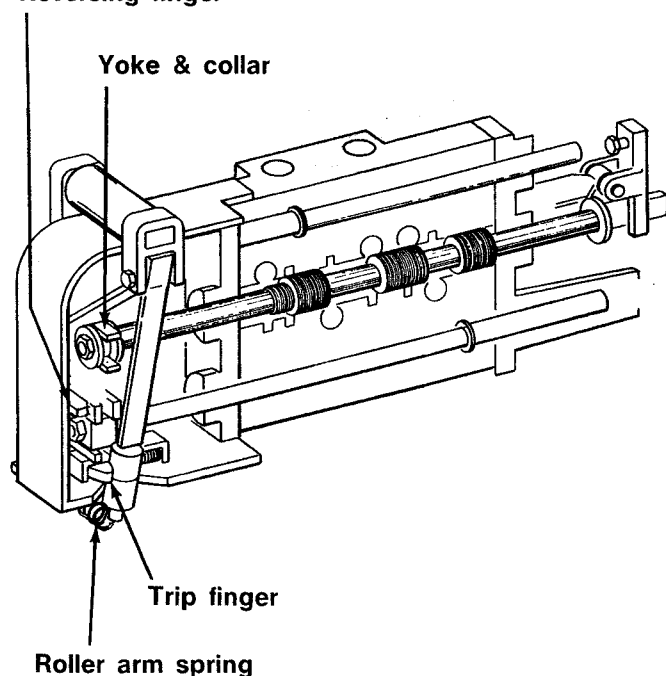
6. When the packing cylinders fully retract, system pressure increases. Since pressure is equal throughout the hydraulic system, pressure also builds behind the reversing plunger.



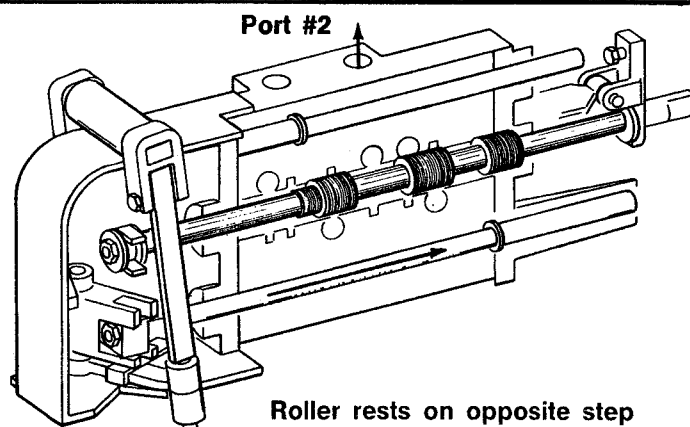


7. As the pressure behind the reversing plunger increases, the plunger gradually extends. At 1200 psi the plunger extension has compressed the reversing spring enough to start the reversing function.
  - a. The extending reversing plunger pushes the trip finger under the lower roller arm.
  - b. The pivot block on the reversing plunger contacts the reversing finger. This contact causes the finger to pivot and push against the upper roller arm.
  - c. Since the upper roller arm is connected to the lower roller arm the lower roller arm is pushed off of the "V" step.
  - d. Once the upper roller arm is on the ramp the roller arm spring pulls the roller arms together causing the lower roller arm to settle into the bottom of the "V".
8. The main spool is connected to the roller arms by a yoke and collar, the movement of the roller arms into the bottom of the "V" also moves the main spool into the neutral position.
9. With the main spool in neutral, fluid flow is blocked to the packer cylinders and to the fully extended reversing plunger.

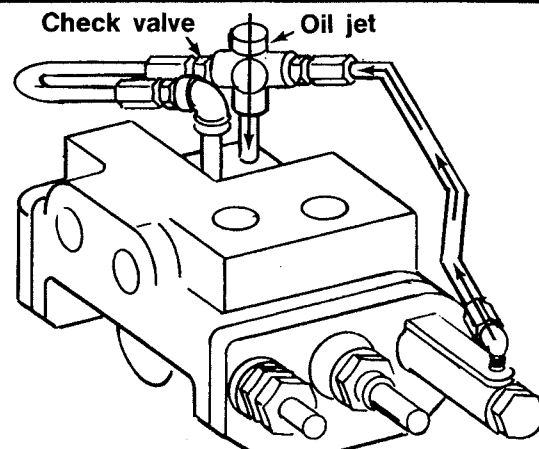
Reversing finger



10. The reversing spring forces the reversing plunger back into the MOV housing. As the plunger retracts the trip finger pulls the lower roller arm up the ramp to rest on the opposite step.

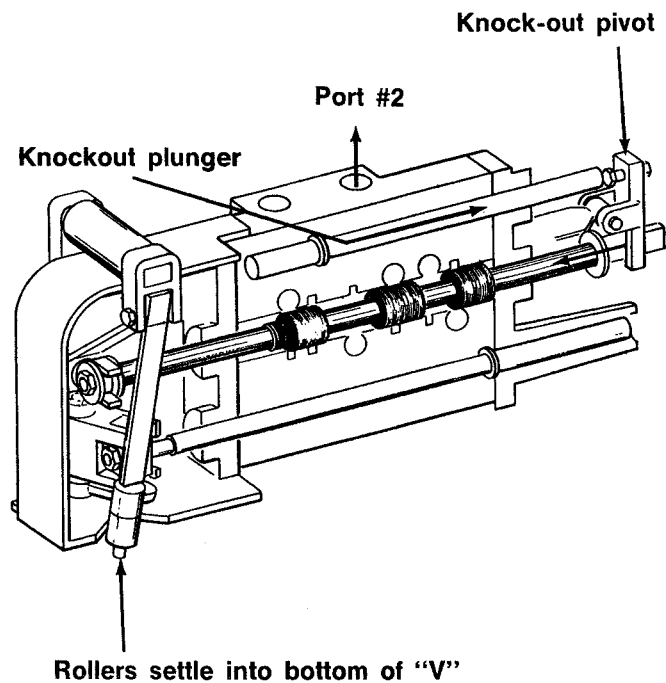


- a. Hydraulic fluid behind the plunger is forced back through the tubing.
- b. The seated check valve forces the hydraulic fluid to flow through the oil jet and back to the hydraulic tank.
- c. The oil jet slows down the returning hydraulic fluid and thus slows down the movement of the reversing plunger.
- d. The force of the reversing spring moves the reversing plunger into the MOV housing and reverses the MOV main spool. The spring also reverses the operating lever linkage.



## TROUBLESHOOTING

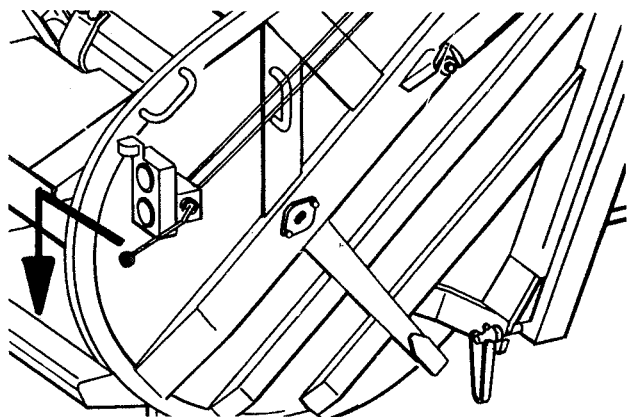
11. When the main spool reverses it diverts fluid flow from port #1 to port #2. Fluid is routed through the carrier directional valve and to the rod end of the carrier cylinders. Return fluid from the case end of the carrier cylinders flows through the carrier directional valve and returns to tank.
12. The carrier cylinders retract, moving the carrier plate down to the interrupt stop position.
13. When the carrier cylinders fully retract and system pressure builds. Hydraulic fluid from port #2 is internally directed to the knock-out plunger.
14. When the pressure behind the plunger is enough to overcome the force of the knockout spring, (1400 psi) the plunger extends and contacts the knock-out pivot. The pivot pushes against the knock-out washer on the main spool.
15. The movement of the main spool moves the lower roller arm off the step and onto the ramp.
16. The roller arm spring pulls both upper and lower rollers together and they settle into the bottom of the "V".
17. The MOV has "knocked out" to neutral. The packer MOV plate is open and the carrier is down in the interrupted stop position.



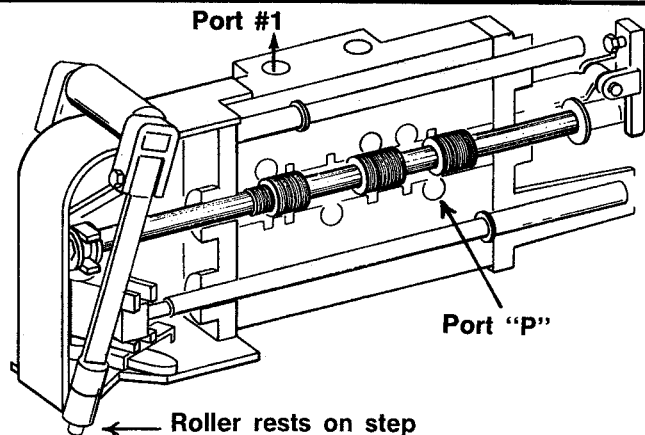
### SECOND HALF OF PACKING CYCLE

To continue the cycle the operating lever is shifted in and down.

1. The MOV main spool is shifted exactly as it was in the first half of the cycle. Both the packer and carrier directional valves are shifted together but opposite the first half of the cycle.

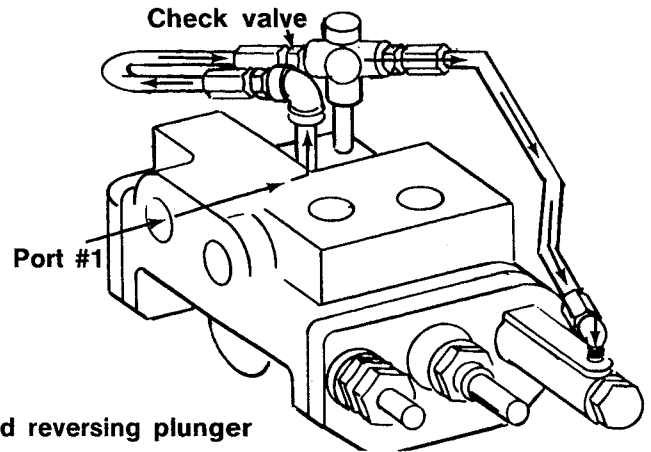


2. Movement of the main spool pushes the lower roller arm up the ramp to rest on the "V" step.
3. Hydraulic fluid flows into port "P", out port #1, through the packer directional valve, and on to the case end of the packer cylinders. Return fluid is forced out of the rod end of the packer cylinders and flows through the packer directional valve back to the hydraulic tank.
4. The packer cylinders extend causing the packer plate to sweep the hopper.



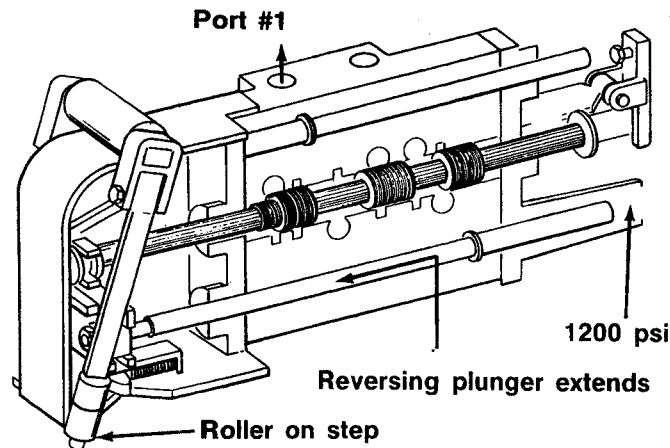
## TROUBLESHOOTING

5. Hydraulic fluid from port #1 passes through an external check valve and is routed via tubing to the reversing plunger.



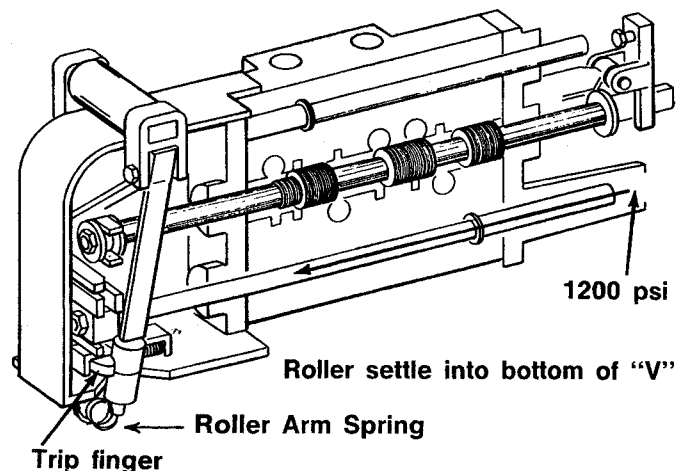
Pressure builds behind reversing plunger

6. When the packer cylinders fully extend system pressure increases. Since pressure is equal throughout the hydraulic system, pressure also builds behind the reversing plunger.



7. As the pressure behind the reversing plunger increases the plunger gradually extends. At 1200 psi the plunger extension has compressed the reversing spring enough to start the reversing function.

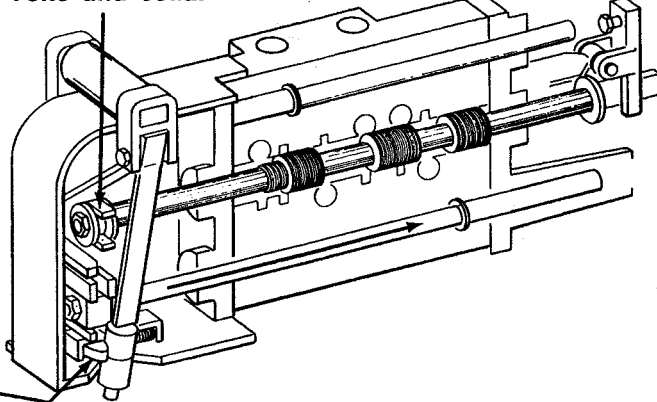
- The extending reversing plunger pushes the trip finger under the lower roller arm.
- The pivot block on the reversing plunger contacts the reversing finger. This contact causes the finger to pivot and push against the upper roller arm.
- Since the upper roller arm is connected to the lower roller arm the lower roller arm is pushed off the "V" step.
- Once the upper roller is on the ramp, the roller arm spring pulls the roller arms together causing the lower roller arm to settle into the bottom of the "V".



## TROUBLESHOOTING

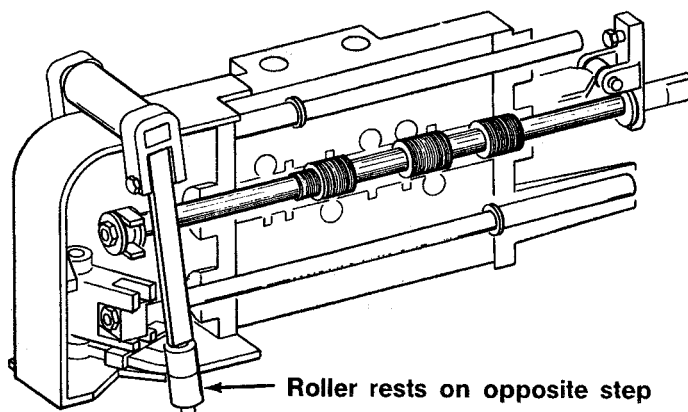
8. The main spool is connected to the roller arms by a yoke and collar, the movement of the roller arms into the bottom of the "V" also moves the main spool into the neutral position.
9. With the main spool in neutral, fluid flow is blocked to the packer cylinders and to the fully extended reversing plunger.

Yoke and collar

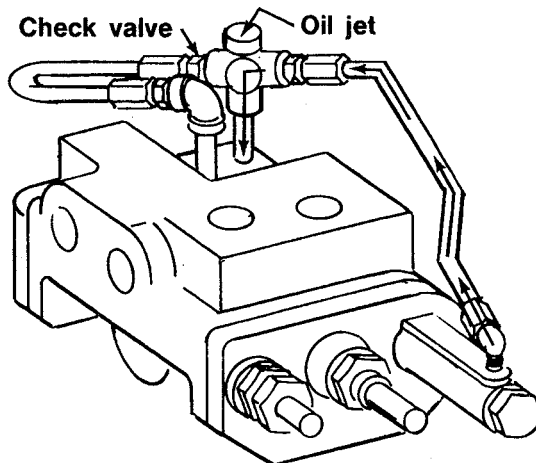


Trip finger

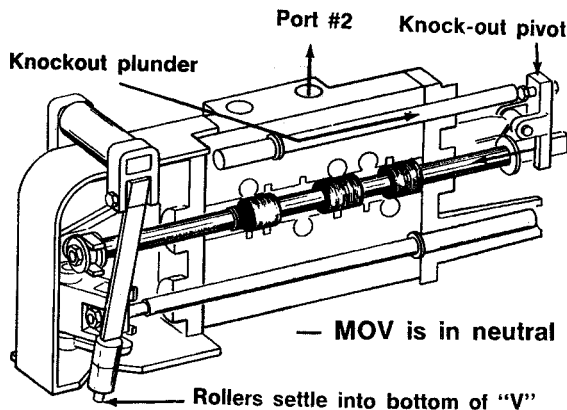
10. The reversing spring forces the reversing plunger back into the MOV housing. As the plunger retracts, the trip finger pulls the lower roller arm up the ramp to rest on the opposite step.
  - a. Hydraulic fluid behind the plunger is forced back through the tubing.
  - b. The seated check valve forces the hydraulic fluid to flow through the oil jet and back to the hydraulic tank.
  - c. The oil jet slows down the returning hydraulic fluid and thus slows down the movement of the reversing plunger.
  - d. The force of the reversing spring moves the reversing plunger into the MOV housing and reverses the MOV main spool. The spring also reverses the operating lever linkage.
11. When the main spool reverses it diverts fluid flow from port #1 to port #2. Fluid is routed through the carrier directional valve, and on to the case end of the carrier cylinders. Return fluid from the rod end of the carrier cylinders flows through the carrier directional valve and returns to the hydraulic tank.
12. The carrier cylinders extend and the carrier plate moves up.
13. When the carrier cylinders fully extend and system pressure builds. Hydraulic fluid from port #2 is internally directed to the knock-out plunger.
14. When the pressure behind the plunger is enough to overcome the force of the knock-out spring (1400 psi) the plunger extends and contacts the knock-out pivot. The pivot pushes against the knock-out washer on the main spool.
15. The movement of the main spool moves the lower roller arm off the step and onto the ramp.
16. The roller arm spring pulls both upper and lower rollers together and they settle into the bottom of the "V".
17. The MOV has "knocked out" to neutral. The packer MOV plate is closed, and the carrier is up in the "home" position unless it was stopped short by the resistance of the compacted trash in the body.



Roller rests on opposite step



Check valve Oil jet



Port #2 Knock-out pivot

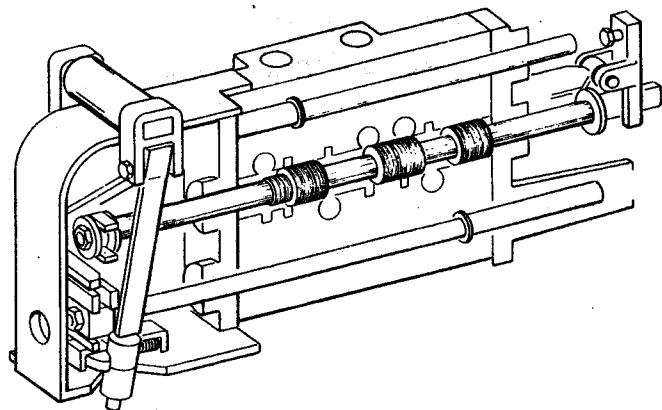
Knockout plunger

— MOV is in neutral

Rollers settle into bottom of "V"

## TROUBLESHOOTING THE MAIN OPERATING VALVE

Troubleshooting the Main Operating Valve (MOV) can be greatly simplified by carefully observing the valve at the time the malfunction occurs. Malfunctions can be caused by mechanical problems or by pressure related problems.



## PRELIMINARY CHECKS AND ADJUSTMENTS

### CYCLE TIME

The system cycle time is an indication of flow rate. The higher the flow rate the quicker the system pressure builds. The MOV is a pressure controlled valve and it will respond as system pressure dictates.

### SYSTEM MAIN RELIEF PRESSURE

The MOV will only react when sufficient pressure is present to extend the reversing plunger and the knockout plunger. If the main relief pressure is below 1400 psi the MOV will not knock out and if it is below 1200 psi the MOV will not reverse or knock out.

### CONTROL LINKAGE

Make sure the control linkage works freely. Binding linkage and packings that are too tight can cause the MOV to malfunction.

### OBVIOUS PROBLEMS

Remove the covers from the MOV and check for a broken spring, broken roller arms, broken pivot, or worn parts.

### OBSERVE MOV OPERATION

Operate the packer and classify the malfunction.

## TROUBLESHOOTING

**SEE FAULTY REVERSING FUNCTION IF:** The packer plate fully opens/closes, the carrier plate **does not move at all**.

**SEE EARLY REVERSE IF:** The packer plate **moves slightly** but does not complete the cycle, while the carrier plate moves and knocks out normally.

**SEE EARLY KNOCKOUT IF:** The packer plate completes a normal cycle, but the carrier plate **moves slightly** and will not complete the cycle.

**SEE FAULTY KNOCK OUT FUNCTION IF:** The packer plate opens/closes normally, and the carrier plate **moves completely** down/up, but the MOV does not knock out.  
Engine speed up stays on.



**TROUBLESHOOTING**

**EARLY REVERSE**

The MOV reverses too soon. This condition is caused by the hydraulic system reaching reversing pressure (1200 psi) too soon or by the MOV reversing at a

lower than normal pressure. This is caused by a weak or broken reversing spring.

POSSIBLE CAUSE	REMEDY
<ol style="list-style-type: none"> <li>1. Directional valves not shifting equally.</li> <li>2. Reverse flow check in the directional valve stuck.</li> <li>3. Bent or dented hydraulic tubes.</li> <li>4. Kinked or bad hose.</li> <li>5. Debris in the hydraulic circuit tubes, fittings, directional valves, etc.</li> <li>6. Blocked return line.</li> <li>7. Cycle time too fast.</li> <li>8. Binding packer plate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Synchronize directional valves.</li> <li>2. Disassemble and clean valve. See Section 9, Service &amp; Repair.</li> <li>3. Replace tubes.</li> <li>4. Replace hose.</li> <li>5. Clean system.</li> <li>6. Clean line.</li> <li>7. Adjust cycle time. See Section 7, Check-out.</li> <li>8. Free plate or shim. See Section 9, Service &amp; Repair.</li> </ol>

**NOTE**

*Only about 250-400 psi is needed to open the packer plate or move the carrier plate down. A broken reversing spring may work fine during the first half of the cycle, but cause early reversing in the second half. During the second half of the cycle the resistance of trash in the hopper causes an increase in system pressure.*

**FAULTY REVERSING FUNCTION**

The MOV will not reverse. This problem can be caused by low hydraulic pressure or a mechanical problem.

Low pressure: The reversing plunger requires at least 1200 psi to extend out of the Main Operating Valve body far enough to start the reversing function.

POSSIBLE CAUSE	REMEDY
<ol style="list-style-type: none"> <li>1. Bad pump.</li> <li>2. Main relief setting is too low.</li> <li>3. By-passing operating cylinder.</li> <li>4. By-passing packer directional valve.</li> <li>5. By-passing 2-spool valve.</li> <li>6. Torn gasket on MOV end plate.</li> <li>7. Slow pump speed.                         <ol style="list-style-type: none"> <li>a. Torque converter not turning fast enough to lock up.</li> <li>b. Clutch slipping.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Replace pump.</li> <li>2. Adjust relief valve. See Section 7, Check-out.</li> <li>3. Repack cylinder.</li> <li>4. Replace directional valve.</li> <li>5. Replace 2-spool valve.</li> <li>6. Replace gasket.</li> <li>7. Adjust cycle time. See Section 7, Check-out.                         <ol style="list-style-type: none"> <li>a. Install torque converter lockup.</li> <li>b. Replace clutch.</li> </ol> </li> </ol>

**THE MOV DOES NOT REVERSE AT ALL MECHANICAL PROBLEM**

POSSIBLE CAUSE	REMEDY
<ol style="list-style-type: none"> <li>1. Broken roller arm.</li> <li>2. Broken spring.</li> <li>3. Worn trip finger.</li> <li>4. Worn reversing finger.</li> <li>5. Worn lower roller arm.</li> <li>6. Broken reversing spring.</li> <li>7. Square block threaded completely into the end of the reversing plunger.</li> <li>8. Loose roller arms.</li> <li>9. Worn "V" steps on bridge.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace roller arm.</li> <li>2. Replace spring, See later in this section.</li> <li>3. Replace trip finger, See later in this section.</li> <li>4. Replace reversing finger, See later in this section.</li> <li>5. Replace arm, See later in this section.</li> <li>6. Replace spring, See later in this section.</li> <li>7. Adjust, see later in this section.</li>   <li>8. Peen or weld arm joint.</li> <li>9. Replace bridge.</li> </ol>

**NOTE**

*The reversing spring may break several times before the MOV quits reversing. The reversing plunger should always be spring loaded. If any free travel is felt when prying the reversing plunger into the MOV body then the spring is broken.*

**EARLY KNOCKOUT**

The MOV knocks out too soon. This condition has two (2) possible causes; the hydraulic system reaching knockout pressure too soon or the MOV knocking out at a lower than normal pressure.

POSSIBLE CAUSE	REMEDY
<b>SYSTEM PRESSURE BUILDS TOO QUICKLY</b>	
<ol style="list-style-type: none"> <li>1. Directional valves not shifting equally.</li> <li>2. Reverse flow check in the carrier directional valve stuck.</li> <li>3. Bent or dented hydraulic tubes.</li> <li>4. Kinked or bad hose.</li> <li>5. Debris in the hydraulic circuit tubes, fittings, directional valves, etc.</li> <li>6. Blocked return line.</li> <li>7. Cycle time too fast.</li> <li>8. Binding packer plate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Synchronize valves.</li> <li>2. Disassemble and clean valve. See Section 9, Service &amp; Repair.</li> <li>3. Replace tubes.</li> <li>4. Replace hose.</li> <li>5. Clean system.</li>   <li>6. Clean line.</li> <li>7. Adjust cycle time. See Section 7, Check-out.</li> <li>8. Free plate or shim. See Section 9, Service &amp; Repair.</li> </ol>
<b>THE MOV KNOCKS OUT AT A LOWER THAN NORMAL PRESSURE</b>	
<ol style="list-style-type: none"> <li>1. Weak knockout spring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace spring, see later in this section.</li> </ol>



## TROUBLESHOOTING

### FAULTY KNOCKOUT FUNCTION

The MOV will not knock out. This problem can be caused by low pressure or a mechanical problem.

Low pressure: The knockout plunger requires at least 1400 psi to extend out of the Main Operating Valve body far enough to rotate the knockout pivot and bump the main spool into neutral.

POSSIBLE CAUSE	REMEDY
<ol style="list-style-type: none"> <li>1. Main relief setting is low.</li> <li>2. Bad pump.</li> <li>3. By-passing operating cylinder.</li> <li>4. By-passing carrier directional valve.</li> <li>5. By-passing 2-spool valve.</li> <li>6. Torn gasket on MOV end plate bridge end.</li> <li>7. Slow pump speed.               <ol style="list-style-type: none"> <li>a. Torque converter not turning fast enough to lock up.</li> <li>b. Clutch slipping.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust main relief, see Section 7, Check-out.</li> <li>2. Replace pump.</li> <li>3. Repack cylinder.</li> <li>4. Replace directional valve.</li> <li>5. Replace 2-spool valve.</li> <li>6. Replace gasket.</li> <li>7. Adjust cycle time. See Section 7, Check-out.               <ol style="list-style-type: none"> <li>a. Install torque converter lockup.</li> <li>b. Replace clutch.</li> </ol> </li> </ol>

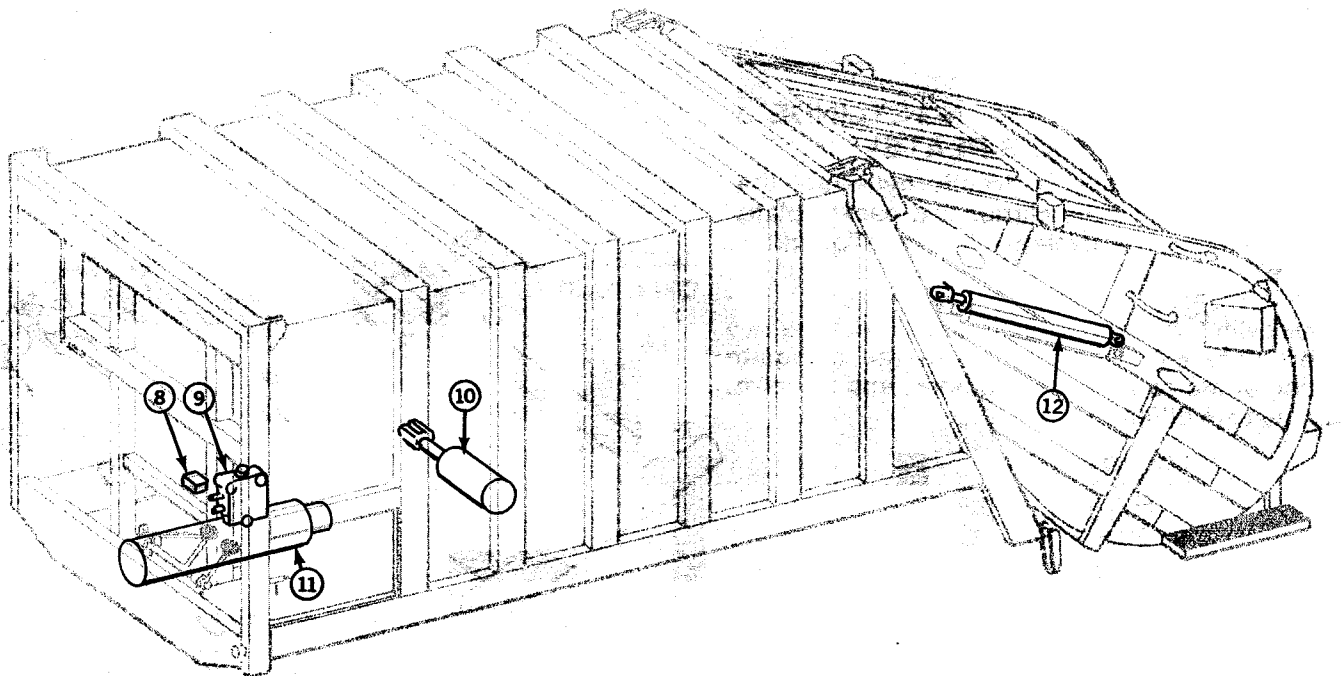
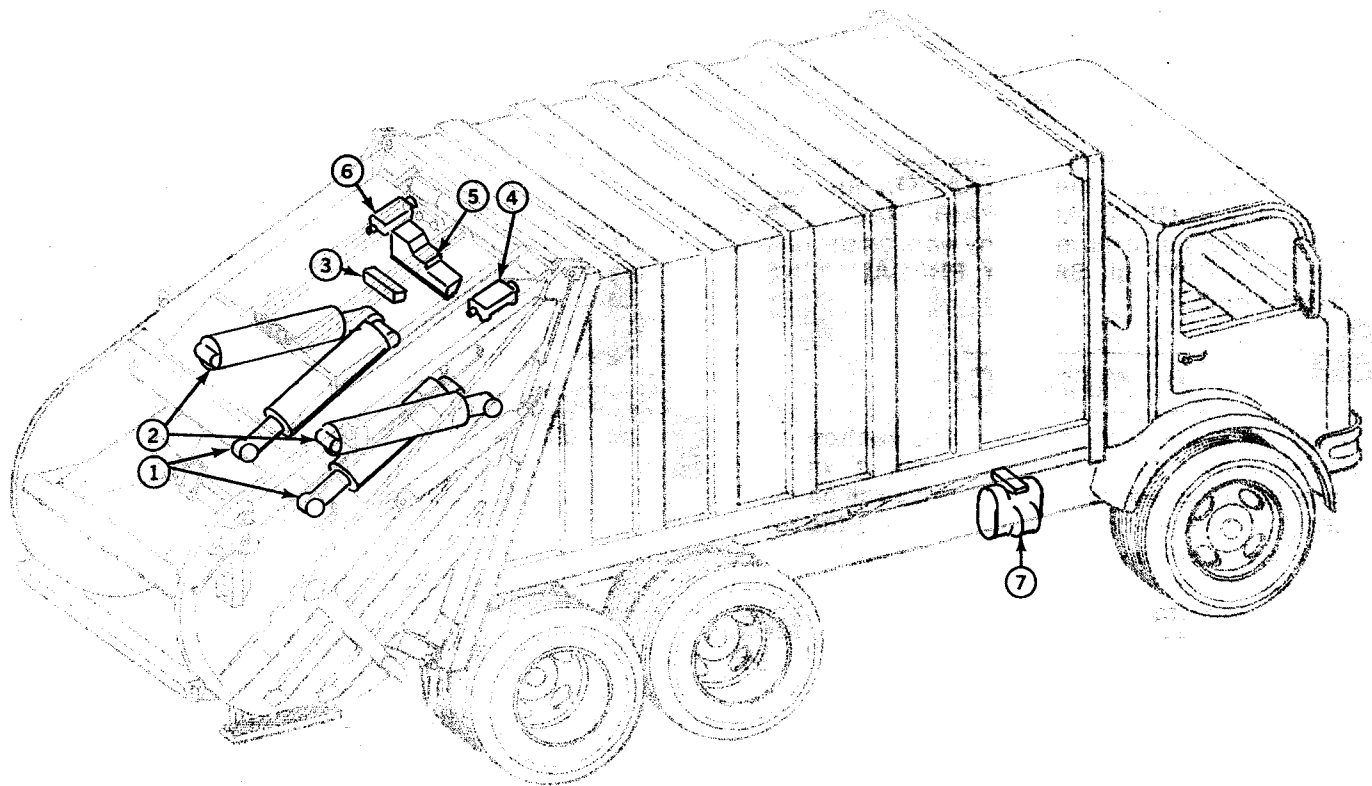
### MECHANICAL PROBLEMS

Broken parts in the bridge assembly, or binding linkage may cause the valve to malfunction.

POSSIBLE CAUSE	REMEDY
<ol style="list-style-type: none"> <li>1. Broken knockout spring.</li> <li>2. Bent or broken knockout pivot.</li> <li>3. Trip finger improperly adjusted (on bridge assembly).</li> <li>4. Binding linkage.</li> <li>5. Binding bridge assembly.</li> <li>6. Tight packings.</li> <li>7. Trip finger not resetting (weak or broken reversing spring).</li> <li>8. Broken collar on main spool.</li> <li>9. Loose or stretched capscrews on knockout pivot.</li> <li>10. Insufficient clearance between knockout pivot adjusting bolt &amp; knockout plunger. (1/32" min.)</li> <li>11. Knockout pivot improperly adjusted.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace spring.</li> <li>2. Replace pivot.</li> <li>3. Adjust pivot. Replace trip finger.</li> <li>4. Free linkage.</li> <li>5. Replace or free bridge.</li> <li>6. Completely remove and reinstall packings.</li> <li>7. Replace reversing spring.</li> <li>8. Replace spool.</li> <li>9. Replace capscrews.</li> <li>10. Adjust knockout pivot.</li> <li>11. Adjust knockout pivot.</li> </ol>



## MAIN COMPONENT LOCATION



1. PACKER PLATE OPERATING CYLINDER
2. CARRIER PLATE OPERATING CYLINDER
3. 3000 LB. RELIEF VALVE
4. CARRIER PLATE SINGLE-SPOOL DIRECTIONAL VALVE
5. MAIN OPERATING VALVE
6. PACKER PLATE SINGLE-SPOOL DIRECTIONAL VALVE

7. HYDRAULIC PUMP
8. SEQUENCE PILOT CHECK VALVE
9. 2-SPOOL DIRECTIONAL VALVE
10. CLAMP CYLINDER
11. PUSHOUT CYLINDER
12. TAILGATE LIFT CYLINDER

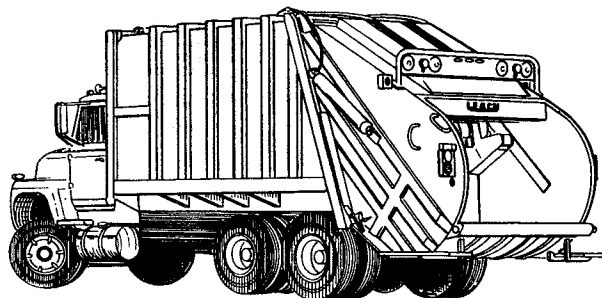
**SERVICE AND REPAIR****GENERAL**

This section contains all the instructions necessary for the repair and replacement of the main components of the 2R11 Packmaster.

Before attempting any repair of the unit, become thoroughly familiar with the OPERATION instructions (Sec. 3) and GENERAL REPAIR PRACTICES (Sec. 4). Also, before performing any work on the unit know and OBSERVE all SAFETY PRECAUTIONS listed in Section 2.

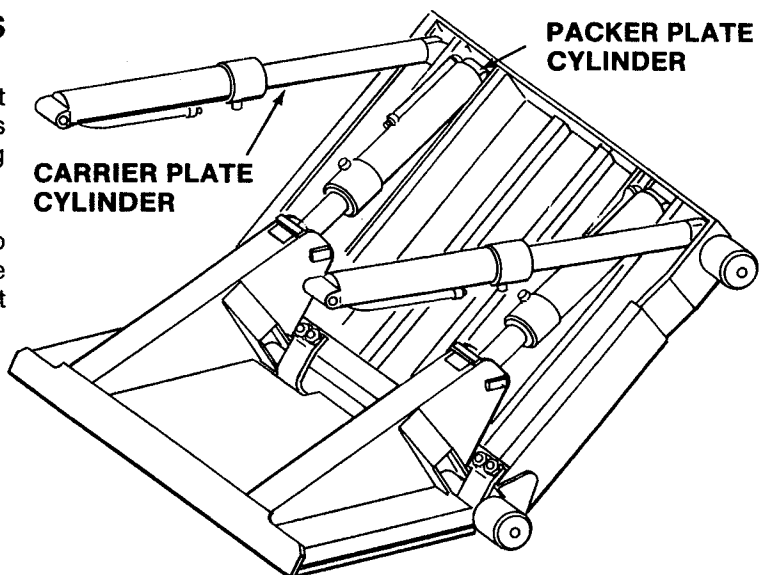
**▲WARNING**

There are some procedures in this section that will require that the truck is running. In these instances the operational status will be indicated. Otherwise, make sure that the truck is shut off and the keys are removed. The pressure of the hydraulic system and resulting movement of unit parts can cause serious injury or death.

**DESCRIPTION OF OPERATING CYLINDERS (CARRIER AND PACKER PLATE)**

The four double-acting hydraulic cylinders that control movement of the carrier and packer plates during the compaction cycle are called the "operating cylinders".

All four cylinders are the same except that the two packer plate cylinders mount in the opposite direction of the carrier plate cylinders and the pivot mountings are different.

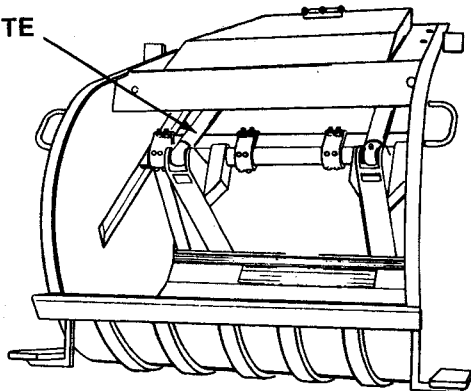


**TEST FOR LEAKING PACKER PLATE CYLINDERS**

**NOTE**

Before testing any cylinder, make sure main line pressure is at 1650 PSI as described under MAIN LINE PRESSURE CHECK, Sec. 7, CHECKOUT PROCEDURES

PACKER PLATE CYLINDER



**Operational Status**

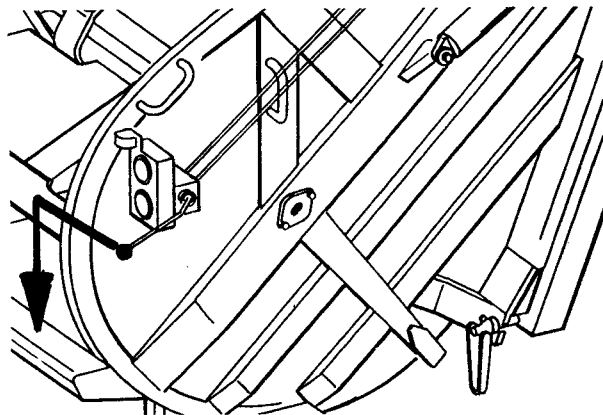
Truck	Off	Keys	Removed
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1. Remove main topsheets over operating cylinders for better accessibility during testing.

**Operational Status**

Truck	Running	PTO	Engaged	Sol. Sw.	ON
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2. Shift packing lever (in and down) to fully extend packer plate cylinders.

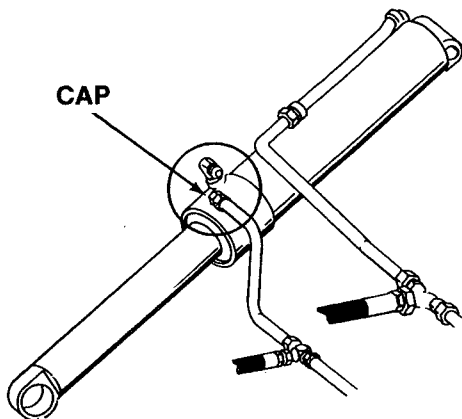


**Operational Status**

Truck	Off	Keys	Removed
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3. Disconnect and cap lines to the rod end of one cylinder at a time.

CAP

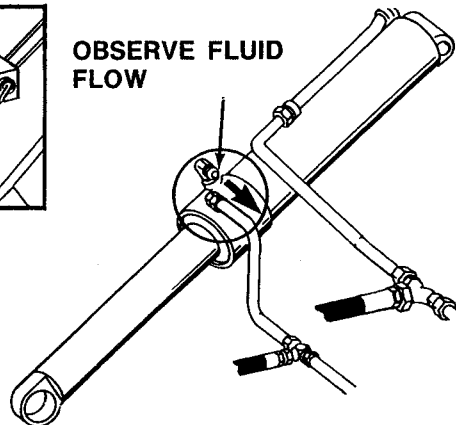
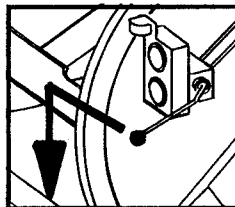


**Operational Status**

Truck	Running	PTO	Engaged	Sol. Sw.	ON
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4. Shift packing lever (in and down) to apply hydraulic pressure to the large end of the packer plate cylinders. Hold lever and observe fluid flow from open port on rod end. The flow of hydraulic fluid should be no more than 12 fluid ounces per minute. A flow greater than 12 ounces indicates an excessive piston seal leak. If cylinder does not leak excessively, continue test.

OBSERVE FLUID FLOW



## SERVICE AND REPAIR

### Operational Status

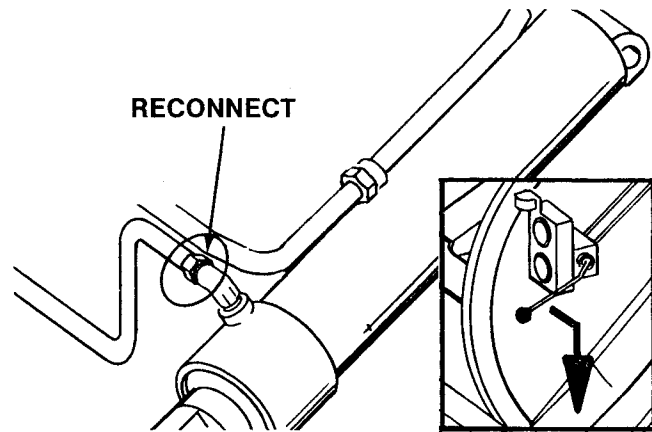
Truck	Off	Keys	Removed
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5. Reconnect hydraulic lines to the rod end of cylinders. Repeat steps 3 - 5 for other cylinder.

### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
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6. Shift packing lever (out and down) to retract packer plate cylinder (to the "interrupted-cycle" position).



### Operational Status

Truck	Off	Keys	Removed
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7. Disconnect and cap hydraulic lines which connect to the large end of the packer plate cylinder.

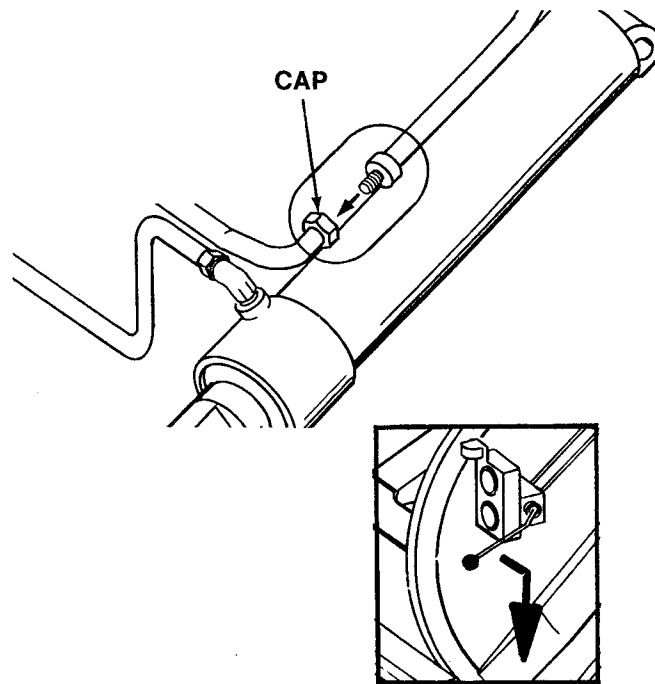
### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
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8. Shift lever (out and down) to apply hydraulic pressure to the rod end of the packer plate cylinder. Hold lever and observe fluid flow from port on large end of cylinder.

The flow of hydraulic fluid should be no more than 12 fluid ounces per minute. A flow greater than 12 ounces indicates an excessive piston seal leak. Disassemble cylinder and replace piston seal as described later in this section.

9. If the cylinder does not leak, reconnect hydraulic lines to the cylinder.



### CAUTION

Loosen the hydraulic fittings slowly to release any trapped pressure. Watch for inadvertent movement of components.

Repeat steps 7 - 9 for other cylinder.

## TEST FOR LEAKING CARRIER PLATE CYLINDERS

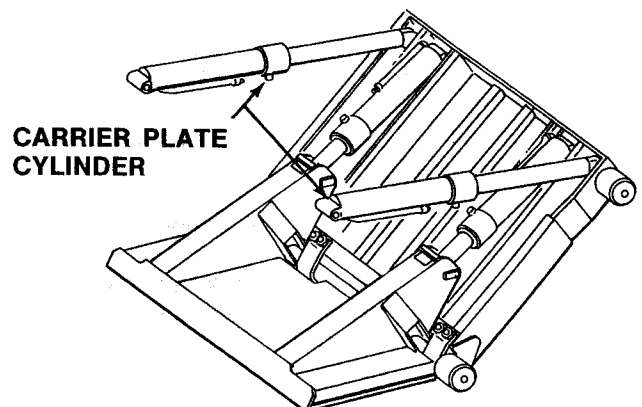
### NOTE

Before testing any cylinder, make sure main line pressure is at 1650 PSI as described under MAIN LINE PRESSURE CHECK, Sec. 7, CHECKOUT PROCEDURES.

### Operational Status

Truck	Off	Keys	Removed
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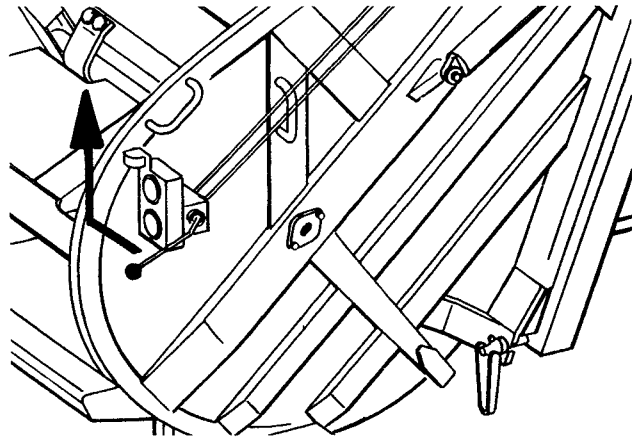
1. Remove topsheet over operating cylinders for better accessibility during testing.



**Operational Status**

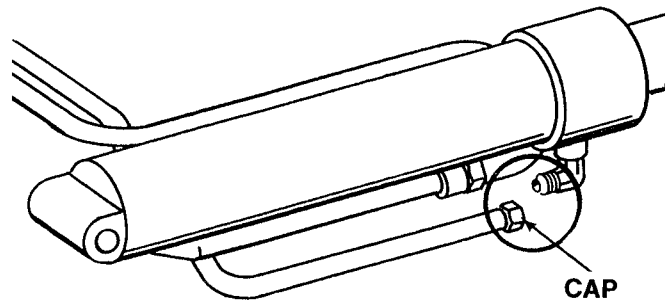
Truck	Running	PTO	Engaged	Sol. Sw.	On
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2. Shift packing lever (in and up) to fully extend carrier plate cylinders (to home position).

**Operational Status**

Truck	Off	Keys	Removed
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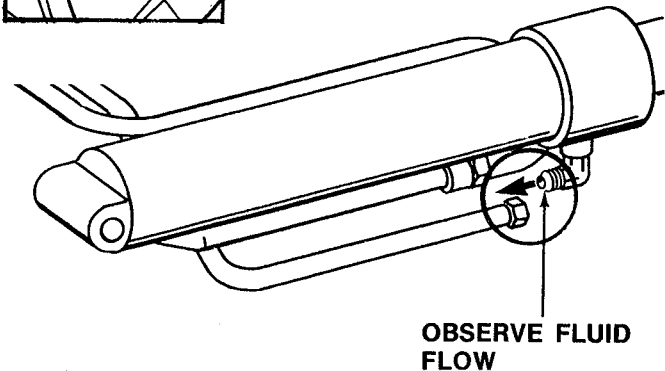
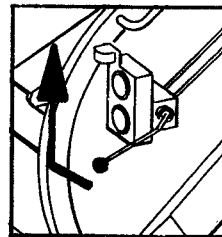
3. Disconnect and cap line that connects to the rod end of one cylinder at a time.

**Operational Status**

Truck	Running	PTO	Engaged	Sol. Sw.	On
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4. Shift packing lever (in and up) to apply hydraulic pressure to the large end of the carrier cylinders. Hold lever and observe fluid flow from open port on rod end.

The flow of hydraulic fluid should be no more than 12 fluid ounces per minute. A flow greater than 12 ounces indicates an excessive piston seal leak. If cylinder does not leak excessively, continue test.

**Operational Status**

Truck	Off	Keys	Removed
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5. If cylinder does not leak reconnect hydraulic lines to the rod end of cylinder.

**CAUTION**

Loosen the hydraulic fittings slowly to release any trapped pressure. Watch for inadvertent movement of components.

Repeat steps 3 - 5 for other cylinder.

## SERVICE AND REPAIR

### Operational Status

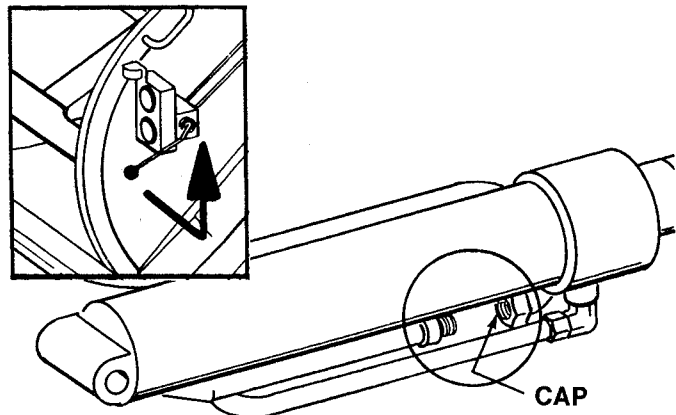
Truck	Running	PTO	Engaged	Sol. Sw.	On
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- Shift packing lever (out and up) to retract carrier plate cylinder.

### Operational Status

Truck	Off	Keys	Removed
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- Disconnect and cap hydraulic lines which connect to the large end of carrier plate cylinder.

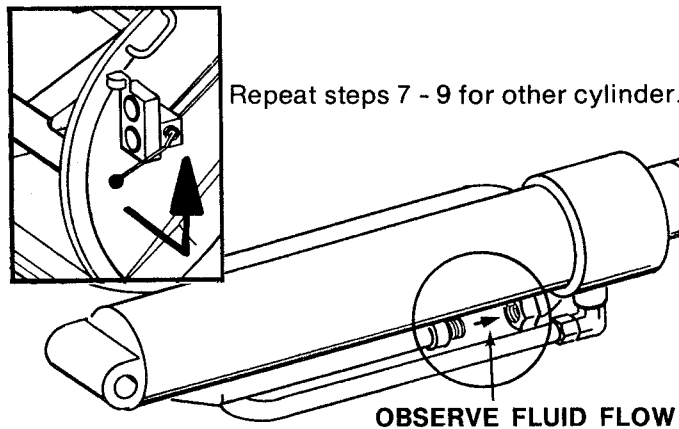


### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
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- Shift lever (out and up) to apply hydraulic pressure to the rod end of the carrier cylinder. Hold lever and observe fluid flow from port on cylinder end. The flow of hydraulic fluid should be no more than 12 fluid ounces per minute. A flow greater than 12 ounces indicates an excessive piston seal leak. Disassemble cylinder and replace piston seal as described later in this section.

- If cylinder does not leak, reconnect hydraulic lines to the large end of carrier plate cylinder.



Repeat steps 7 - 9 for other cylinder.

OBSERVE FLUID FLOW

## REMOVAL OF PACKER PLATE CYLINDERS

### Operational Status

Truck	Off	Keys	Removed
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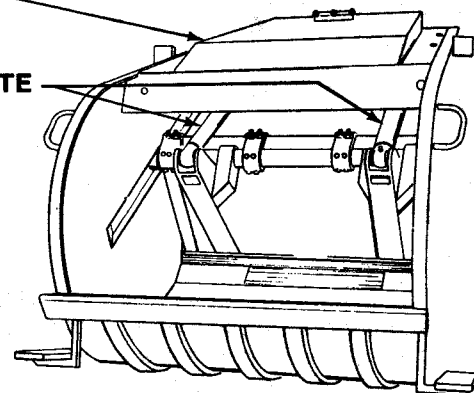
- Remove topsheets to provide better accessibility to packer plate.

### NOTE

See Sec. 4. GENERAL REPAIR PRACTICES, for more detailed information about the correct use of slings and lifting chains.

TOPSHEETS

PACKER PLATE CYLINDER

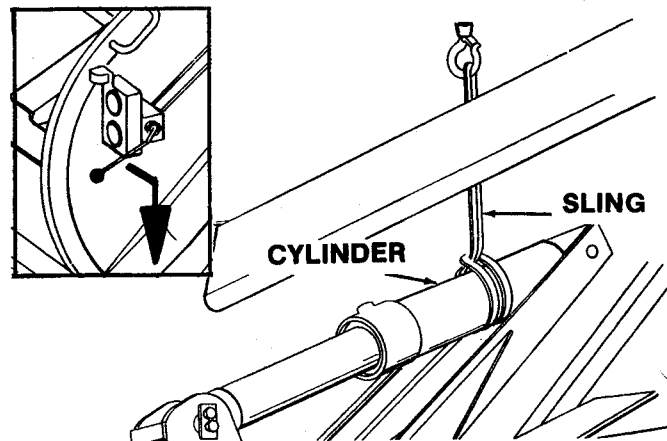


- Secure a nylon sling around cylinder as shown and attach to a suitable lifting device with a capacity of 500 lbs. Operate hoist to make lifting cable snug without applying strain on cylinder.

### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
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- Shift packing lever (out and down) to partially retract the packer plate cylinders. Disengage lever when plate is vertical. This relieves the weight of the plate from the cylinder rod end.



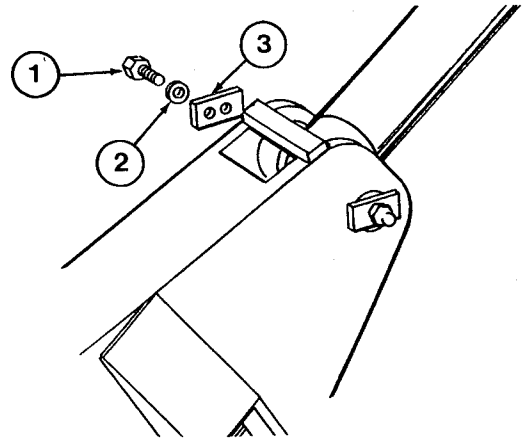
SLING

CYLINDER

**SERVICE AND REPAIR**

**Operational Status**

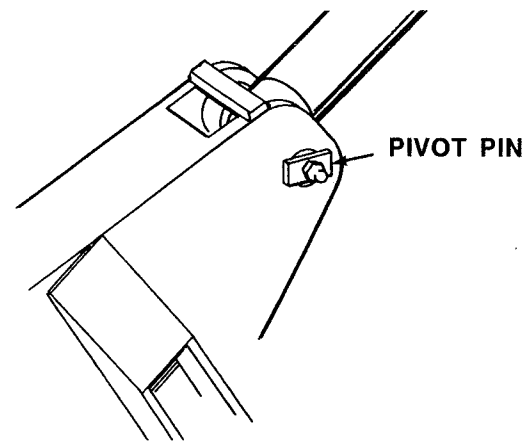
Truck	Off	Keys	Removed
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4. Remove capscrews (1), lockwashers (2) and pivot pin cover (3) from rod end.

**Operational Status**

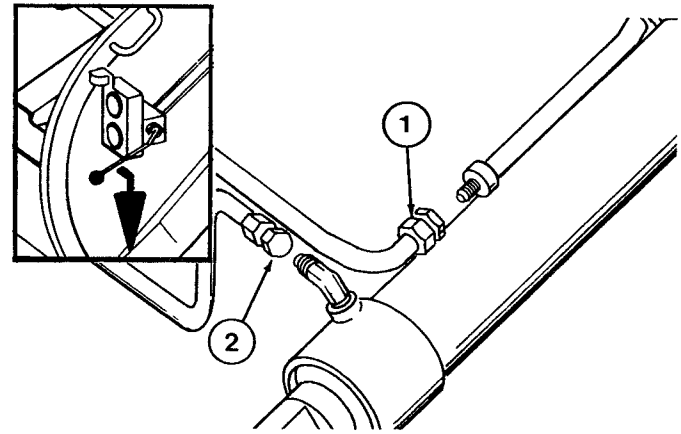
Truck	Off	Keys	Removed
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5. Make sure cylinder weight is securely supported by hoist and carefully remove pivot pin.

**Operational Status**

Truck	Running	PTO	Engaged	Sol. Sw.	On
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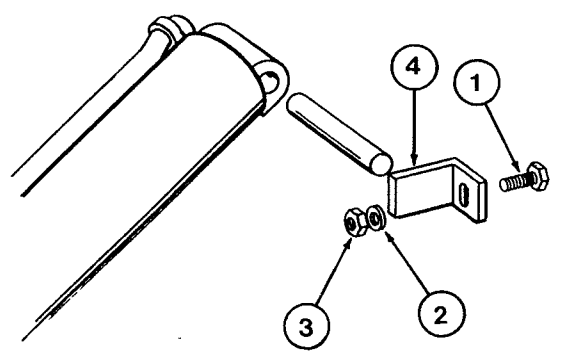
6. Shift packing lever (out and down) to completely retract cylinder.

**Operational Status**

Truck	Off	Keys	Removed
-------	-----	------	---------

7. Disconnect both the large end (1) and rod end (2) pressure tube. Immediately cap or plug pressure tubes and cylinder ports to keep fluid in, and dirt out.

8. Remove capscrew (1), lockwashers (2) and nuts (3) securing pivot pin retainer (4) and remove retainer.



9. Remove pivot pin by using special packer pin puller (See Sec. 11 SERVICE TOOLS).

10. Check for bent pivot pins and inspect pin hubs for broken welds and elongated holes.



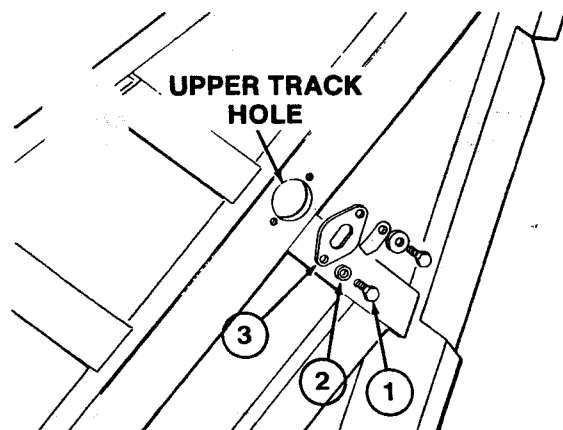
## SERVICE AND REPAIR

### REMOVAL OF CARRIER PLATE CYLINDERS

#### Operational Status

Truck	Off	Keys	Removed
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1. Remove topsheets, to provide better accessibility. Remove two capscrews (1) and lockwashers (2) securing upper track hole covers (3) and remove upper covers from each side of the tailgate.



#### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
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2. Shift packing lever and cycle unit until the roller assembly on the upper end of the carrier plate is in line with the open upper track hole.

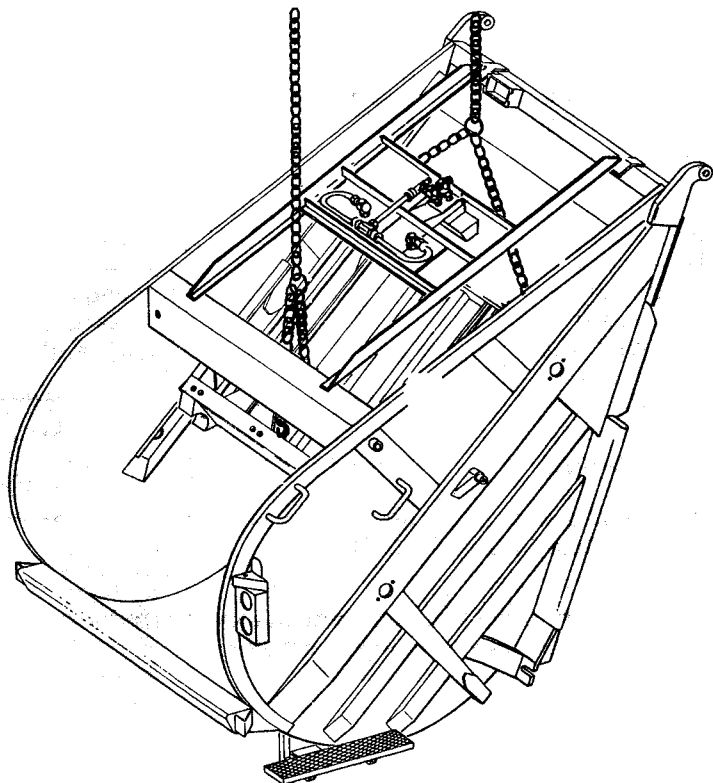
#### Operational Status

Truck	Off	Keys	Removed
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#### NOTE

See Sec. 4, GENERAL REPAIR PRACTICES, for more detailed information about the correct use of slings and lifting chains.

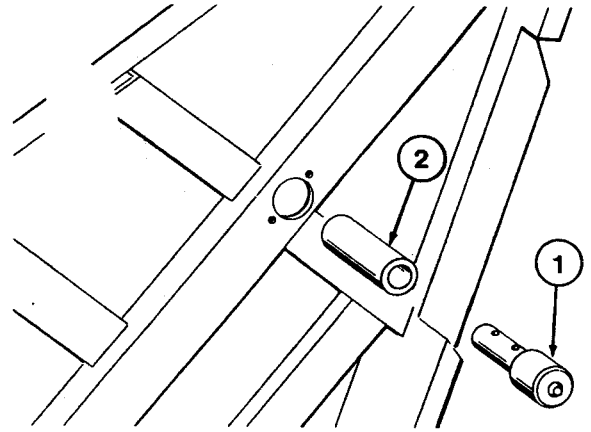
3. Secure chains or a sling to the upper and lower end of the carrier plate. Attach the other end to a suitable lifting device with a minimum lifting capacity of 1,600 lbs. Adjust the hoist so that it will support the plate once the roller assembly and pivot pin are removed but not so tight that it changes the position of the carrier plate.



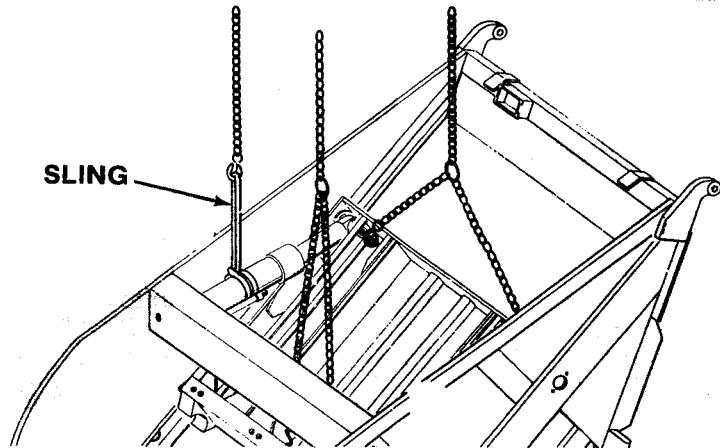


**SERVICE AND REPAIR**

4. Once the carrier plate has been securely supported, remove the roller assemblies (1) from each side of the tailgate through the open upper track holes. Remove roller shaft bushings (2).

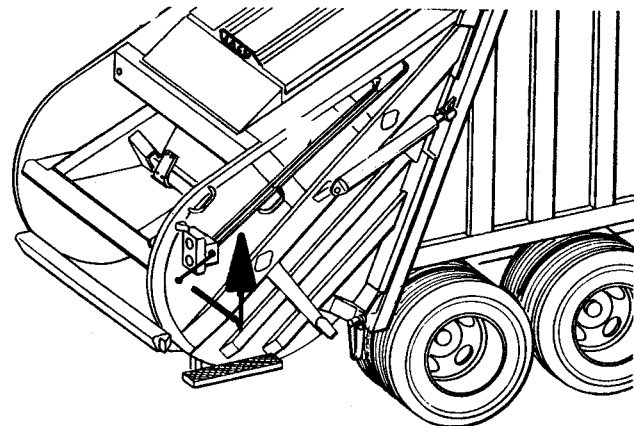


5. Secure a nylon sling around cylinder and attach to a lifting device with a lifting capacity of 500 lbs. Operate hoist to make lifting cable snug without applying strain to cylinder.



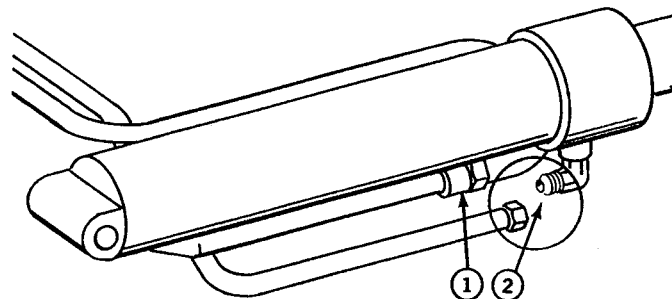
Operational Status				
Truck	Running	PTO	Engaged	Sol. Sw. On

6. Slowly operate packing lever (out and up) to completely retract carrier cylinder piston rod. This will provide enough clearance to remove cylinder.



Operational Status			
Truck	Off	Keys	Removed

7. Disconnect both case end (1) and rod end (2) pressure tubes from carrier cylinder. Immediately plug pressure tubes and cap cylinder ports to keep fluid in and dirt out.



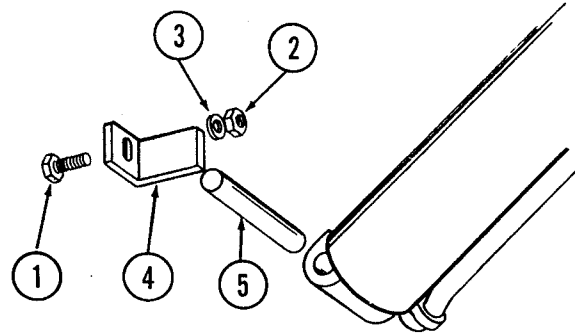
## SECTION 9

### SERVICE AND REPAIR

8. Remove capscrew (1), nut (2) and lockwashers (3) securing the cylinder pivot pin retainer (4) and remove retainer.
9. Carefully remove pivot pin (5) and lift out the cylinder assembly.
10. Check for bent pivot pins and inspect pin hubs for broken welds and oblongated holes.

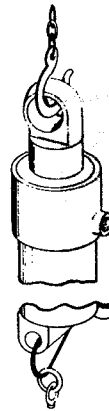
#### NOTE

*If cylinder is not to be installed immediately, keep ports sealed to prevent dirt from entering cylinder.*

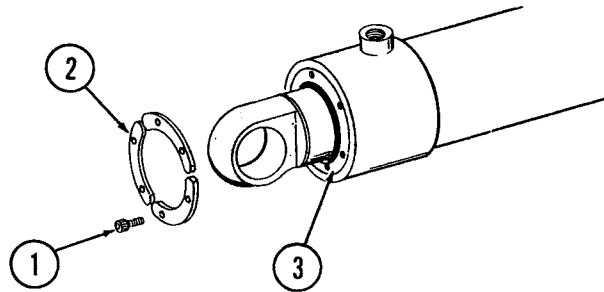


### DISASSEMBLY OF OPERATING CYLINDERS

1. Remove grease fittings, clean parts, drain fluid and follow all other applicable guidelines for disassembly provided in Sec. 4, GENERAL REPAIR PRACTICES before proceeding to disassemble cylinder
2. Secure the case end of the operating cylinder to the floor or workbench.
3. Secure the rod end of the cylinder to an overhead hoist or other suitable lifting mechanism with a minimum lifting capacity of 500 lbs.

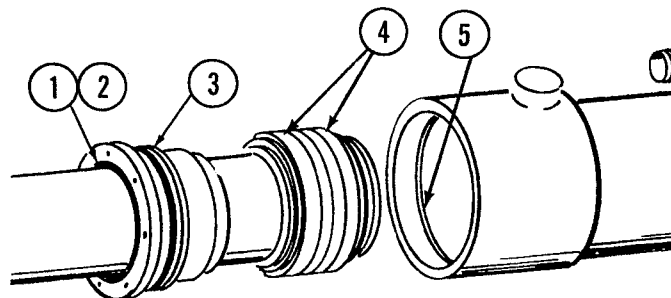


4. Remove the six nylock screws (1) and three lock segments (2) securing the head gland (3) to the cylinder.
5. Slowly operate the hoist to carefully pull the piston rod assembly out of the cylinder.
6. Disassemble cylinder parts and install replacement parts.



### INSPECTION AND REPLACEMENT OF OPERATING CYLINDERS

1. Carefully and thoroughly inspect the inside of the cylinder for cracks, scoring or uneven wear. Check all parts for damage.
2. Use an electric drill with an internal grinding wheel to remove burrs from the internal groove on the cylinder case (5).
3. A new rod wiper (1), rod seal (2), o-ring (3) and u-cups (4) must be installed anytime the cylinder is disassembled. Pay particular attention to the way parts are positioned for correct assembly. Parts that must be replaced together are available as a Repair Kit from your dealer.

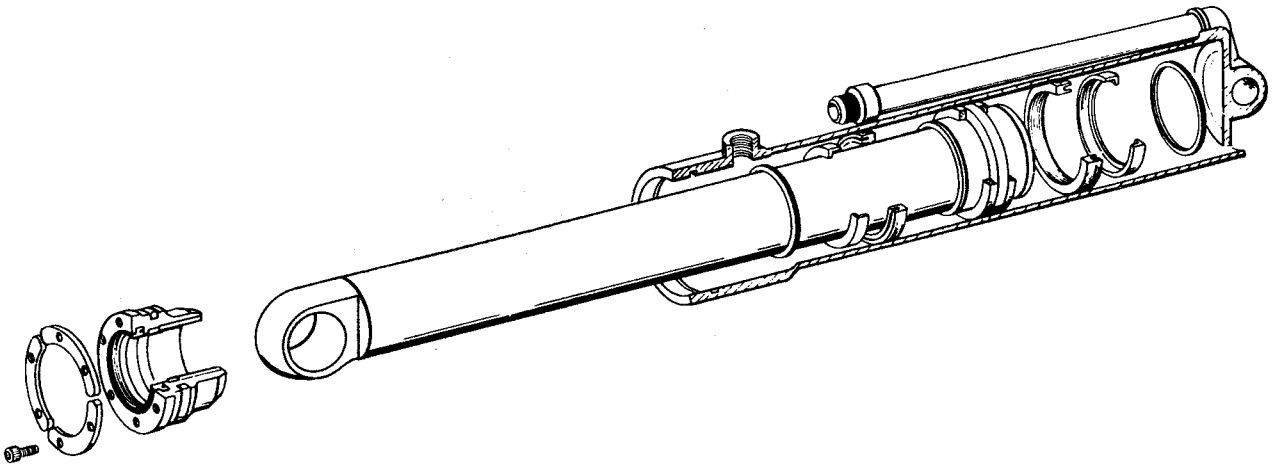


## REASSEMBLY AND INSTALLATION OF OPERATING CYLINDERS

Reassemble and install operating cylinders in approximate reverse order of disassembly.

### NOTE

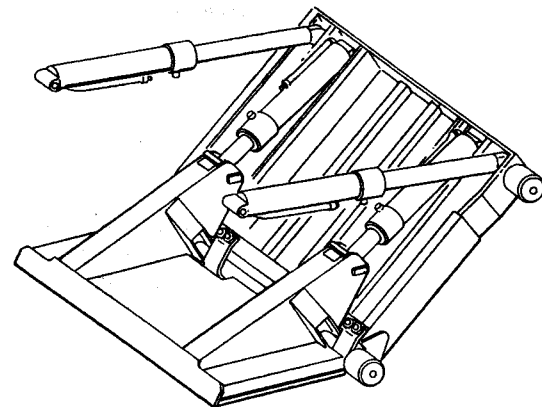
The special u-cup guide listed in Sec. 11, SERVICE TOOLS, must be used to start the piston rod into the cylinder for reassembly.



## DESCRIPTION OF PACKER PLATE

The packer plate works in conjunction with the carrier plate and four operating cylinders to make up the compaction mechanism. The packer plate is hinged to the carrier plate and controlled by the operating cylinders. Rollers supporting the two plates move along a track inside the tailgate.

The packer plate sweeps forward through the hopper picking up the refuse and together with the carrier plate move the refuse forward into the body where it is compacted against the pushout plate.



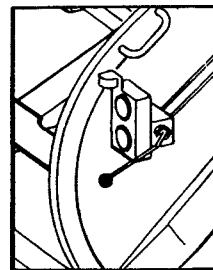
## BEARING REPLACEMENT

### Operational Status

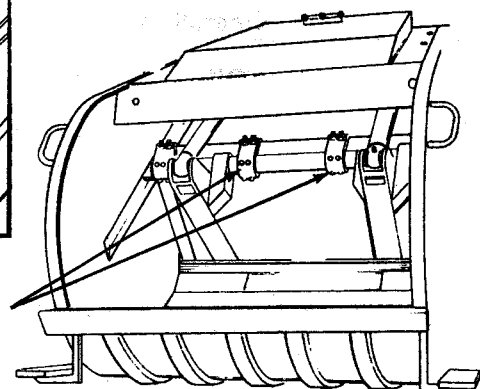
Truck Running	PTO Engaged	Sol. Sw.	On

- Engage packing lever (in and down) to fully extend packer plate cylinders and put the plate into the "Home Position."

- Raise tailgate and support for access to bearing thru-Bolts.



**INSIDE  
BEARING  
HOUSING**



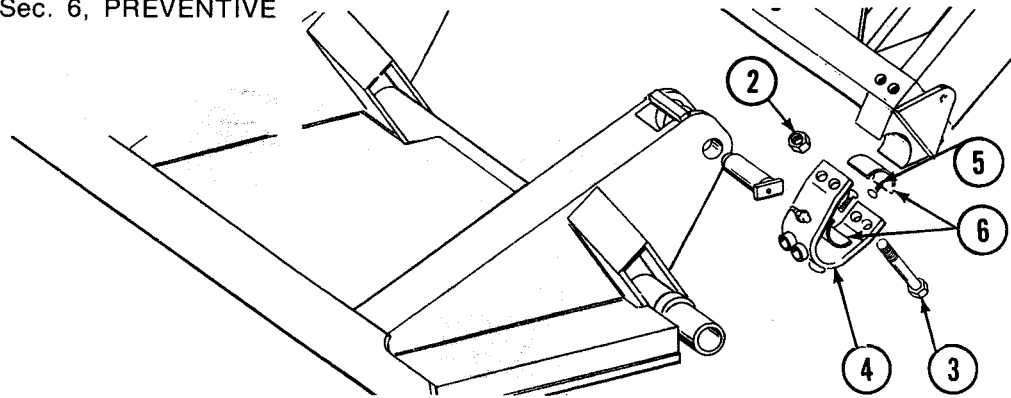
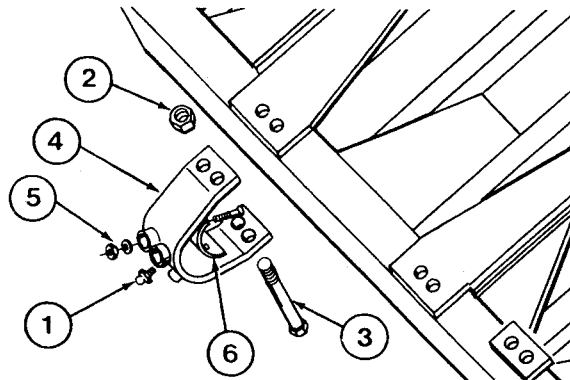
# SECTION 9

## SERVICE AND REPAIR

### Operational Status

Truck	Off	Keys	Removed
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3. Remove grease fitting (1).
4. Remove lock nuts (2) and thru-bolts (3).
5. Remove bearing housing (4).
6. Inspect bearing surface for excessive or uneven wear, scoring or other damage.
7. Remove attaching hardware (5) and bearing (6).
8. Replace a worn bearing and secure to bearing housing with attaching hardware.
9. Install bearing housing over packer plate tube and secure to carrier plate channel with thru-bolts, shims and locknuts.
10. Install grease fitting and lubricate as described in LUBRICATION CHART, Sec. 6, PREVENTIVE MAINTENANCE.

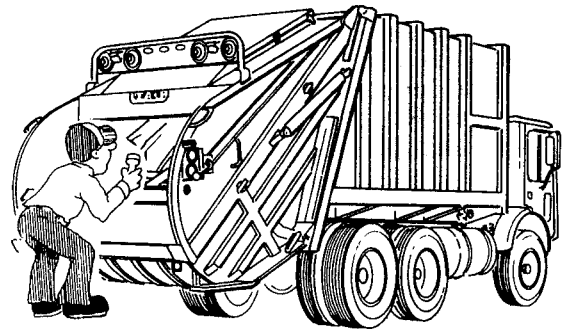


## ROLLER REPLACEMENT/SHIMMING

### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
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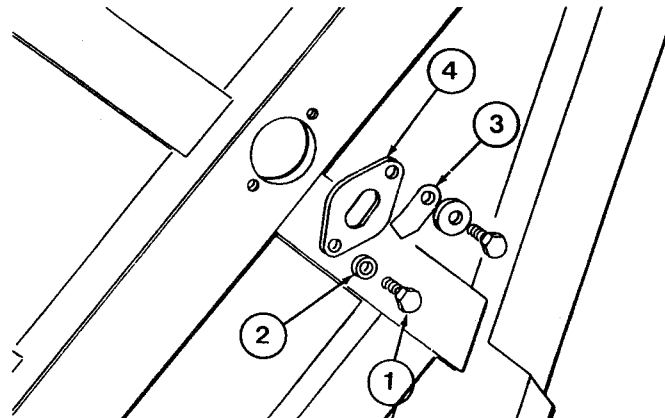
1. Shift the packing lever and cycle the unit several times while observing the rollers and action of packer and carrier plates. Watch for sideway movement or twisting to determine where shimming and/or new rollers may be needed.



### Operational Status

Truck	Off	Keys	Removed
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2. Remove capscrews (1), lockwashers (2), covers (3) and cover weldments (4) for both upper and lower track holes on each side of the tailgate.



**SERVICE AND REPAIR**

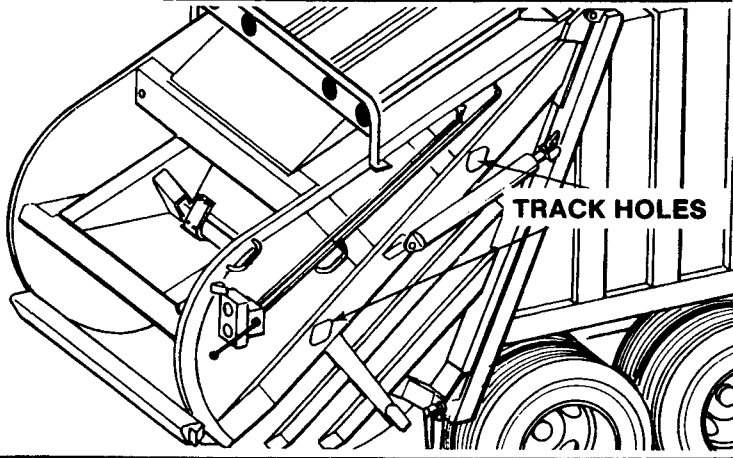
Operational Status				
Truck	Running	PTO	Engaged	Sol. Sw. On

- Shift the packer lever and cycle the plates as necessary to align the upper and lower roller assemblies with the track holes.

**NOTES**

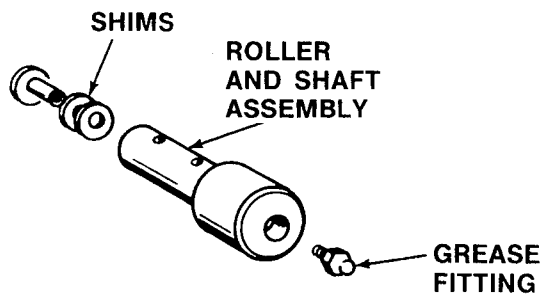
*If top roller is removed, first place a wedge between carrier plate and partition sheet to take weight off of roller assemblies.*

*If bottom roller is removed, support carrier and packer plate assembly before removing roller.*



Operational Status			
Truck	Off	Keys	Removed

- Remove one roller and shaft assembly at a time.
- Replace any roller that is excessively worn, cracked or out of round. Inspect condition of track bar.
- Install rollers with grease fittings and original shims or same amount of new shims.



Operational Status				
Truck	Running	PTO	Engaged	Sol. Sw. On

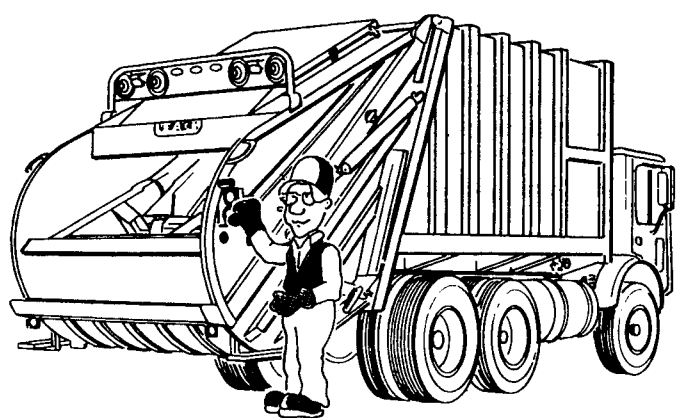
- Repeat step 1. to determine if additional shims are required.

**CAUTION**

**Do not over shim rollers. Excessive shimming may damage tailgate walls or wear track channels.**

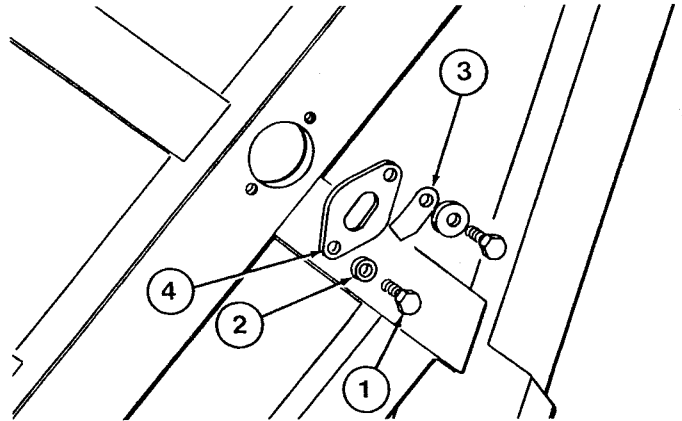
Operational Status			
Truck	Off	Keys	Removed

- Remove appropriate rollers and add shims as required to obtain a smooth operation of packer and carrier plate. (This may require adding or removing shims and operating packing lever several times until correct alignment is achieved.)
- Once alignment is correct, lubricate each roller as described in the LUBRICATION CHART, Sec. 6, PREVENTIVE MAINTENANCE.



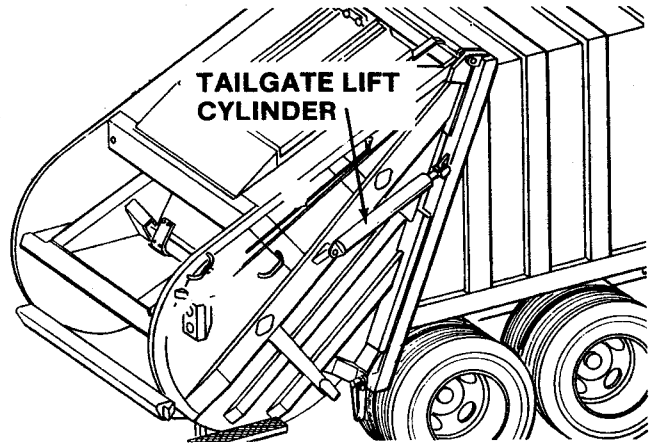
## SERVICE AND REPAIR

10. Using capscrews (1) and lockwashers (2) secure covers (3) and cover weldment (4) over the four track holes.



### DESCRIPTION OF TAILGATE LIFT CYLINDERS

These two hydraulically operated cylinders, mounted on each side of the tailgate, lift and lower the tailgate assembly. The rod end is pinned to a pivot ear on the body frame near the discharge opening, while the cylinder weldment pivot ear is bolted to a mounting hub on the tailgate.



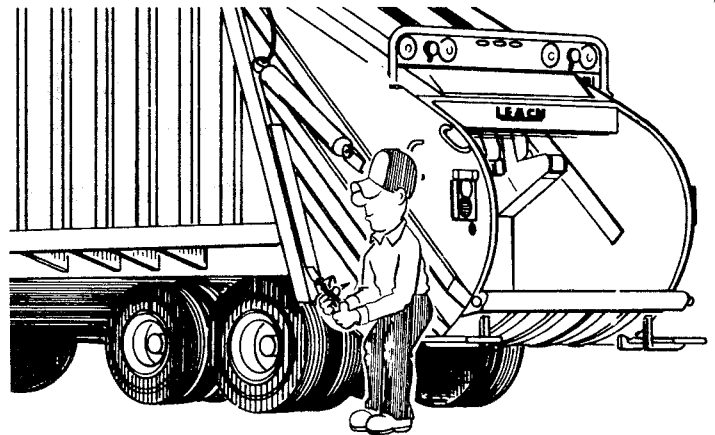
### TEST FOR LEAKING TAILGATE CYLINDER

**NOTE**

*This check will require two people.*

Operational Status			
Truck	Off	Keys	Removed

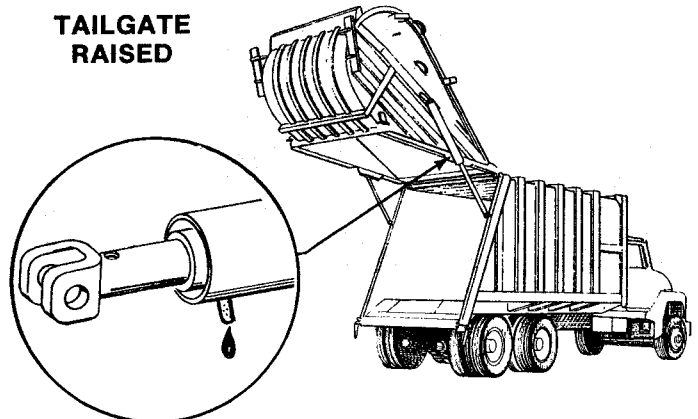
1. Loosen and release (swing away) tailgate clamps.



Operational Status			
Truck	Running	PTO	Engaged
Sol. Sw.			On

2. Depress speed-up button and pull tailgate lift lever to raise tailgate and hold.
3. (Second person) Observe breather in both cylinders for fluid leakage. A slight leak that soon stops is not critical. A steady leak requires new piston cups—proceed to tailgate cylinder removal and disassembly.

#### TAILGATE RAISED



## REMOVAL TAILGATE LIFT CYLINDERS

## Operational Status

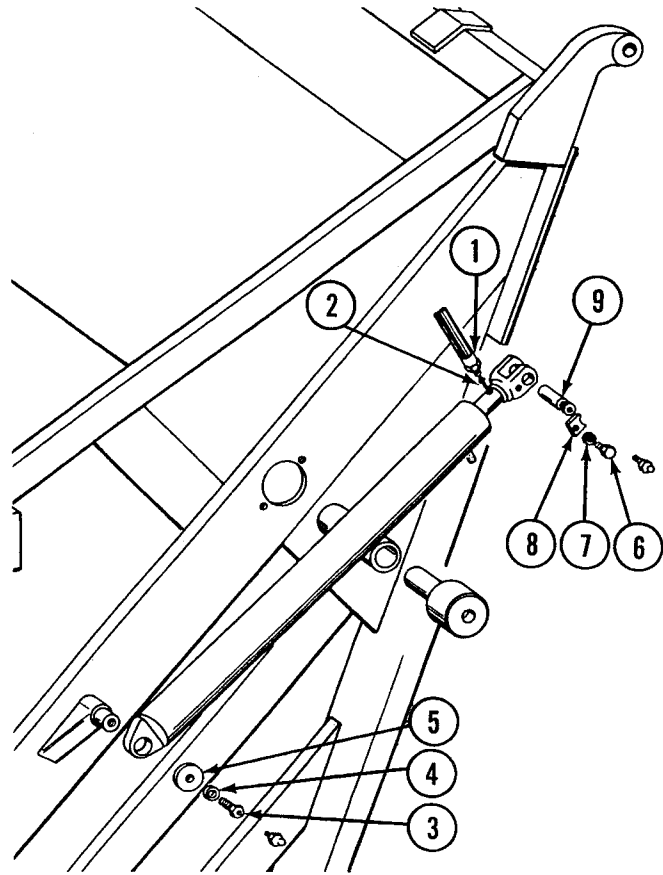
Truck	Off	Keys	Removed

1. With tailgate closed attach a sling connected to a suitable lifting device with a capacity of 500 lbs., to the tailgate lift cylinder.

**NOTE**

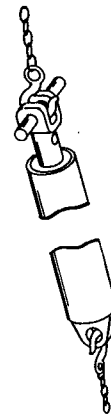
See Sec. 4, GENERAL REPAIR PRACTICES, for more detailed information about the correct use of slings and lifting chains.

2. Disconnect hydraulic line (1) at the cylinder port in piston rod, and cap line.
3. Remove restriction pin (2) and plug cylinder port.
4. Remove bolt (3), washer (4) and cover (5) from the cylinder end.
5. Remove capscrew (6), lockwashers (7), cover (8) and pin (9).

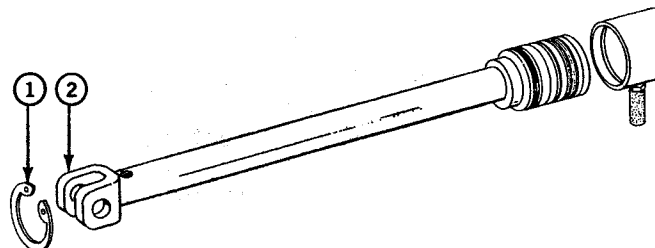


## DISASSEMBLY OF TAILGATE CYLINDER

1. Secure the case end of the cylinder to a workbench or floor mount and the rod end to an overhead lifting device with a minimum lift capacity of 500 lbs. to ease the disassembly of parts.
2. Wash mounting hardware and outside of cylinder assembly to prevent dirt and foreign matter from contaminating cylinder components during disassembly.
3. Remove plug from port and drain fluid.



4. Remove snap ring (1) and slide rod assembly (2) out of cylinder case.

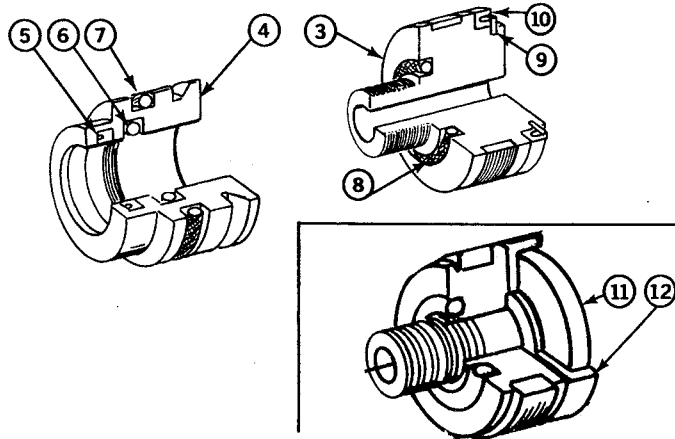


## SERVICE AND REPAIR

5. Unscrew the piston disc (3) from the rod and remove head gland (4).
6. Remove and discard rod seal (5), o-ring (6), o-ring (7), o-ring (8), retaining ring (9), and u-cup (10).

**NOTE**

On earlier units (insert) remove cup holder (11) and then u-cup (12).



### INSPECTION AND REPLACEMENT OF TAILGATE CYLINDER

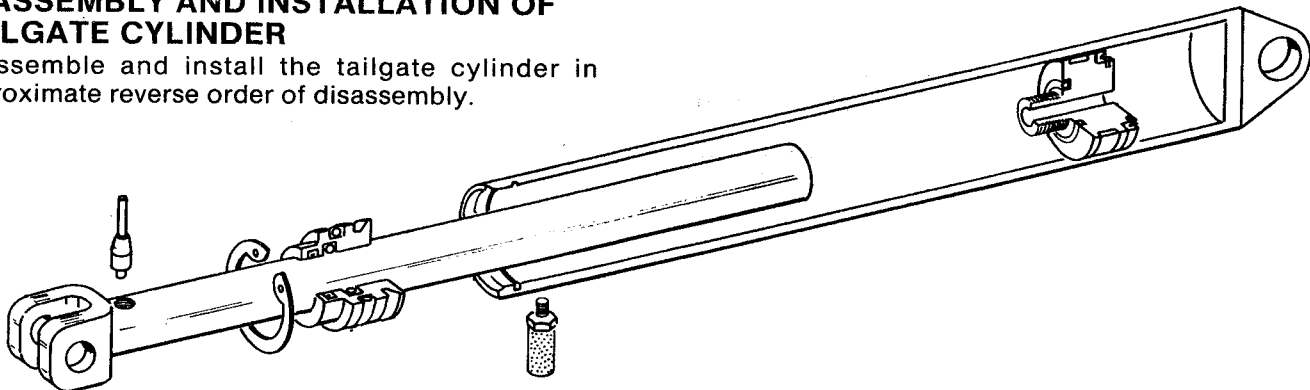
1. Thoroughly inspect the inside of the cylinder for cracks, scoring or uneven wear.
2. Check to make sure the breather is not plugged.
3. Check all cylinder components and mounting parts for damage and wear and replace as required. Parts that must be replaced together (o-rings and piston cups) are available as a Repair Kit from your dealer.

**NOTE**

If cylinder is not to be installed immediately, keep ports sealed to prevent dirt from entering cylinder.

### REASSEMBLY AND INSTALLATION OF TAILGATE CYLINDER

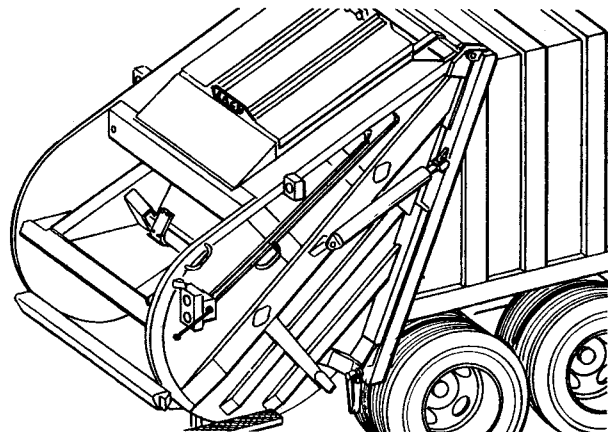
Reassemble and install the tailgate cylinder in approximate reverse order of disassembly.



### DESCRIPTION OF THE TAILGATE ASSEMBLY

The tailgate assembly houses the operating cylinders, carrier and packer plates and the "hopper" where refuse is first loaded into the 2R11 Packmaster. The tailgate is lifted (for unloading) and lowered by the tailgate lift cylinders which are actuated by the tailgate lift lever, located at the front of the body.

The need to remove the tailgate is rare and limited to repair of the hopper area and removal of the carrier plate. Procedures for carrier plate removal are different and are covered under REMOVAL OF CARRIER PLATE.



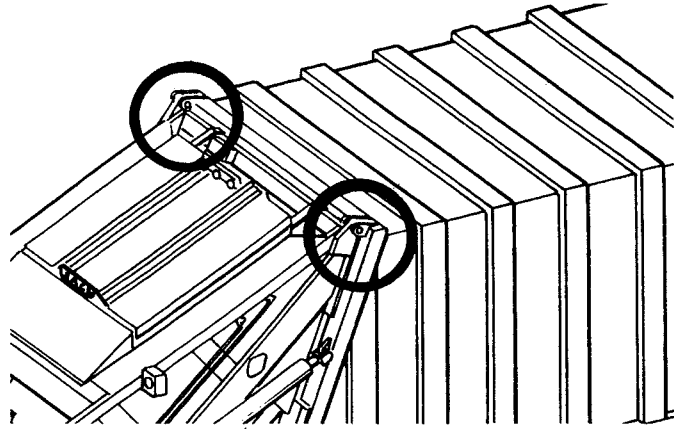


## REMOVAL OF THE TAILGATE ASSEMBLY

## Operational Status

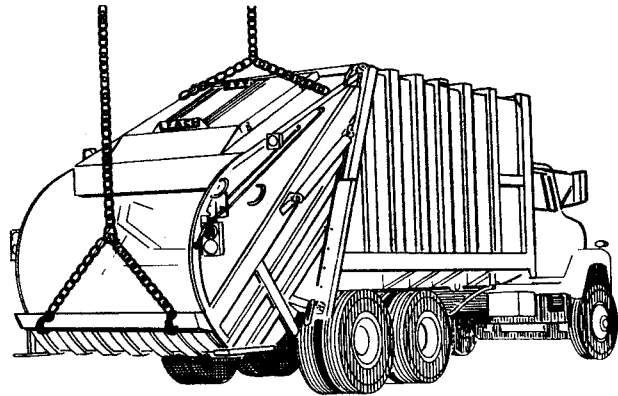
Truck	Off	Keys	Removed
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1. Release tailgate clamps.
2. Disconnect and remove tailgate lift cylinders as described earlier in this section.
3. Disconnect and cap hydraulic lines.

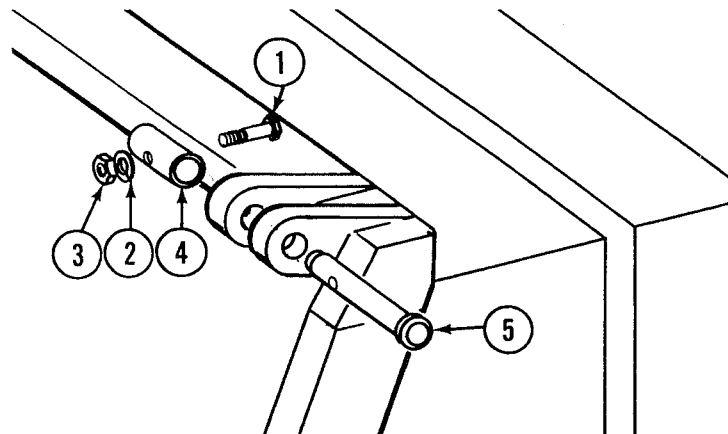
**NOTE**

See Sec. 4, GENERAL REPAIR PRACTICES, for detailed information about the correct use of slings and lifting chains.

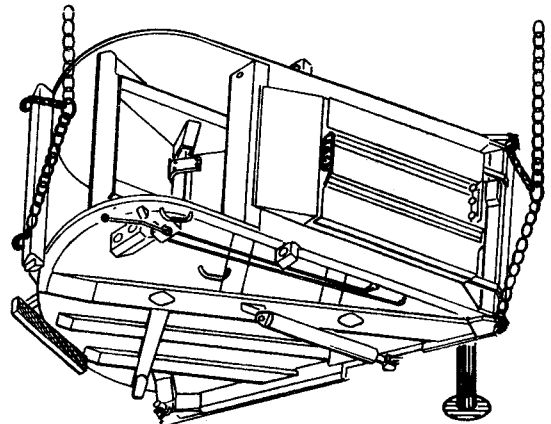
4. Attach chains, connected to a suitable lifting device with a minimum lift capacity of 7,500 lbs., to the tailgate as shown. Operate lifting device no more than necessary to support weight of tailgate.



5. Remove cap screw (1), lockwasher (2) and nut (3) to remove retainer (4) and hinge pin (5).

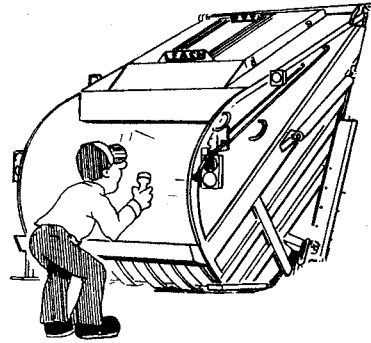


6. Operate lifting device and/or move truck to free tailgate from body.
7. Position tailgate on supports as needed to facilitate repairs. Supports must be capable of supporting 7,500 lbs.

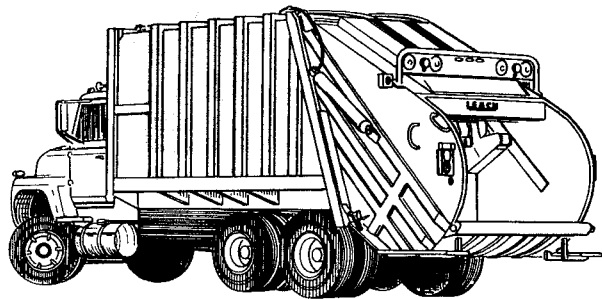


**SERVICE AND REPAIR****INSPECTION AND REPLACEMENT OF TAILGATE**

1. Inspect all sheet metal for badly bent or dented condition. Check hardware holes for enlargement or breaks in metal. Check threaded holes for stripped or otherwise damaged threads. Check rubber seal for any sign of deterioration. Check handles for looseness.
2. Replace any defective part. Follow all safety precautions pertaining to welding described in Sec. 2, SAFETY.
3. See Sec. 4, GENERAL REPAIR INSTRUCTIONS for information pertaining to welding repairs.

**REASSEMBLY AND INSTALLATION OF TAILGATE**

Reassemble and install tailgate in approximate reverse order of disassembly and removal.

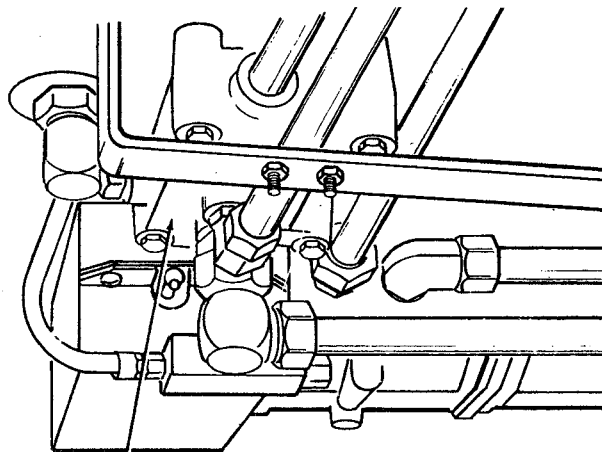
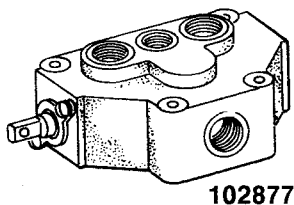
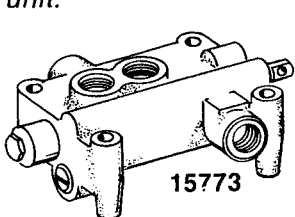
**DESCRIPTION OF SINGLE-SPOOL DIRECTIONAL CONTROL VALVES**

These two manually operated valves mounted under the top sheet at the front of tailgate, direct the extension or retraction of the four operating cylinders. They are single-spool, double-acting directional control valves, actuated by the packing lever located at the right rear of the tailgate. One directional valve directs hydraulic fluid from the main operating valve to the two carrier plate cylinders, and the other valve directs fluid to the packer plate cylinders.

It is important that the mechanical action of the directional valves be synchronized. This is achieved by proper adjustment of the valve operating rod assembly as described under installation later.

**NOTE:**

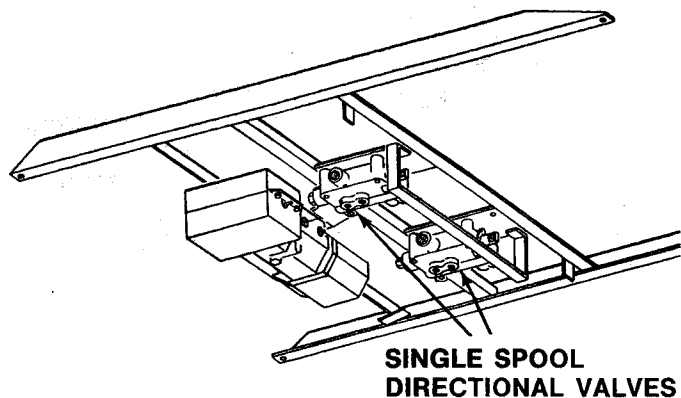
*Two different single spool valves are provided on the 2R11. Check the valve port locations to determine which valves are installed on your unit.*



**SINGLE SPOOL  
DIRECTIONAL  
VALVE**

## REMOVAL OF SINGLE-SPOOL DIRECTIONAL CONTROL VALVES

1. Remove top sheets as needed to gain access to the valve being removed.
2. Remove clevis pin connecting operating rod to valve.
3. Disconnect and cap all hydraulic lines to the valve.
4. Plug all open ports on valve.
5. Carefully remove attaching hardware while supporting valve.

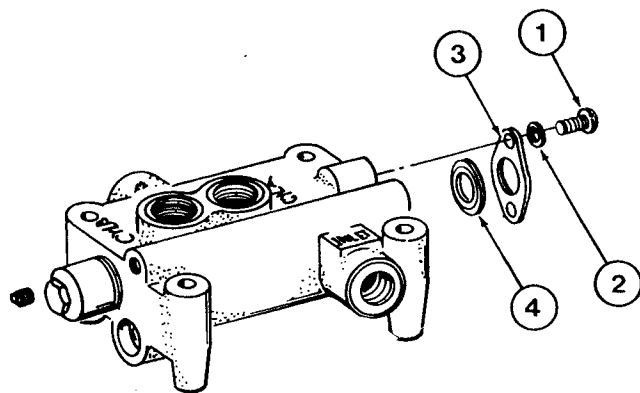


## DISASSEMBLY OF SINGLE-SPOOL (15773) DIRECTIONAL VALVE

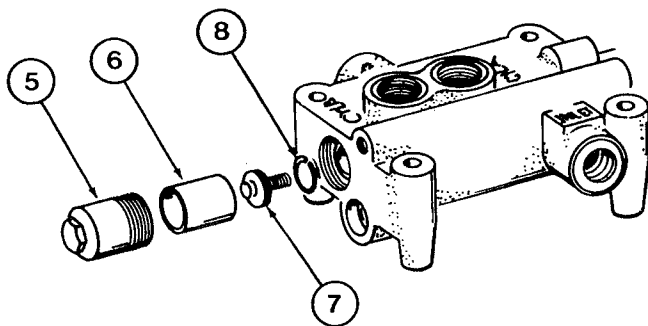
### CAUTION

Typically, only the D-Spool can be replaced (D-Spool indicates standard diameter of spool) during field repair of the valve. Make sure before any disassembly of the valve is started that the valve is cleaned thoroughly on the outside. Plug any open valve port immediately to prevent dirt from entering the valve body.

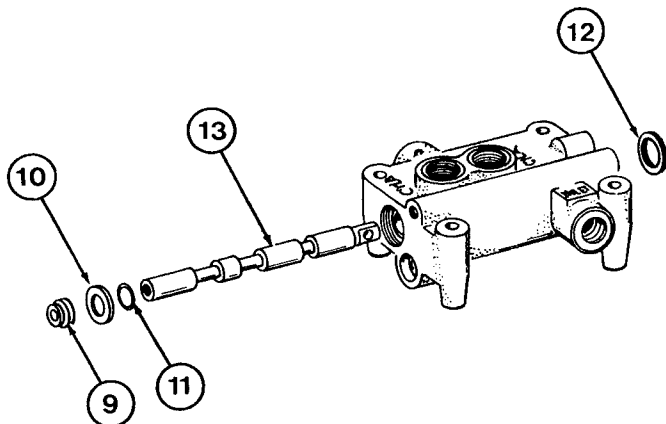
1. Remove capscrew (1), lockwasher (2), plate (3) and retainer (4).



2. Remove cap (5), barrel (6), retainer (7), and snap ring (8).



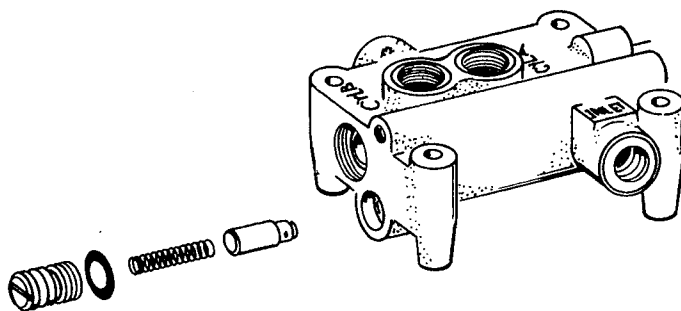
3. Remove retainers (9 & 10).
4. Remove o-rings (11 & 12).
5. Remove spool (13) carefully.



## SERVICE AND REPAIR

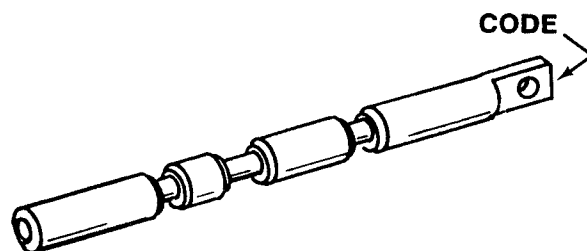
### INSPECTION OF SINGLE-SPOOL DIRECTIONAL VALVE

1. If valve has been completely disassembled, clean all parts in suitable solvent and dry.
2. Inspect for any signs of damage or wear, replacing parts as necessary.
3. Before installing a new spool, be sure it is absolutely clean.
4. Bore *must be smooth*. Inspect for any slight burrs. Remove these with crocus cloth.
5. Inspect reverse flow check valve poppet for wear.
6. Check spring for breaks.



### SPOOL ORDERING PROCEDURE

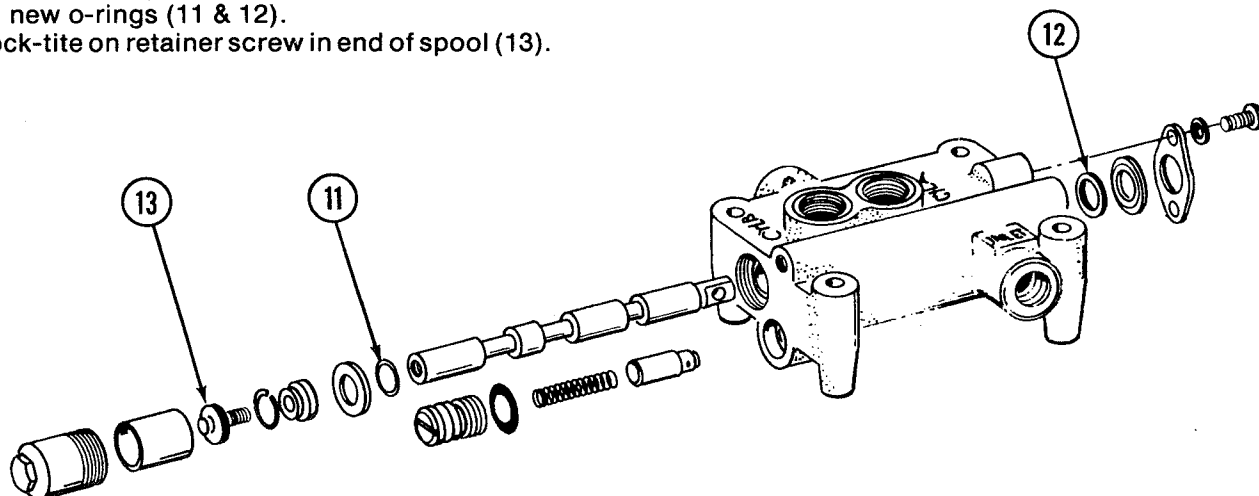
A replacement spool must be ordered by part number which is designated by code letter stamped on linkage end. Use a black spool for replacement during repair.



### REASSEMBLY OF SINGLE-SPOOL DIRECTIONAL VALVE

Reassemble single-spool directional valve in approximate reverse order of disassembly. Note the following:

1. The spool should slide into the bore with a slight hand pressure, and without perceptible side clearance. If there is any tendency for spool to bind or hang up, check again for a slight burr in bore.
2. Install new o-rings (11 & 12).
3. Use lock-tite on retainer screw in end of spool (13).



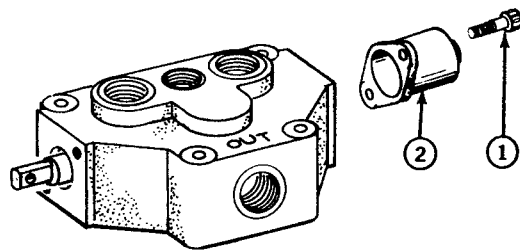
## REMOVAL OF SINGLE-SPOOL (102877) DIRECTIONAL CONTROL VALVES

1. Remove top sheets as needed to gain access to the valve being removed.
2. Remove clevis pin connecting operating rod to valve.
3. Disconnect and cap all hydraulic lines to the valve.
4. Plug all open ports on valve.
5. Carefully remove attaching hardware while supporting valve.

## DISASSEMBLY OF SINGLE-SPOOL DIRECTIONAL VALVE

### CAUTION

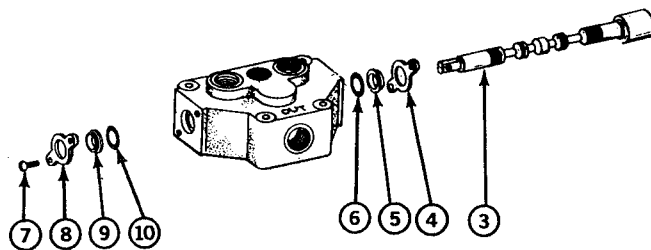
Make sure before any disassembly of the valve is started that the valve is cleaned thoroughly on the outside. Plug any open valve port immediately to prevent dirt from entering the valve body.



1. Remove capscrew (1), and cap (2).

2. Carefully remove spool assembly (3), plate (4), retainer (5) and o-ring (6).

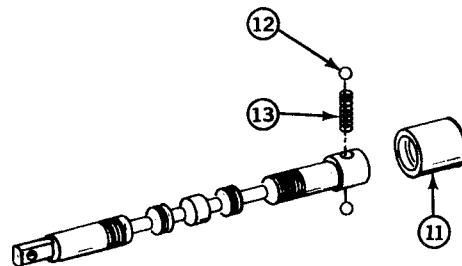
3. Remove capscrew (7), plate (8), retainer (9) and o-ring (10).



4. Remove detent collar (11) from spool. (Do not damage spool).

### NOTE:

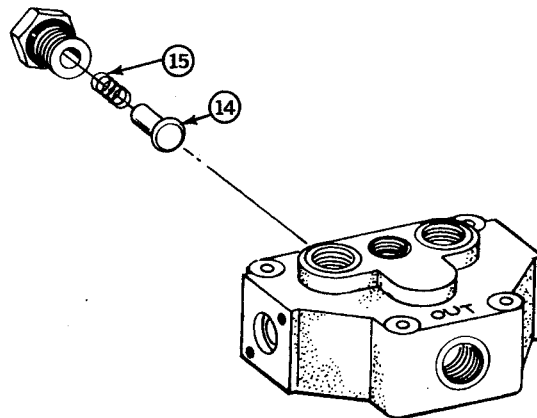
The detent balls are held in place by the collar. When the collar is removed, the ball (12) and spring (13) will pop free. Use care to avoid losing these small components.



## SERVICE AND REPAIR

### INSPECTION OF SINGLE-SPOOL DIRECTIONAL VALVE

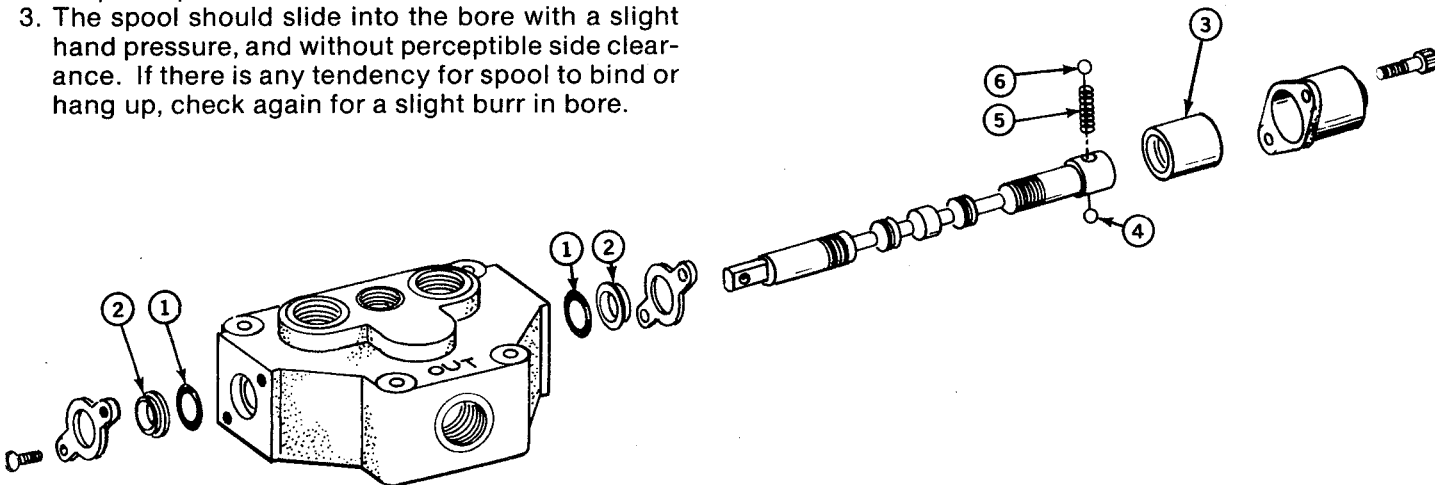
1. If valve has been completely disassembled, clean all parts in suitable solvent and dry.
2. Inspect for any signs of damage or wear, replacing parts as necessary.
3. Before installing a new spool, be sure it is absolutely clean.
4. Bore *must be smooth*. Inspect for any slight burrs. Remove these with crocus cloth.
5. Inspect reverse flow check valve poppet (14).
6. Check for broken spring (15).



### REASSEMBLY OF SINGLE-SPOOL DIRECTIONAL VALVE

Reassemble single-spool directional valve in approximate reverse order of disassembly. Note the following:

1. Install new o-rings (1) and retainers (2).
2. Prior to installing the spool, the detent must be assembled. Slide the collar (3), partially over the end of the spool. Tip the collar to hold the bottom ball (4) while inserting spring (5). Then depress top ball (6) and slide collar (3) forward until both balls snap into place inside the collar.
3. The spool should slide into the bore with a slight hand pressure, and without perceptible side clearance. If there is any tendency for spool to bind or hang up, check again for a slight burr in bore.



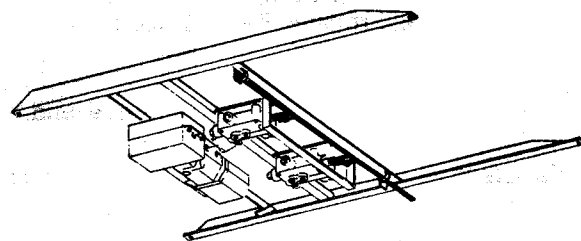
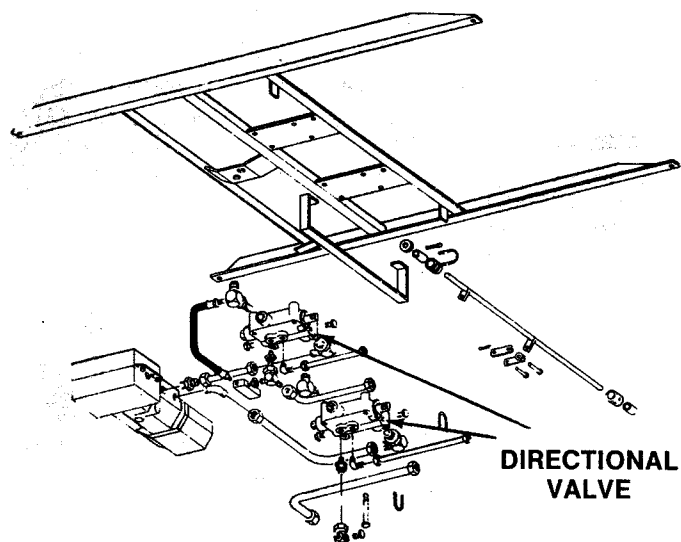
## INSTALLATION OF SINGLE-SPOOL DIRECTIONAL VALVE

1. Position valve on H-Frame assembly and secure in place with attaching hardware.
2. Reconnect all hydraulic lines to valve.

### NOTE

*The valves must be synchronized as described below.*

3. Pull the spools on both valves all the way out.
4. Adjust length of operating rod assembly so both clevis pins can be connected without moving spools.
5. Connect spools to operating rod with appropriate cotter pins, clevis pins and spool links.
6. Now push both spools all the way in and check that both clevis pins are free in this position.



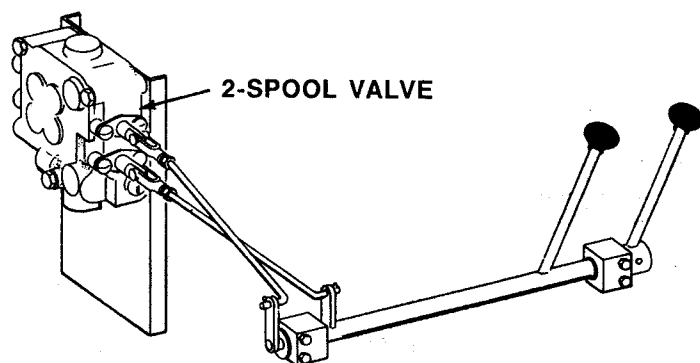
## DESCRIPTION OF 2-SPOOL CONTROL VALVE FOR TAILGATE LIFT AND PUSHOUT CYLINDERS

This manually operated valve provides directional control to the cylinders for raising and lowering the tailgate, and to the cylinders which move the pushout plate rearward and clamp it. The valve is a two-spool control type, mounted at the front of the body in front of the pushout plate. The upper spool operates the tailgate lift cylinders and is linked through a control rod to the inner shaft, or tailgate lift lever, of the lever control arm assembly. The lower spool operates the pushout mechanism and is linked, through a second control rod, to the outer shaft, or pushout lever of the same lever control arm assembly.

This valve also has the main pressure relief for the hydraulic system.

### NOTE

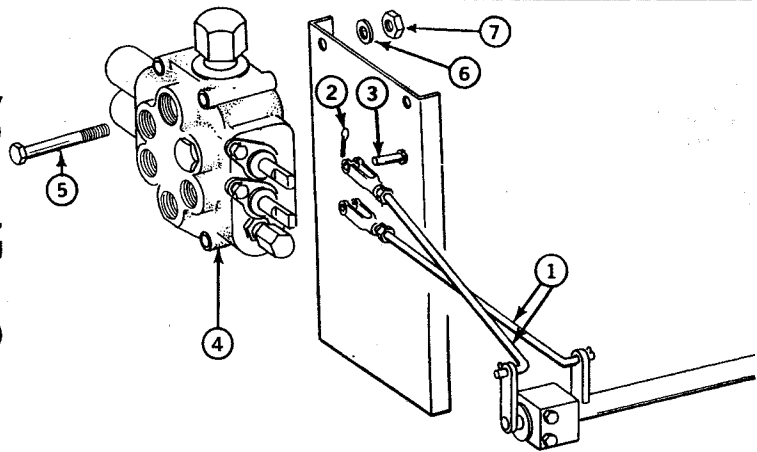
*The unit may have either a 2-spool directional or a 2-spool tandem circuit valve installed. Both valves are listed in the service literature.*



## SERVICE AND REPAIR

### REMOVAL OF 2-SPOOL DIRECTIONAL VALVE

1. Disconnect the two valve control rods (1) by removing cotter pins (2) and clevis pins (3) attaching rods to valve spool linkage ends (4).
2. Disconnect hydraulic lines to the valve. Cap lines, and plug valve ports to prevent dirt from entering the valve.
3. Take out capscrews (5), lockwashers (6), nuts (7) and remove valve.



### DISASSEMBLY OF 2-SPOOL DIRECTIONAL VALVE

1. Clean paint, dirt, and burrs, from end of spool.
2. Remove two (2) capscrews, item 2, from the spring covers, item 1.
3. Disassemble spring pack by removing Allen head bolt, item 3, and remove items 9, 10, 11, 12, 13, 14 and 15.
4. Remove plate, item 5.
5. Pull spool, item 4, out through the eye end.

#### NOTE

*For cleaning or inspection, this is probably as far as you will need to go with disassembly.*

6. Remove wipers, item 6.
7. Use a long brass rod and drive seal, item 7, out from the opposite end of the plunger bore.

### CAUTION

**Be careful not to scratch the spool or seal bore. Any scratches will scrap the valve.**

#### NOTE

*If seals are being replaced in both spools repair each spool, one at a time to insure that the spools are reinstalled in their proper bores. The spools are different.*

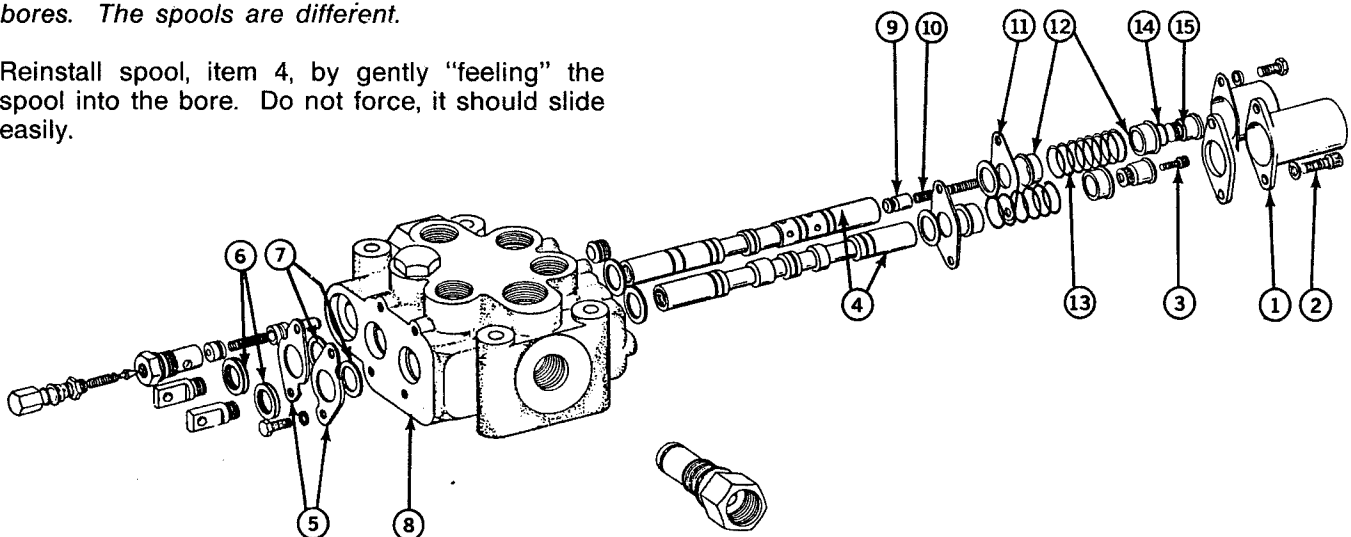
8. Reinstall spool, item 4, by gently "feeling" the spool into the bore. Do not force, it should slide easily.

9. Center the spool in its approximate neutral position in the valve body, item 8.
10. Place a piece of plastic film over the end of the spool, item 4.
11. Grease the "Vamac" seal, item 7, and slide over the spool, item 4, and push into the seal bore.

#### NOTE

*The word "outside" should be showing.*

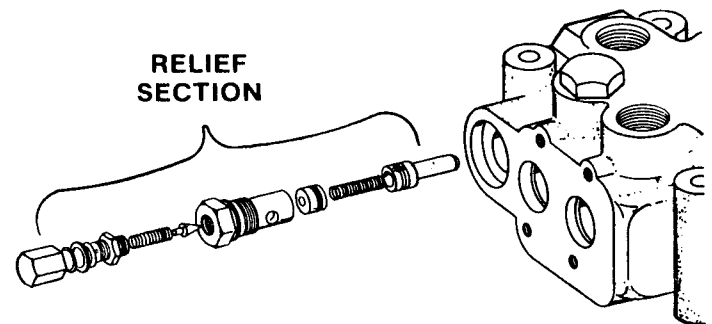
12. Make certain to remove all the plastic film to prevent a leak.
13. Press the new seal(s), item 7, into the bore by using a driver .010 or smaller than the inside diameter bore of the valve body. Gently drive the seal, item 7, flush with item 8.
14. Install new wipers, item 6.
15. Install retainer plates, item 5.
16. Reinstall the spring pack, items 9, 10, 11, 12, 13, 14 and 15.
17. Locktite capscrew, item 3, and tighten to 8 foot pounds.
18. Reinstall spring covers, item 1.
19. If necessary for cleaning or repair, the relief valve section can be removed and disassembled.





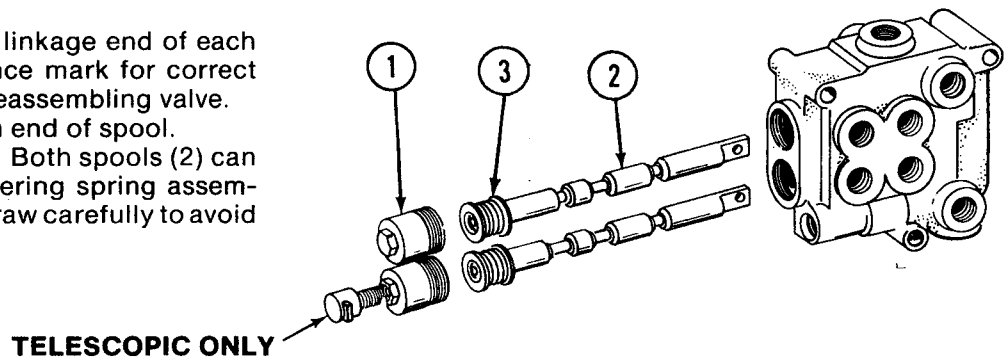
## SERVICE AND REPAIR

19. If necessary for cleaning or repair, the relief valve section can be removed and disassembled.



### DISASSEMBLY OF 2-SPOOL DIRECTIONAL VALVE

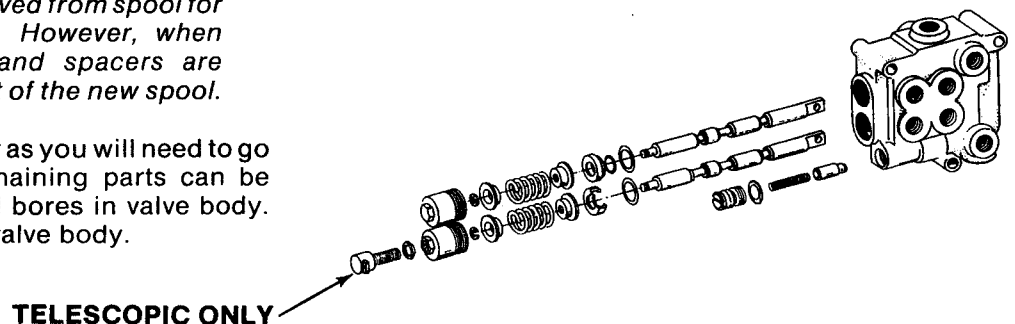
1. Note the code letter on the linkage end of each spool. This is your reference mark for correct placement of spools when reassembling valve.
2. Clean paint, dirt, burrs, from end of spool.
3. Remove spool end caps (1). Both spools (2) can be withdrawn with the centering spring assemblies (3) still in place. Withdraw carefully to avoid damaging seals.



#### NOTE

The centering spring assembly, held in place by a snap ring, can be removed from spool for cleaning and inspection. However, when replacing spool, spring and spacers are supplied assembled as part of the new spool.

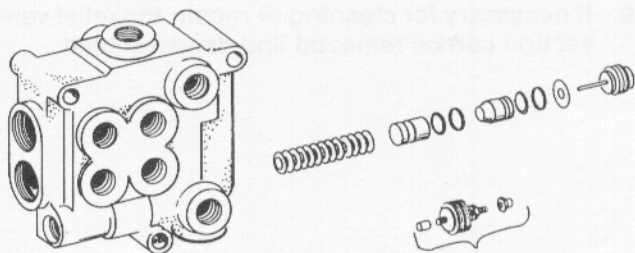
4. While this is probably as far as you will need to go with disassembly, the remaining parts can be removed easily from spool bores in valve body. Use care to avoid scoring valve body.



## SERVICE AND REPAIR

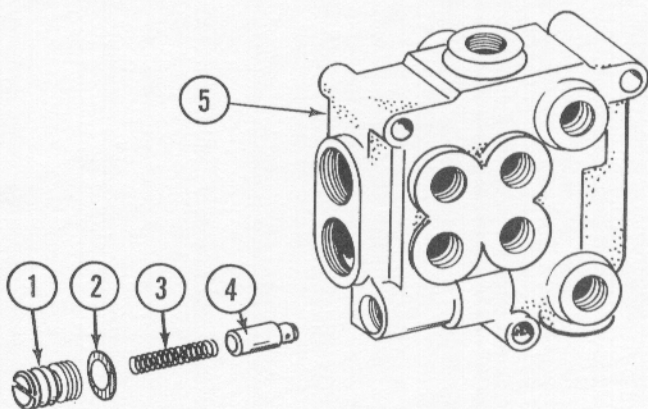
## RELIEF VALVE SECTION

5. If necessary for repair or shimming, the relief valve section can be disassembled. Remove the relief cap and the remaining parts will come out. If spring doesn't come out, use a small hook to grab a coil of spring to pull it out.



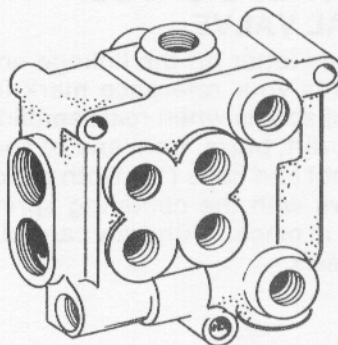
## CHECK VALVE SECTION

6. If necessary for repair, the check valve section can be disassembled. Remove cap (1), the remaining o-ring (2), and spring (3). Now poppet (4) will easily come out of the body (5).



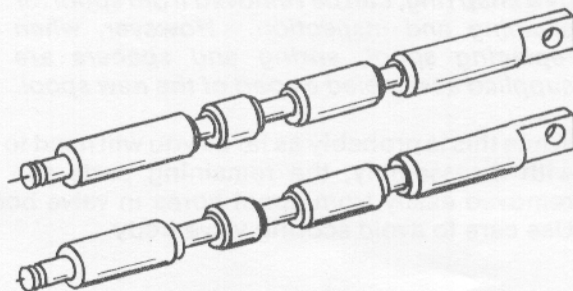
## INSPECTION OF 2-SPOOL DIRECTIONAL CONTROL VALVE

1. Use solvent to clean thoroughly all parts removed; air dry.
2. Inspect the valve body spool bores for any slight burrs. Bores must be smooth. Remove burrs with crocus cloth.
3. Inspect all other parts for wear and damage. Replace as necessary.
4. Before installing a new spool, be sure it is absolutely clean. Also, again inspect spool bores to be sure no dust or dirt has entered.



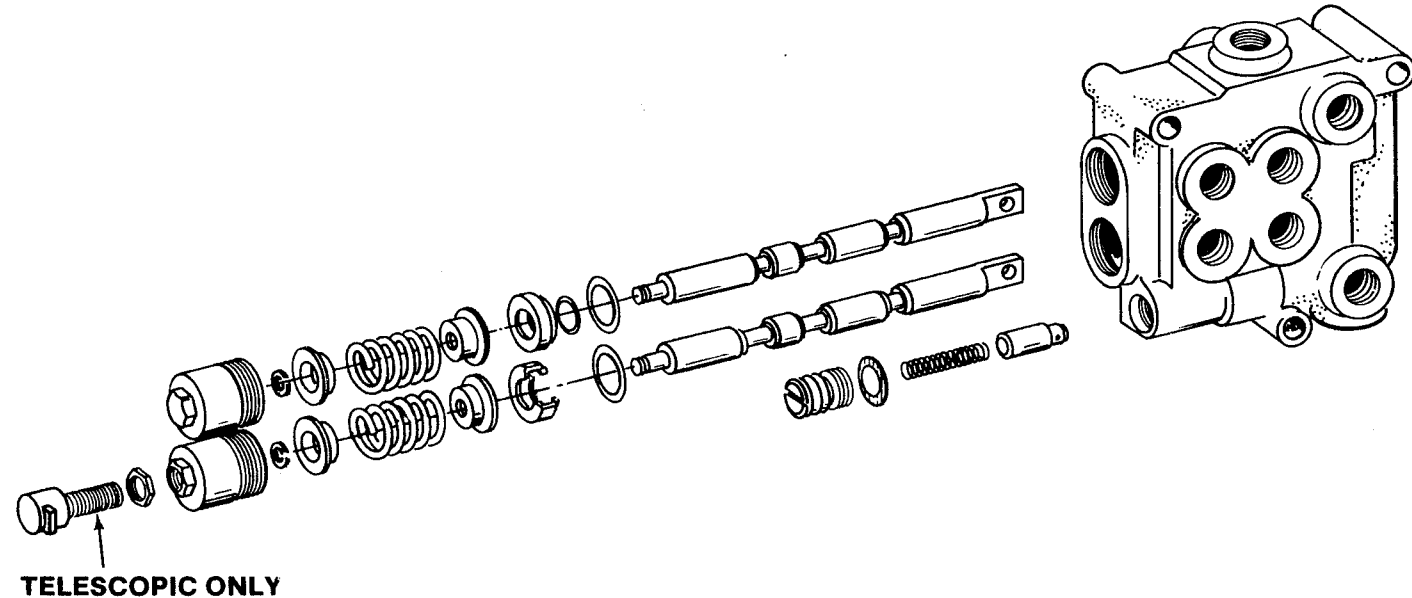
## SPOOL ORDERING PROCEDURE

Replacement spools must be ordered by (1) part number, which is designated by code letter stamped on linkage end; and by (2) color code, which determines diameter and will be found marked either on cap end of spool or on undercut nearest linkage end.



## REASSEMBLY AND INSTALLATION OF 2-SPOOL DIRECTIONAL CONTROL VALVE

Reassemble and install parts in the reverse order of disassembly.



## RELIEF VALVE SECTION

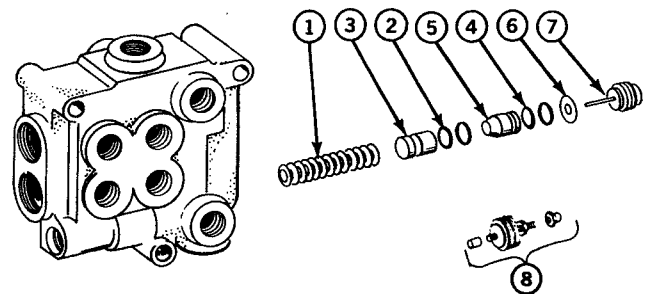
### NOTE

The number of shims (if so equipped) used determines the cracking PSI of the relief valve. (Each shim equals 50 PSI). Be sure to install the same number as removed, or the performance of the valve will be affected.

### NOTE

Springs are color coded, use one with a green stripe.

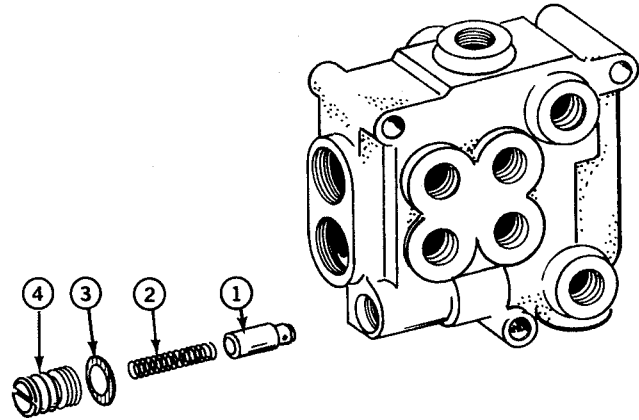
1. Install spring (1) in bore.
2. Fit rings (2) in plunger (3) grooves, and insert plunger into bore, solid end first.
3. Install rings (4) on valve seat (5) and insert into bore, tapered end first.
4. Insert the proper number of shims (6) and install cap (7) or install adjustment screw assembly (8).



## SERVICE AND REPAIR

### CHECK VALVE SECTION

1. Insert poppet (1) into valve bore.
2. Place spring (2) into poppet.
3. Install a new o-ring (3) on cap (4).
4. Seat cap over spring and tighten cap.

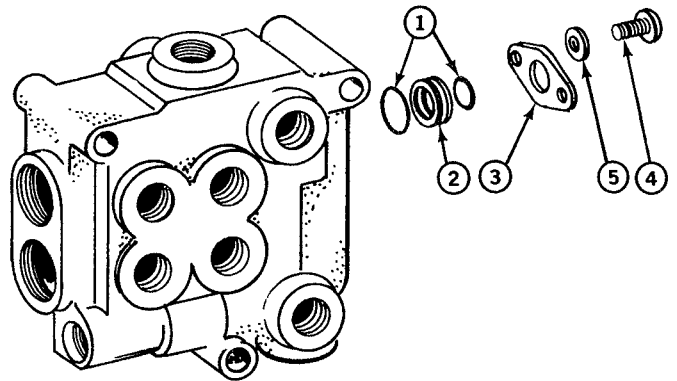


### 2-SPOOL SECTION

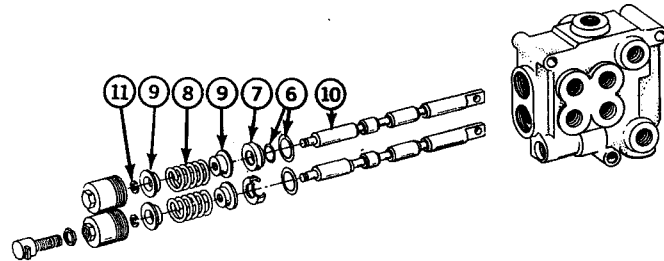
1. Starting with the linkage end, install o-rings (1) on body seals (2) and position in body flange.
2. Install retaining plates (3) and secure with cap-screws (4) and lockwashers (5), tightening screws evenly.

**NOTE:**

*On later valves, the external seals and retainer plates are replaced by a single internal O'Ring.*

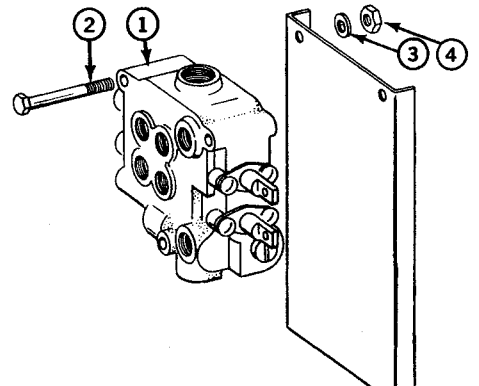


3. Install o-rings (6) on retainers (7) and insert into body.
4. Position spring (8) between two spring retainers (9). Slide these assembled parts into spool (10) and secure with snap ring (11).
5. Slide spools, linkage end first, into spool bores. Make sure the correct spool is installed in the correct bore. Spools should slide smoothly with only a slight hand pressure. If there is any tendency to bind or snag, remove spools and again examine valve body bores for burrs; remove with crocus cloth. Re-insert spools.
6. Install end caps.

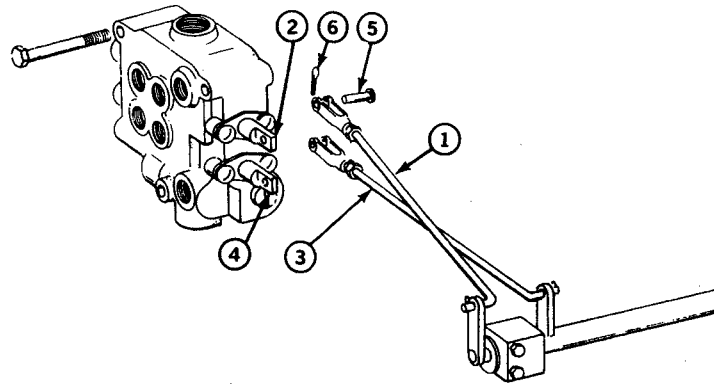


### INSTALLATION OF 2-SPOOL DIRECTIONAL CONTROL VALVE

1. Secure valve (1) to mounting bracket using cap-screws (2), lockwashers (3) and nuts (4).

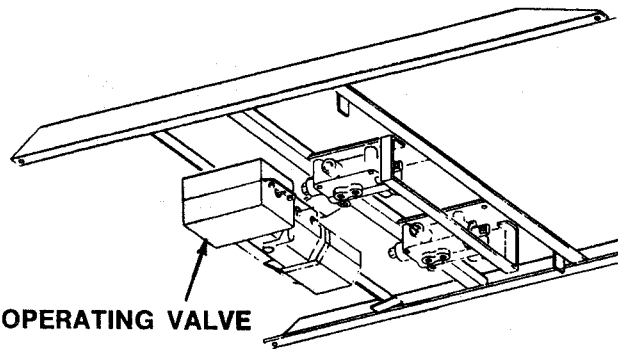


2. Connect the tailgate lift control rod (1) to the upper spool lever (2), using pin (5) and cotter pin (6).
3. Connect the pushout control rod (3) to the lower spool lever (4) with pin (5) and cotter pin (6).
4. Connect all hydraulic lines and tighten securely.
5. Recheck main relief valve pressure as described under PRESSURE CHECKS, Sec. 7, CHECK-OUT.



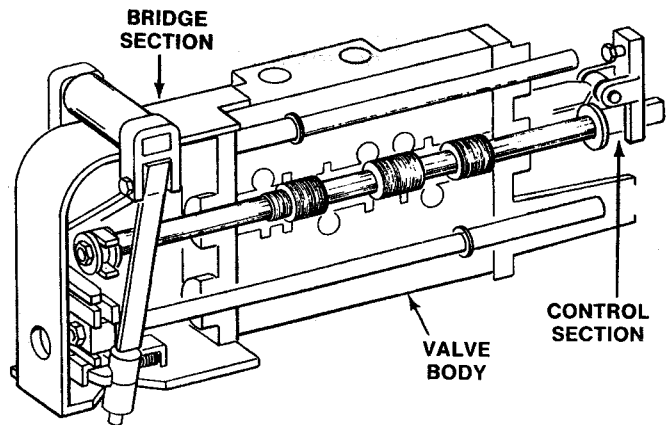
**DESCRIPTION OF MAIN OPERATING VALVE**

The main operating valve controls hydraulic flow, and thus, the action of the packer and carrier plates through the entire packing cycle.

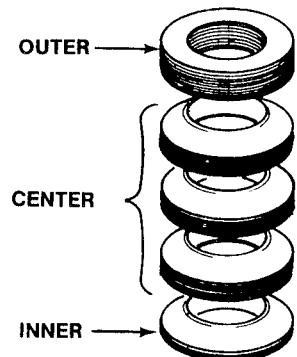


**MAIN OPERATING VALVE**

A functional description for the main operating valve is covered in Section 8, Troubleshooting.



**PACKING**



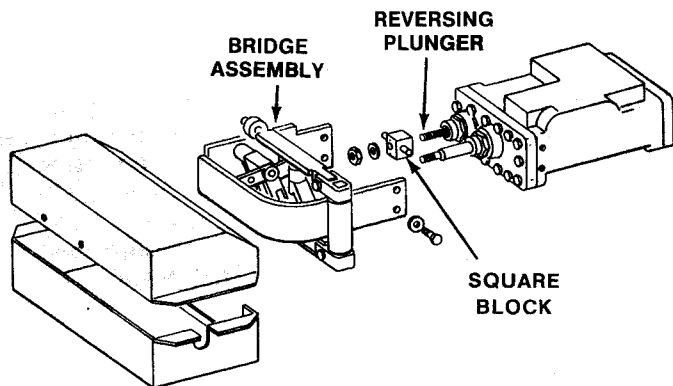
**RESEALING THE MOV**

The main spool, reversing plunger, and knockout plunger are sealed with five (5) segments of "V" Chevron packing.

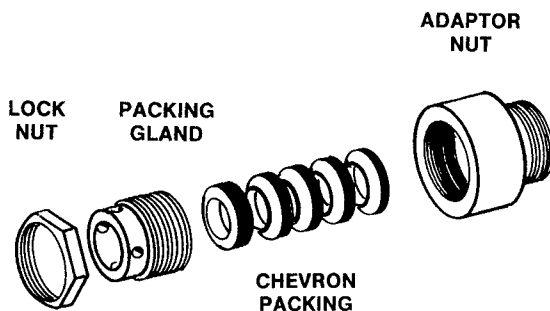
## SERVICE AND REPAIR

### REVERSING PLUNGER

1. Remove the bridge assembly covers.
2. Remove the bridge assembly by removing four (4) 5/16" capscrews.
3. Remove the reversing plunger nut and washer from the reversing plunger.
4. Remove the square block from the reversing plunger. (Note the filed corner.)



5. Remove the locknut from the brass packing gland.
6. Remove the brass packing gland from the steel adaptor nut.
7. Remove the old packings, one (1) outer, three (3) center, and one (1) inner.
8. Lubricate all the new packing segments to be used.



**NOTE**

The packing kit contains one (1) extra center segment. Discard this extra segment.

9. Using Leach T-B19516-7-628 packing tool, insert the lubricated packing segments in order: inner (1) center (3) and outer (1).
10. Insert and thread the brass packing gland into the steel adaptor nut. The brass gland should be lightly torqued (slightly more than finger tight) to compress and seat all the packing segments.

**NOTE**

Over compression of the packing segments may interfere with plunger travel. Simply loosening the packing gland will NOT allow the packing to loosen. Completely remove the packing and reinstall, being careful to not over-tighten.

11. Thread and tighten the locknut onto the brass packing gland.

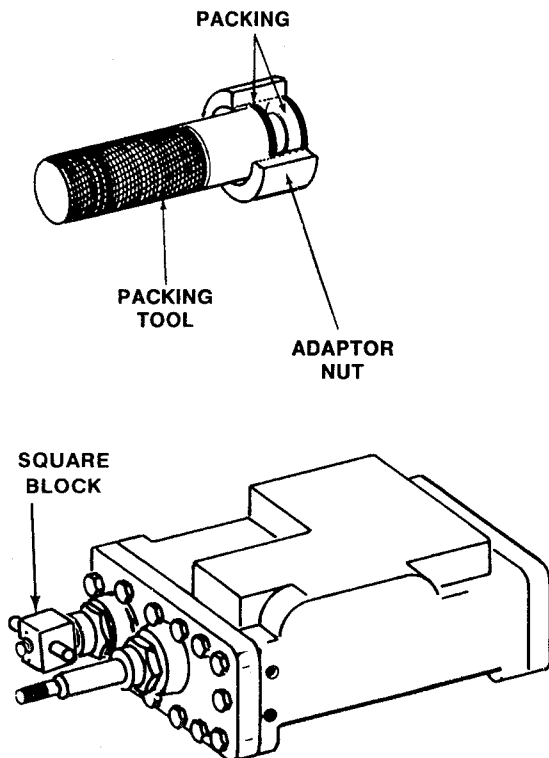
**NOTE**

The brass gland may require periodic adjustment to compress the packing segments as the packing segments are worn by the reversing plunger. To adjust, loosen the locknut and tighten the brass packing gland being careful to not over-tighten. Tighten the locknut.

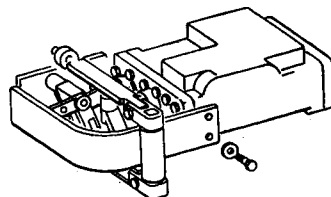
12. Thread the square block onto the reversing plunger shaft with approximately an equal number of threads exposed.

**NOTE**

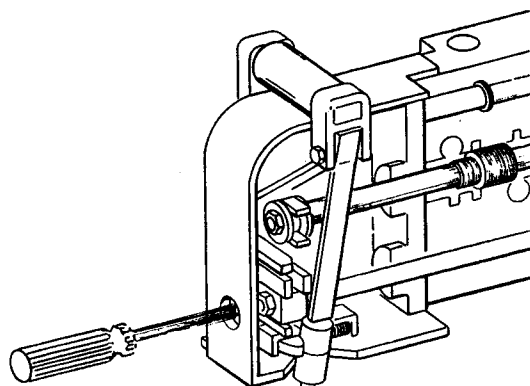
The filed corner of the square block should be towards the valve body and the main spool.



13. Reinstall the bridge assembly. The final position of the bridge assembly should not restrict or bind the main spool travel.



14. Use a flat screwdriver in the slot on the end of the plunger shaft to position the square block on the reversing plunger shaft. Three quarters of an inch (3/4") should be exposed between the threaded end of the reversing plunger and the square block.
15. Install the washer and torque the lock nut onto the reversing plunger.
16. Test the valve operation before replacing the bridge assembly covers.

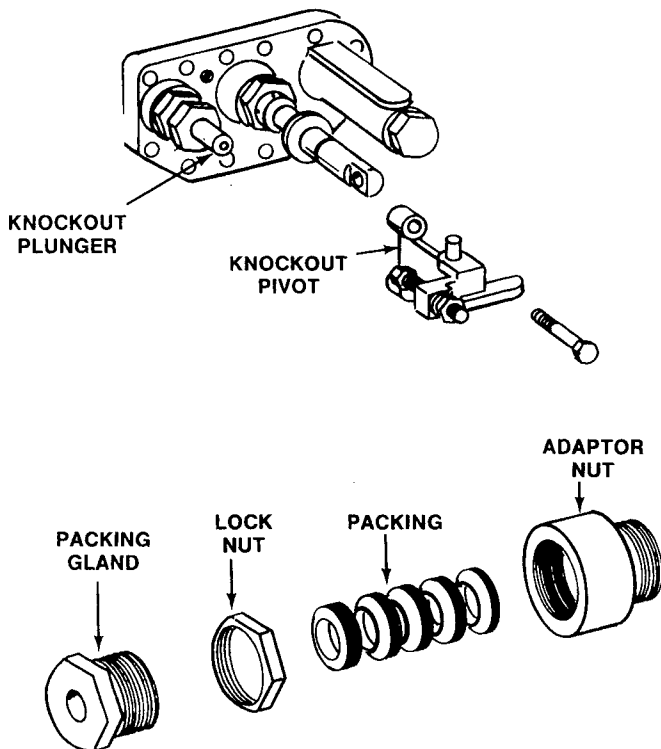


### KNOCKOUT PLUNGER

1. Remove the control section cover.
2. Remove the knockout pivot assembly by removing the two (2) capscrews from the valve end plate.
3. Loosen the lock nut on the brass packing gland.
4. Remove the brass packing gland and the lock nut from the steel adaptor nut.
5. Remove the packing: outer (1) center (3) and inner (1).
6. Lubricate all the new segments of packing to be used.

#### NOTE

The packing kit contains one (1) extra center segment. Discard this extra segment.

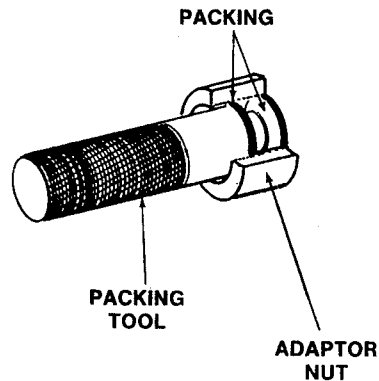


## SERVICE AND REPAIR

7. Using Leach T-B19516-7-628 packing tool, insert the lubricated packing segments in order, inner (1) center (3) and outer (1).
8. Insert and thread the brass packing gland into the steel adapter nut. The brass gland should be lightly torqued (slightly more than finger tight) to compress and seat all packing segments.

**NOTE**

*Over compression of the packing segments may interfere with plunger travel. Simply loosening the packing gland will NOT allow the packing to loosen. Completely remove the packing and reinstall, being careful to not over-tighten.*



9. Thread and tighten the locknut to the brass packing gland.

**NOTE**

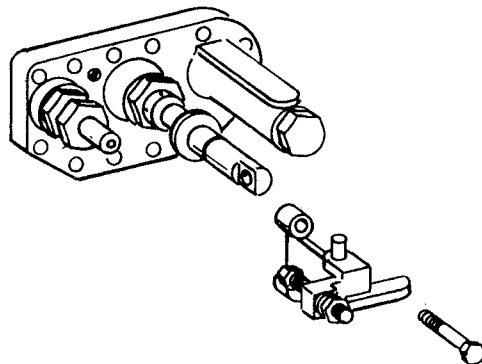
*The brass gland may require periodic adjustment to compress the packing segments as the segments are worn by the knockout plunger. To adjust, loosen the locknut and tighten the brass packing gland. Tighten the locknut, do not over-tighten.*

10. Reinstall the knockout pivot to the valve end plate.

**NOTE**

*A minimum of 1/8" is required between the knockout pivot and knockout plunger.*

11. Test the valve operation before replacing the control section cover.



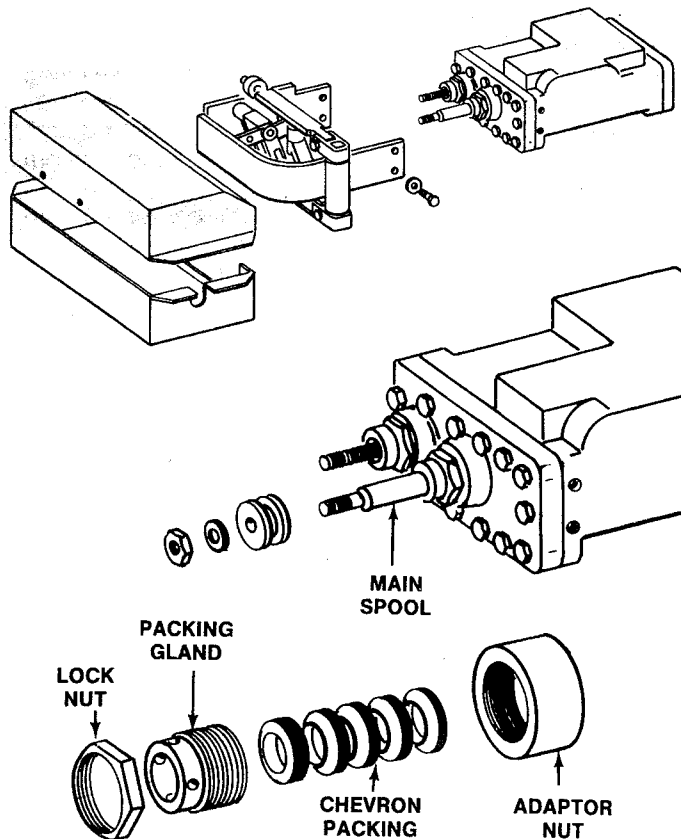
## MAIN SPOOL

### BRIDGE SIDE

1. Remove the bridge assembly covers.
2. Remove the bridge assembly by removing the four (4) 5/16" cap screws.
3. Remove the nut and lockwasher on the end of the main spool.
4. Remove the collar from the main spool.
5. Loosen the lock nut on the brass packing gland.
6. Remove the brass packing gland from the valve end plate.
7. Remove the packings, outer (1) center (3) inner (1).
8. Lubricate all the new segments of packing to be used.

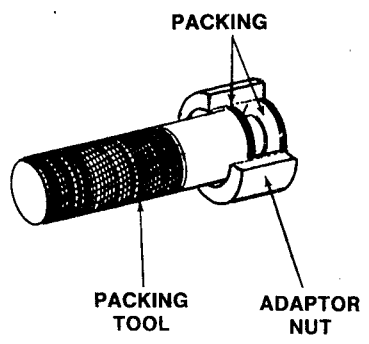
**NOTE**

*The packing kit contains two (2) extra center segments. Discard the two (2) extra segments.*





- Using Leach T-B19516-4-753 packing tool, insert the lubricated packing segments in order, inner (1) center (3) and outer (1).



- Insert and thread the brass packing gland into the valve end plate. The brass packing gland should be lightly torqued (slightly more than finger tight) to compress and seat all packing segments.

**NOTE**

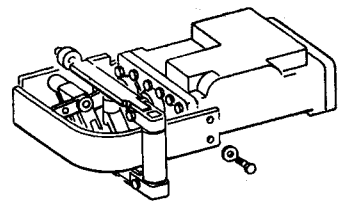
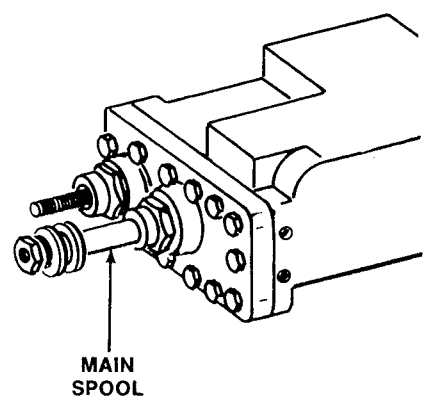
*Over compression of the packing segments may interfere with main spool travel. Simply loosening the packing gland will NOT allow the packing to loosen. Completely remove the packing and reinstall, being careful to not over-tighten.*

- Tighten the locknut onto the brass packing gland.
- Install the collar onto the main spool.
- Install the lockwasher and torque the nut onto the main spool. Do not over torque the nut. The main spool should shift smoothly by hand.
- Install the bridge assembly.
- Tighten the nut on the main spool.

**NOTE**

*Over tightening of the nut may interfere with the main spool travel when the collar is re-inserted onto the bridge yoke. The main spool should shift smoothly by hand.*

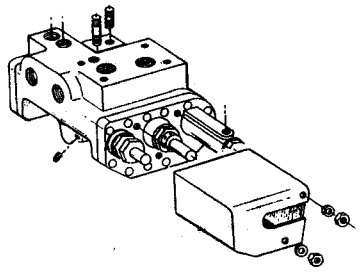
- Test the valve operation before installing the bridge assembly covers.



**MAIN SPOOL**

**ROD/KNOCKOUT SIDE**

- Remove the control section cover and studs.
- Remove the control rod from the main spool nut.



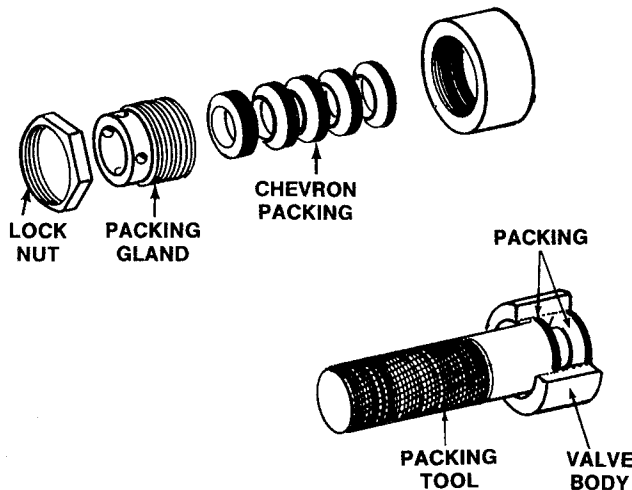
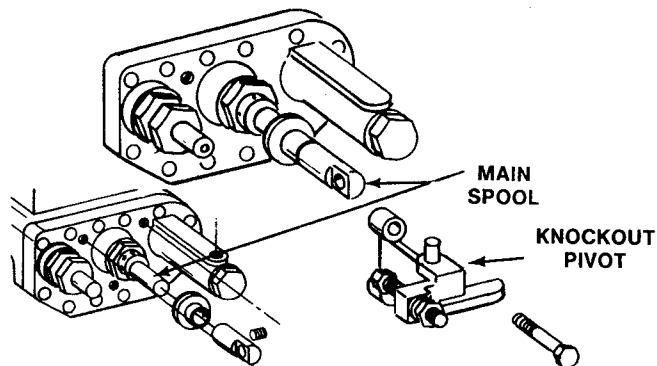
## SERVICE AND REPAIR

3. Remove the knockout pivot assembly by removing the two (2) capscrews in the valve end plate.
4. Loosen the Allen set screw in the main spool nut.
5. Remove the main spool nut from the main spool.
6. Remove the washer from the main spool.
7. Loosen the locknut from the brass packing gland.
8. Remove the brass packing gland from the valve end plate.
9. Remove the packings, outer (1) center (3) inner (1).
10. Lubricate all the new segments of the packing to be used.

**NOTE**

The packing kit contains two (2) extra center segments. Discard these extra segments.

11. Using Leach T-B19516-7-753 packing tool, insert the lubricated packing segments in order, inner (1) center (3) and outer (1).



12. Insert and thread the brass packing gland into the valve end plate. The brass packing gland should be lightly torqued (slightly more than finger tight) to compress and seat all packing segments.
13. Tighten the locknut to the brass packing gland.

**NOTE**

The brass packing gland may require periodic adjustment to compress the packing segments as the packing segments are worn by the main spool. To adjust, see previous adjustment.

14. Thread the knockout washer onto the main spool.
15. Thread and tighten the main spool nut onto the main spool.
16. Tighten the Allen set screw into the main spool nut.

**NOTE**

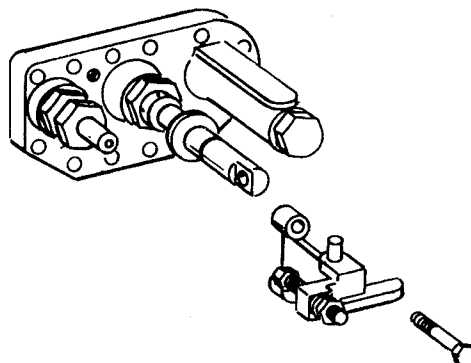
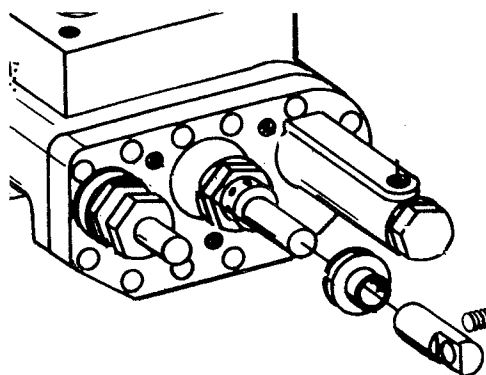
Position the set screw 180° from the knockout pivot by rotating the main spool if necessary.

17. Reinstall the knockout pivot assembly.

**NOTE**

A minimum of 1/8" clearance between the adjusting capscrew and the knockout plunger must be present.

18. Reinstall the control rod into the main spool.
19. Install the studs and the control section cover.



**RESEALING THE MOV**

Gaskets are used to seal the bridge section and the control section valve end plates to the valve body.

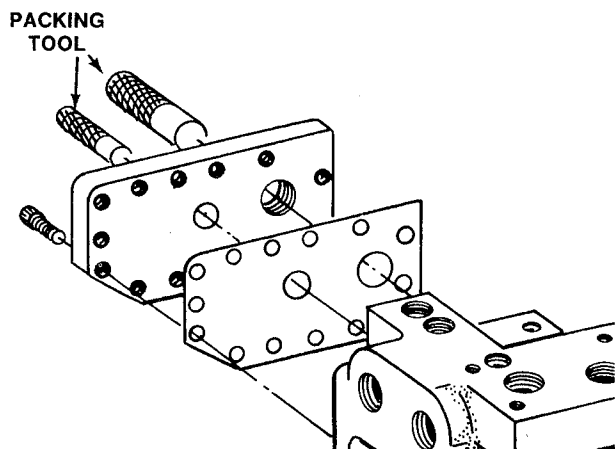
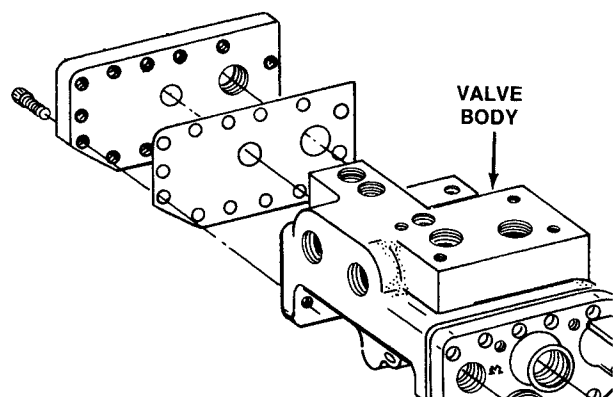
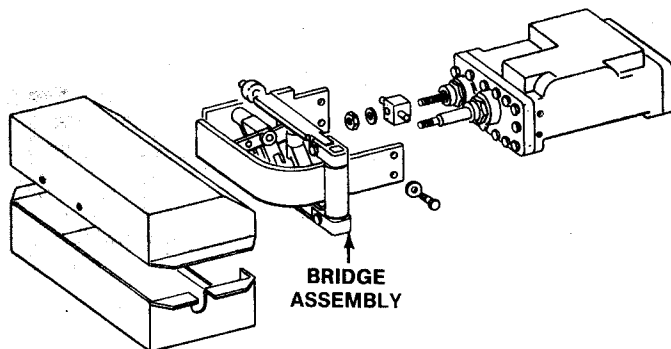
**BRIDGE SECTION**

1. Remove the bridge assembly covers.
2. Remove the bridge assembly by removing the four (4) 5/16" capscrews.
3. Remove from the reversing plunger the following items: nut, washer, square block, lock nut, brass packing gland, and packing segments.
4. Remove from the main spool the nut, lockwasher, collar, lock nut, brass packing gland, and packing segments from the valve end plate.
5. Remove all thirteen (13) Allen head capscrews and lockwashers from the end plate, beginning in the center and continuing in a crossing pattern.
6. Carefully separate the end plate from the valve body and gently remove the end plate from the main spool and reversing plunger.
7. Remove all gasket material from the valve end plate and the valve body. Clean both surfaces thoroughly. Inspect the valve end plate and the valve body for abnormal wear or warpage.
8. Align the new gasket with the valve end plate.
9. Carefully place the valve end plate and gasket over the main spool and reversing plunger and align with the valve body holes.
10. Start all thirteen (13) Allen capscrews and lockwashers into the valve body.
11. Insert Leach T-B19516-4 & T-B19516-7 packing tools into the reversing plunger steel adapter nut and main spool opening of the valve end plate. The packing tools will assist in aligning the valve end plate with the valve body. Incorrect alignment may interfere with the main spool and reversing plunger travel.
12. Using a crossing pattern beginning in the middle of the valve end plate, thread all thirteen (13) capscrews and lockwashers into the valve end plate until the lockwashers contact the valve end plate. The main spool should shift smoothly by hand.

**NOTE**

*The end plate should contact the valve body evenly to avoid warping the valve end plate.*

13. Using a crossing pattern beginning in the middle of the valve end plate, apply final torque to all thirteen (13) Allen head screws. The main spool should shift smoothly by hand, if not, loosen the Allen head screws and adjust the alignment of the valve end plate.
14. Remove the Leach T-B19516-4 & 7 packing tools from the reversing plunger steel adapter nut and the main spool opening in the valve end plate.
15. Reinstall the main spool packing segment (see resealing main spool items 9-15) the brass packing gland, locknut, collar, lockwasher, and nut.

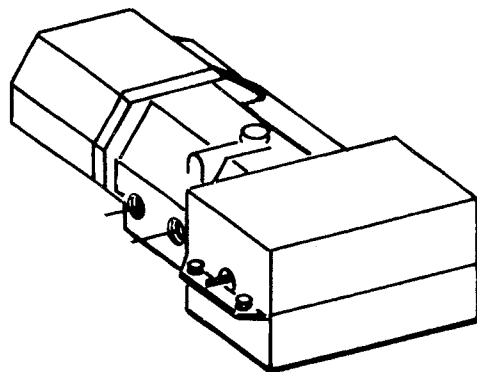


## SERVICE AND REPAIR

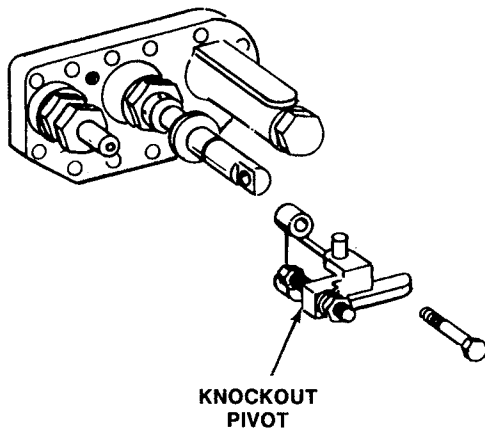
**NOTE**

*New packing segments should be installed.*

16. Reinstall the reversing plunger packing segments (see resealing main spool items 9-15) the brass packing gland, locknut, square block, washer, and nut.
17. Reinstall the bridge assembly.  
*The main spool should shift smoothly by hand. Adjustment of the bridge assembly position may be necessary.*
18. Replace the bridge assembly covers.

**CONTROL SECTION**

1. Remove the cover and cover studs from the valve end plate.
2. Remove the control rod from the main spool nut.
3. Remove the knockout pivot assembly by removing the two (2) capscrews from the valve end plate.



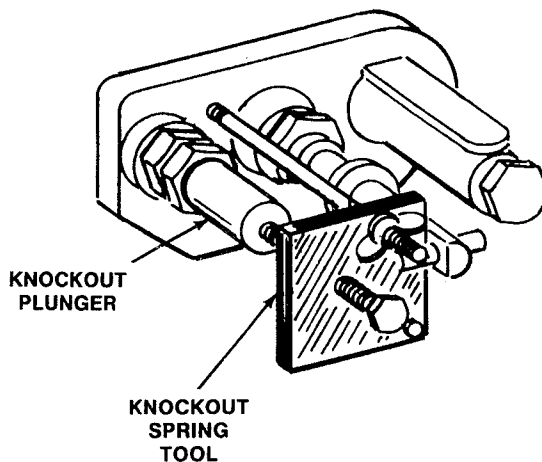
**KNOCKOUT  
PIVOT**

4. Install Leach T-B19516-6 knockout spring tool by:
  - A. Shifting the main spool completely towards the control rod.
  - B. Inserting the pin of the tool into the opening of the main spool nut.
  - C. Installing the tool studs into the knockout pivot assembly mounting holes in the valve end plate.
5. Place the tool cap over the end of the knockout plunger.
6. Tighten the tool capscrew against the end of the cap.
7. Loosen the steel adapter nut.

**NOTE**

*The knockout spring is continually under tension. This tool allows controlled release of the knockout spring tension and contains the steel adapter nut.*

8. Rotating the tool capscrew counter-clockwise, slowly release the tension of the spring as the adapter nut is removed from the valve end plate.



**KNOCKOUT  
PLUNGER**

**KNOCKOUT  
SPRING  
TOOL**

9. Remove the knockout spring tool and remove the adapter nut, compression washer, and spring.
10. Loosen the Allen setscrew in the main spool nut.
11. Remove the knockout washer from the main spool.
12. Remove the locknut, brass packing gland and packing segments from the valve end plate.
13. Remove all twelve (12) Allen head screws and lockwashers from the end plate, beginning at the center and continuing in a crossing pattern.
14. Carefully separate the end plate from the valve body and gently remove the end plate from the main spool and the knockout plunger.
15. Remove all gasket material from the valve end plate and the valve body. Clean both surfaces thoroughly. Inspect the valve end plate and valve body for abnormal wear or warpage.
16. Insert the knockout plunger steel adapter nut flush into the valve end plate, but do not tighten.
17. Align the new gasket with the valve end plate.
18. Carefully place the valve end plate and gasket over the main spool and knockout plunger and align with the valve body holes.
19. Start all twelve (12) Allen capscrews and lockwashers into the valve body.
20. Insert Leach T-B19516-4 & 7 packing tools into the knockout plunger steel adapter nut and main spool opening in the valve end plate. The packing tools will assist in aligning the valve end plate with the valve body. Incorrect alignment may interfere with the main spool and knockout plunger travel.
21. Using a crossing pattern beginning in the middle of the valve end plate, thread all twelve (12) Allen capscrews and lockwashers into the valve end plate until the lockwashers contact the valve end plate. The main spool should shift smoothly by hand.

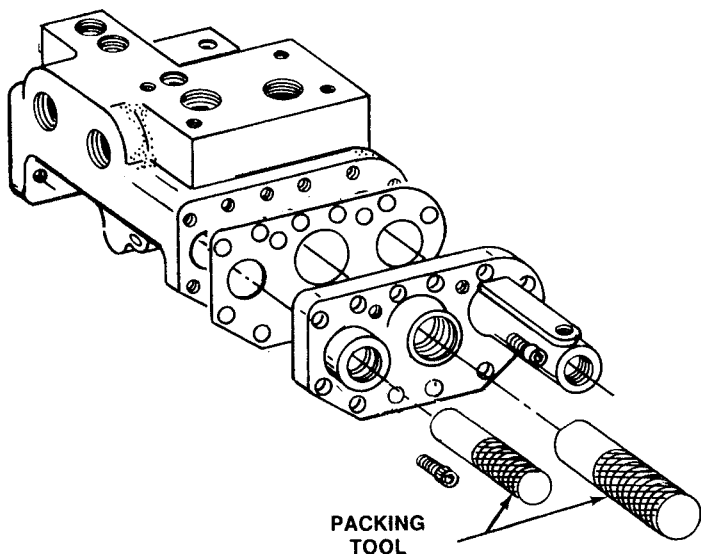
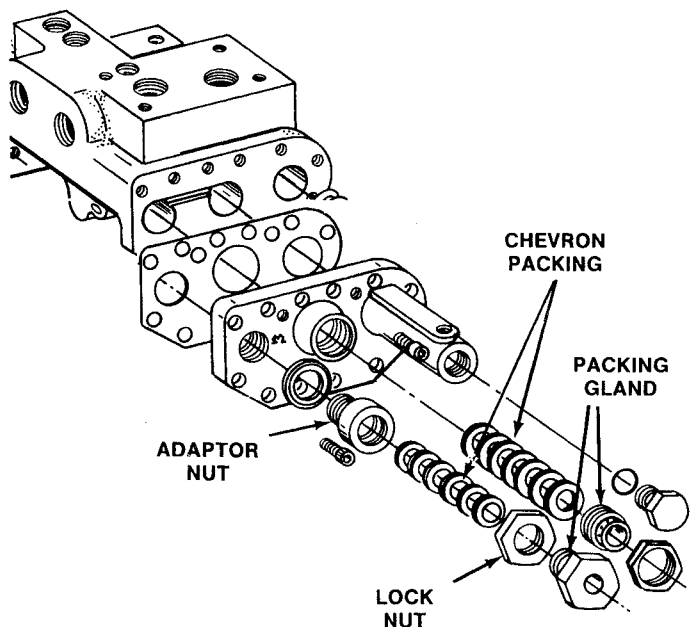
**NOTE**

*The end plate should contact the valve body evenly to avoid warping the end plate.*

22. Using a crossing pattern beginning in the middle of the valve end plate, apply final torque to all twelve (12) Allen capscrews. The main spool should shift smoothly by hand. If not, loosen the Allen head capscrews and adjust the alignment of the valve end plate.
23. Remove the Leach T-B19516-4 & 7 packing tools from the knockout plunger adapter and the main spool opening in the valve end plate.
24. Reinstall the main spool packing segments (see "V" packing section) brass packing gland, locknut, knockout collar and main spool nut.
25. Tighten the Allen set screw.

**NOTE**

*Position the set screw 180° away from the knockout pivot, rotate the main spool if necessary.*



## SERVICE AND REPAIR

26. Remove the knockout adapter nut and compression washer. Insert the knockout spring over the knockout plunger, place the knockout adapter and compression washer over the spring and plunger.
27. Install Leach T-B19516-6 knockout spring tool.
  - A. Shift the main spool completely towards the control rod.
  - B. Insert the pin of the tool into the opening of the main spool nut.
  - C. Install the tool studs into the knockout pivot assembly mounting holes of the valve end plate.
28. Place the tool cap over the end of the knockout plunger.
29. Tighten the tool capscrew against the end of the cap. Rotate the tool capscrew clockwise while tightening the steel adapter nut and compression washer.

**NOTE**

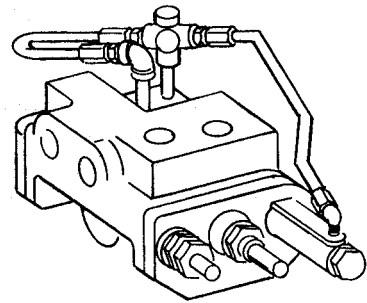
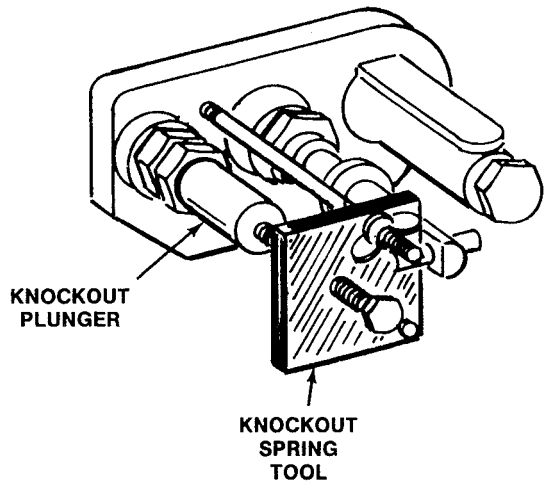
*The knockout spring must be compressed to thread and tighten the adapter nut.*

30. Remove Leach T-B19516-6 knockout spring tool.
31. Install the knockout plunger packing segments (see "V" packing section) brass packing gland, and locknut.
32. Reinstall the knockout pivot assembly.

**NOTE**

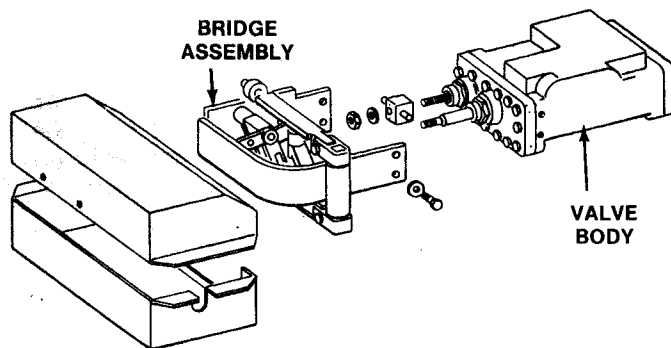
*With the main spool shifted right towards the control rod the knockout assembly adjusting bolt should have a minimum of 1/8" clearance from the knockout plunger.*

33. Reinstall the control rod into the main spool nut.
34. Reinstall the studs and cover.



**REMOVAL OF REVERSING SPRING**

1. Remove the bridge assembly covers.
2. Remove the roller arm spring.
3. Remove the four (4) capscrews from the bridge and valve body.
4. Remove the bridge assembly.



5. Remove the nut and the washer from the threaded end of the reversing plunger.
6. Remove the square block from the reversing plunger.
7. Remove the reversing plunger steel adapter nut and compression washer.

**NOTE**

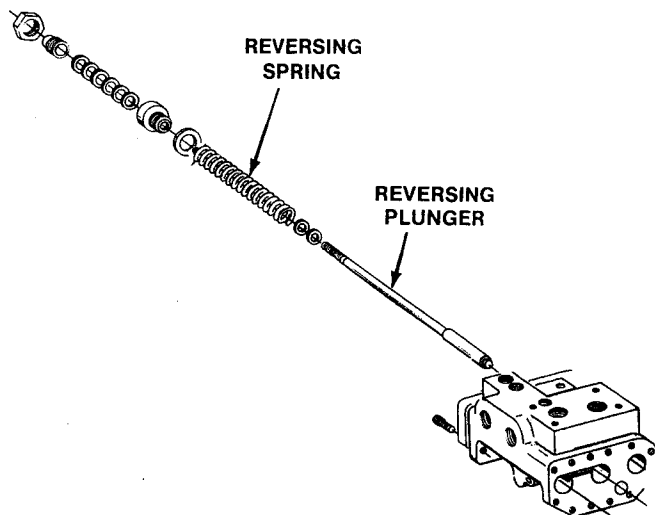
*If the Chevron packing shows no signs of leakage, the brass packing gland, locknut and packing may remain intact within the steel adapter nut.*

8. Remove the reversing spring and plunger assembly.
9. Replace the reversing spring and inspect the plunger for scoring or abnormal wear.
10. Reinsert the spring and plunger assembly.
11. Reinstall the reversing plunger steel adapter nut and compression washer.
12. Reinstall the Chevron packing (see "V" packing section) if necessary.
13. Thread the square block onto the reversing plunger with approximately an equal number of threads exposed.

**NOTE**

*The filed corner of the block should be towards the valve body and the main plunger.*

14. Place the washer over the reversing plunger.
15. Thread the nut onto the reversing plunger but do not tighten.

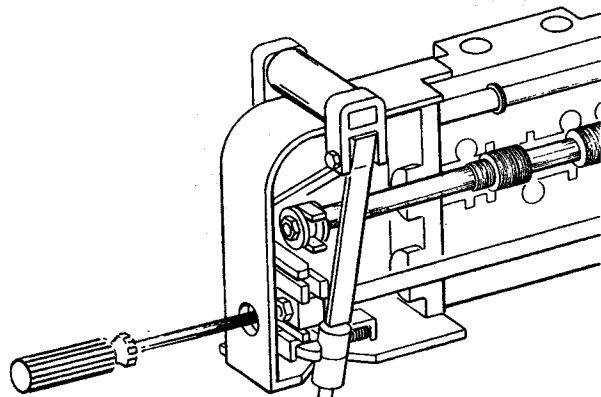


16. Install the bridge assembly.

**NOTE**

*The final position of the bridge assembly should not restrict or bind the main spool travel.*

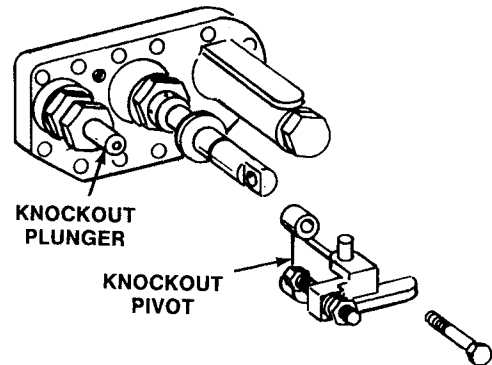
17. Use a flat screwdriver to position the square block on the plunger shaft. Insert a flat blade screwdriver into the slot on the end of the plunger. Three quarters of an inch (3/4") should be exposed between the threaded end of the reversing plunger and the square block.
18. Torque the locknut onto the reversing plunger.
19. Reinstall the roller arm spring.
20. Replace the covers.



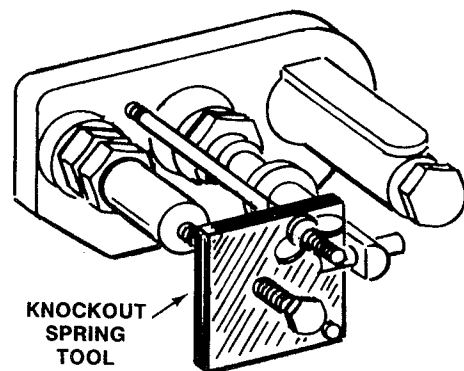
## SERVICE AND REPAIR

## REMOVAL OF THE KNOCKOUT SPRING

1. Remove the studs and the control section cover from the valve end plate.
2. Remove the control rod from the main spool nut.
3. Remove the knockout pivot assembly from the valve end plate by removing the two (2) capscrew from the valve end plate.

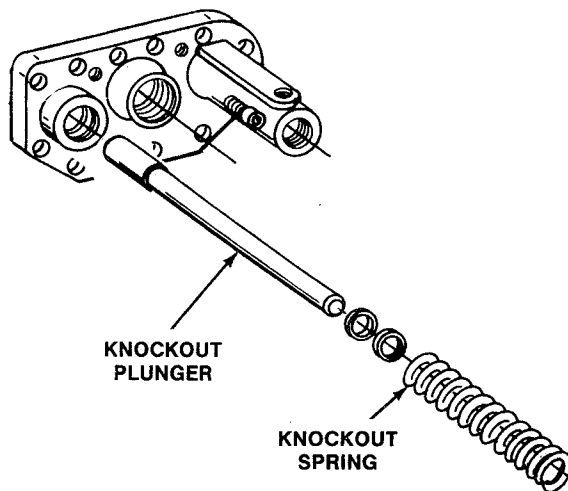


4. Install Leach T-B19516-6 knockout spring tool.
  - A. Shift the main spool completely towards the control rod.
  - B. Insert the pin of the tool into the opening of the main spool nut.
  - C. Install the tool studs into the knockout pivot assembly mounting holes of the valve end plate.
5. Place the tool cap over the end of the knockout plunger.
6. Tighten the tool hexhead capscrew against the cap.
7. Loosen the steel adapter nut and compression washer. If the Chevron packing shows no signs of leakage the brass packing gland, locknut, and packing may remain intact within the steel adapter nut.

**NOTE**

*The knockout spring is continually under tension. This tool allows controlled release of the knockout spring tension and contains the adapter nut.*

8. Rotating the tool capscrew counter-clockwise slowly releases the tension of the spring as the steel adapter nut is removed from the valve end plate.
9. Remove the knockout spring tool and remove the steel adapter nut and the compression washer.
10. Remove the knockout plunger and spring assembly.
11. Replace the knockout spring and inspect the knockout plunger for scoring or abnormal wear.
12. Reinsert the spring and plunger assembly into the valve body.
13. Place the steel adapter nut and compression washer over the knockout plunger and spring.
14. Install Leach T-B19516-6 knockout spring tool.
  - A. Shift the main spool completely towards the control rod.
  - B. Insert the pin of the tool into the opening of the main spool nut.
  - C. Install the tool studs into the knockout pivot assembly mounting holes of the valve end plate.





15. Place the tool cap over the end of the knockout plunger.
16. Tighten the tool capscrew against the cap. Rotate clockwise while tightening the knockout steel adapter nut and compression washer.

**NOTE**

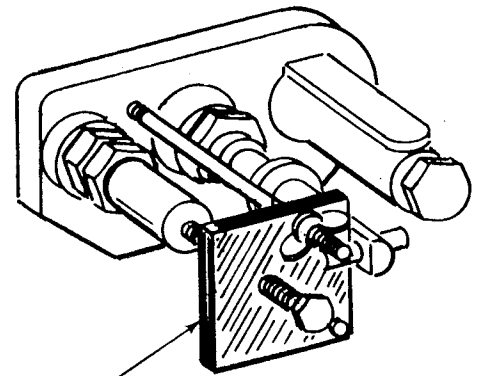
*The knockout spring must be compressed to thread and tighten the steel adapter nut.*

17. Remove the knockout spring tool.
18. Reinstall the Chevron packing (see "V" packing section) if necessary.
19. Reinstall the knockout pivot assembly.

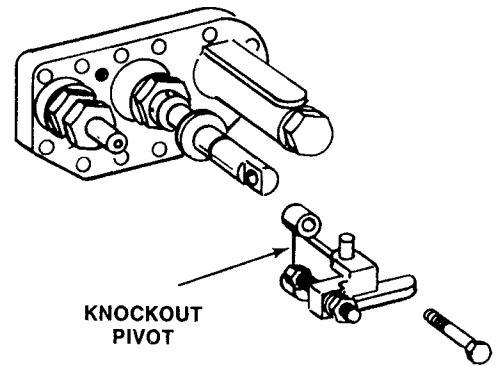
**NOTE**

*With the main spool shifted right towards the control rod the knockout assembly adjusting bolt should have a minimum of 1/8" clearance from the knockout plunger.*

20. Reinstall the control rod into the main spool nut.
21. Reinstall the studs and cover.



KNOCKOUT  
SPRING  
TOOL



KNOCKOUT  
PIVOT

**OIL JET REPLACEMENT**

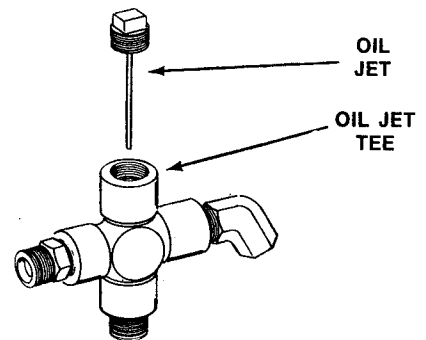
The oil jet is a meter designed to control the flow of fluid escaping from the reversing plunger chamber. The jet is inserted into a tee fitting containing an orifice fitting which is routed into a return to the tank port. To replace the oil jet:

1. Remove the pipe plug/oil jet assembly.
2. Measure the replacement oil jet.

**NOTE**

*The replacement oil jet should be approximately 1-3/4" to 1-7/8" in length.*

3. Insert the new oil jet into the fitting and tighten.



## SERVICE AND REPAIR

## CHECK VALVE REPLACEMENT

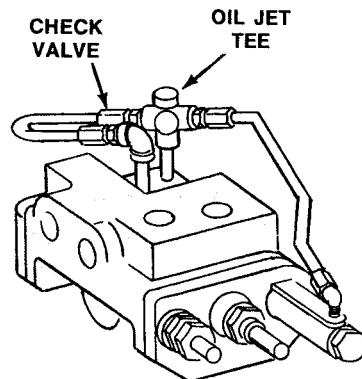
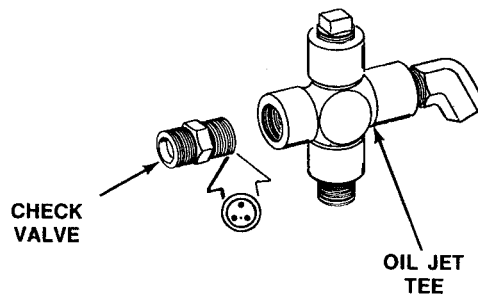
The check valve is threaded into the tee fitting containing the oil jet. The check valve insures that fluid escaping from the reversing plunger chamber is directed back into the hydraulic tank. This check valve is composed of a spring, a ball, and a backing plate.

1. Remove the "U" shaped tubing from the check valve and coupling.
2. Remove the check valve.

**NOTE**

*The check ball should be visible within the fitting. The oil jet or a paper clip may be inserted into the fitting to test the spring tension or clean the seat of the fitting.*

3. If the check valve is not intact remove the screw plug from the end of the reversing plunger chamber.
4. Inspect the cavity for the check valve components (check ball or spring pieces).
5. Lubricate the o-ring and install the screw plug.
6. Install the replacement check valve.
7. Install the "U" shaped tubing.



## MOV PRESSURE ADJUSTMENTS

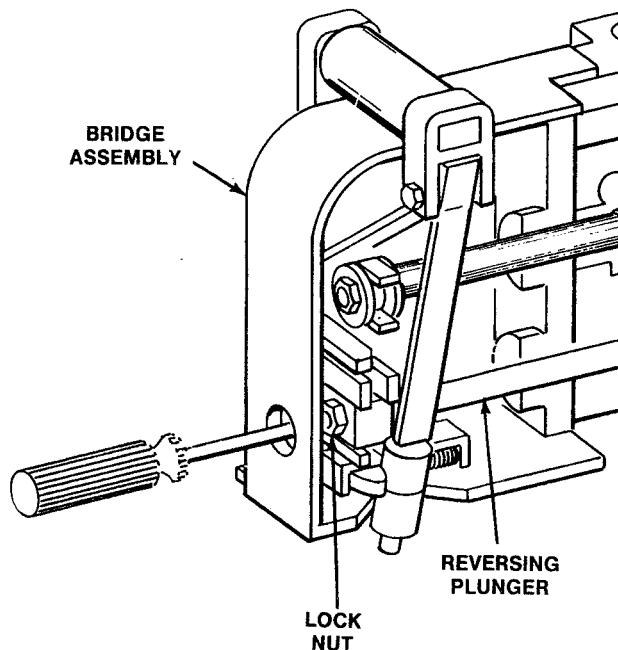
## REVERSING PLUNGER EXTERNAL ADJUSTMENT

The reversing pressure may be adjusted slightly, externally, by repositioning the square block's location on the reversing plunger. Three quarters of an inch (3/4") of exposed threads between the end of the plunger and the square block is approximately 1200 psi. To externally increase the reversing pressure:

1. Loosen the locknut on the reversing plunger.
2. Using a flat head screwdriver, rotate the reversing plunger counter-clockwise to increase the number of threads between the end of the reversing plunger and the square block. This increases the distance the reversing plunger must travel before contacting the reversing finger. The maximum adjustment is 50 psi.

**NOTE**

*Threading the square block completely onto the reversing plunger will eliminate the reversing function. Moving the square block in this direction lowers the trip finger, which may not allow the reversing function to occur.*



- To decrease reversing pressure, rotate the reversing plunger clockwise to decrease the number of threads between the end of the reversing plunger and the square block. This decreases the distance the reversing plunger must travel before contacting the reversing finger. The maximum adjustment is 50 psi.

**NOTE**

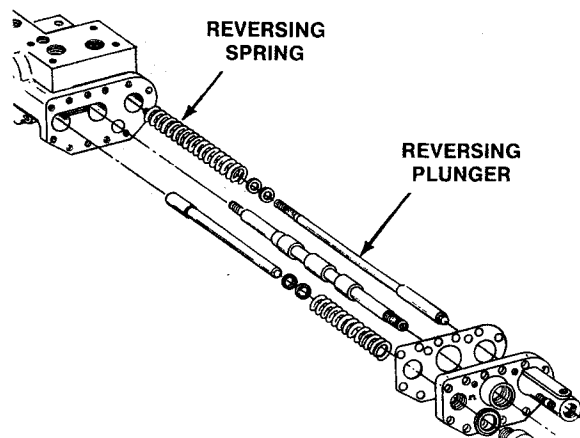
*Adjustment of the square block directly affects the height of the trip finger. Threading the square block outward raises the trip finger and may hinder or eliminate the knockout function.*

**REVERSING PLUNGER INTERNAL ADJUSTMENT**

To adjust the reversing function further, washers must be inserted internally (see reversing spring replacement). Thin washers, 1/16", approximate 25 psi and 1/8" thick washers approximate 50 psi.

**NOTE**

*No more than four (4) washers should be used or plunger travel becomes insufficient. If four (4) or more washers are required, change the reversing spring. At least 2½ washers are required at all times.*

**KNOCKOUT PLUNGER**

Slight external adjustment of the knockout pressure is possible by repositioning the capscrew located on the pivot arm of the knockout pivot assembly. The same number of threads exposed approximates 1400 psi.

**INCREASE**

- Remove the lock nut on the pivot arm.
- Thread the capscrew clockwise to increase knockout pressure. The maximum adjustment: is 50 psi.
- Install the locknut.

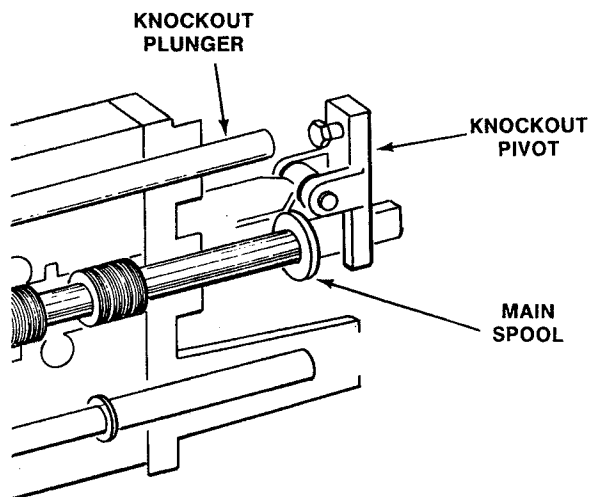
**DECREASE**

- Remove the locknut on the pivot arm.
- Thread the capscrew counter-clockwise to decrease knockout pressure. The maximum adjustment: is 50 psi.

**NOTE**

*A minimum of 1/8" clearance between the adjusting capscrew and the knockout plunger must be present.*

- Install the locknut onto the adjusting bolt.



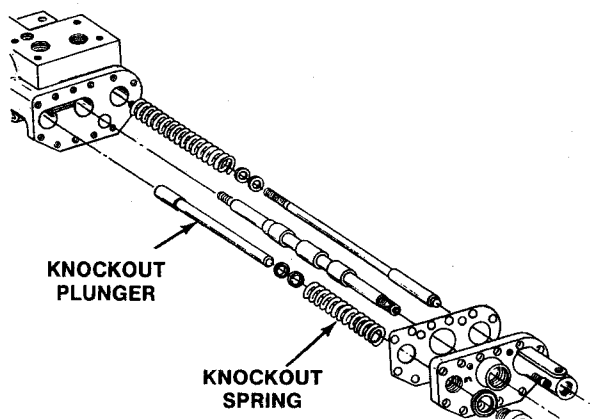
## SERVICE AND REPAIR

## INTERNAL ADJUSTMENT

To adjust the knockout function further washers must be inserted internally (see knockout spring replacement). 1/16" washers approximate 25 psi and 1/8" thick washers approximate 50 psi.

**NOTE**

*No more than four (4) washers should be used or plunger travel becomes insufficient. If four (4) or more washers are required, change the knockout spring. At least 2 washers are required at all times.*



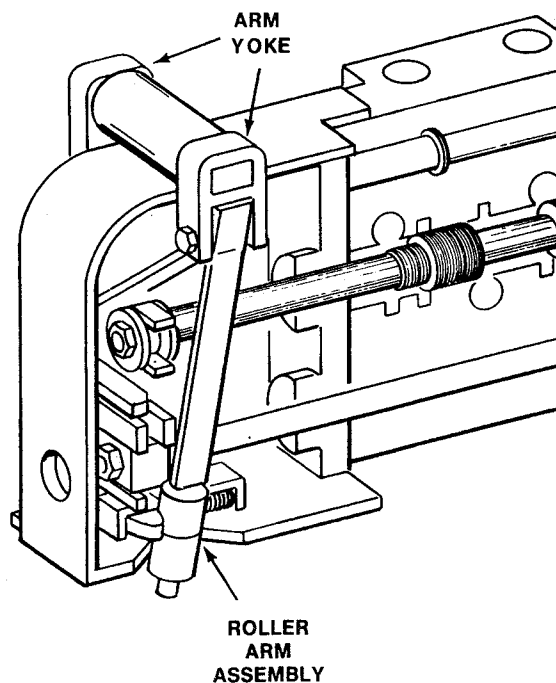
## BRIDGE ASSEMBLY MECHANICAL INSPECTION AND ADJUSTMENT

## ROLLER ARM ASSEMBLY AND MAIN SPOOL

The upper and lower roller arms are connected to upper and lower arm yokes by means of capscrews which are threaded into the arm yokes. Nylock nuts are threaded onto the ends of the capscrews. The upper roller arm is beveled at the arm yoke and contains twin rollers. The outer roller rides on the bridge and the inner roller provides a contact surface for the trip finger. The lower roller arm is square at the arm yoke and contains a single roller which rides on the bridge. The upper and lower arm yokes are connected by an arm yoke pin. This pin allows a limited distance of travel for the upper and lower roller arms. The main spool is connected to the roller arms by the main spool yoke and collar.

## INSPECTION

1. Remove the roller arm spring. The spring tension should be strong. If not, see repair #1.
2. The upper and lower roller arms should move freely up and down. If not, see repair #2.
3. The upper and lower roller arms should move evenly together and rollers ride on the bridge "steps." If not, see repair #3. Little or no side play should be present.
4. The arm yokes should be tight on the arm yoke pin. If not, see repair #4.
5. The rollers should not be excessively worn. If worn, see repair #5.
6. The main spool collar and yoke should pivot freely. The main spool should shift smoothly by hand. If not, see repair #6.
7. The transition from "notch" to "step" on the bridge should be clean. If not, see repair #7.



**REPAIR**

1. Replace the spring.
2. Loosen the capscrew until the arms move freely up and down.
3. Tighten the capscrew until side play is removed, but arms still hang freely.  
Remove the upper and lower arms and bend both until they are parallel and required travel is achieved.
4. A. Place the arms in the neutral position.  
B. Flatten the ends of the arm yoke pin.  
C. Spot weld the arm yoke to the arm yoke pin.

**NOTE**

*The upper roller arms must face the notched section of the bridge.*

**NOTE**

*Do not continuous weld the arm yoke to the arm yoke pin.*

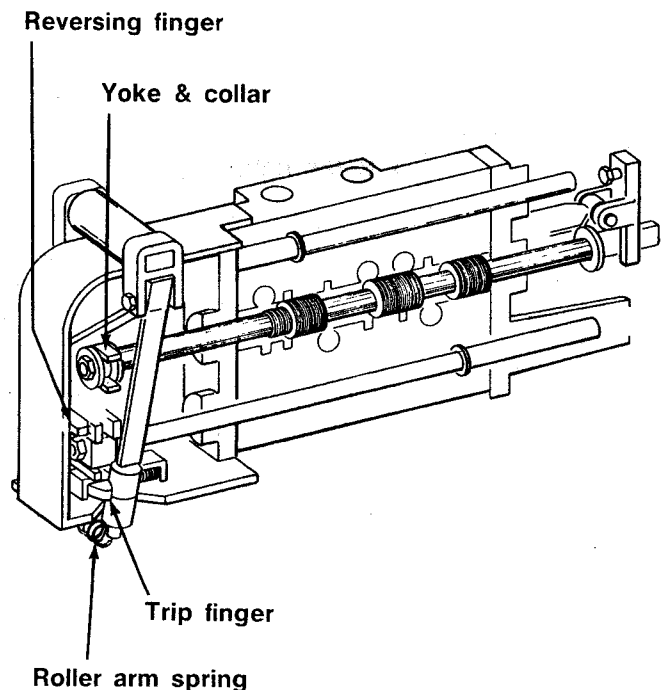
5. Replace the rollers.
6. Reduce the torque on the main spool locknut.  
Position the stake mark towards the square block.
7. Replace the bridge.

**REVERSING MECHANICAL COMPONENTS**

The reversing plunger drives the square block which rides inside the pivot block/trip finger assembly.

**INSPECTION**

1. The square block should ride smoothly with the channels of the pivot block. If not see repair #1.
2. The trip finger should contact the inside roller during the reversing function and rest slightly below the roller after completion of the reversing function. The trip finger should show no signs of excessive wear. If not see repair #2 and #3.
3. The reversing finger should pivot freely on the mounting capscrew, and show no signs of excessive wear. If not see repair #4 and #5.



**SERVICE AND REPAIR****REPAIR**

1. Replace the pivot block.
2. Adjust the height of the trip finger by rotating the reversing plunger. Counter-clockwise rotation of the reversing plunger lowers the trip finger, clockwise rotation raises the trip finger.

**NOTE**

*Rotation of the reversing plunger repositions the square block and affects reversing pressure.*

3. Replace the trip finger.

**NOTE**

*The replacement trip finger may require minor adjustments.*

4. Reduce the torque on (no pivot) the mounting capscrew.
5. Replace the trip finger.

**NOTE**

*If all the components exhibit excessive wear replace the entire bridge assembly.*

**KNOCKOUT MECHANICAL COMPONENTS**

The knockout plunger drives the knockout pivot into the main spool washer and shifts the main spool into neutral. To inspect, remove the control section cover and shift the main spool to the right.

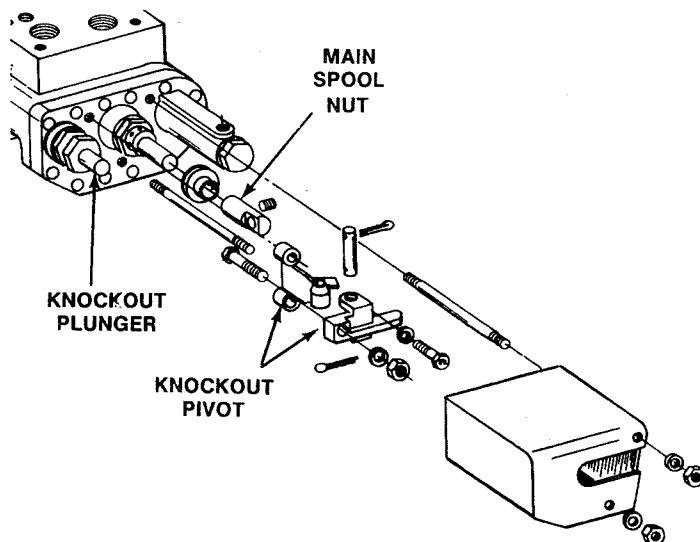
**INSPECTION**

1. The knockout pivot assembly should be firmly mounted to the valve end plate. If not see repair #1.
2. A minimum of 1/8" clearance should be present between the knockout plunger and pivot arm capscrews. If not see repair #2 & 3.

**NOTE**

*Standard position is an equal number of threads exposed.*

3. The opening in the main spool nut should not show signs of excessive wear. If not see repair #4.
4. The main spool washer should not show signs of excessive wear. If not see repair #5.
5. The main spool nut Allen set screw should be 180° from the pivot arm. If not see repair #6.



**REPAIR**

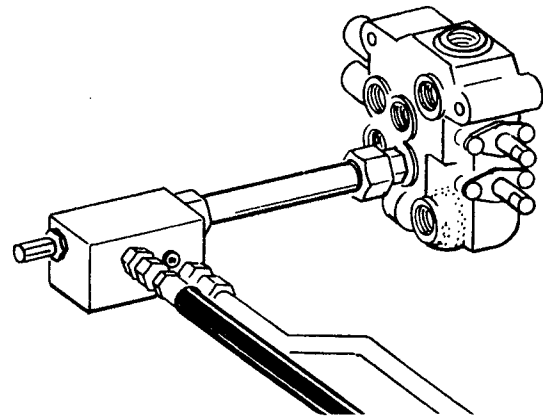
1. Replace the knockout pivot assembly capscrews and properly torque.
2. Remove the locknut and adjust the capscrew. Clockwise rotation increases clearance, counter-clockwise rotation decreases clearance.
3. Replace the capscrew and install locknut.
4. Replace the main spool nut.
5. Replace the main spool washer.
6. Rotate the main spool 180° to clear the knockout pivot arm.

**DESCRIPTION AND REMOVAL OF SPC VALVE**

SPC stands for Sequence Pilot Check. It is a valve block with a Sequence Valve in a cartridge form which is pre-set at the factory to control the sequence and timing of the clamping system.

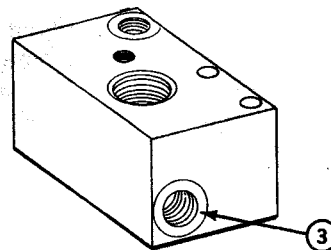
The Pilot Check portion of the valve is also built in. It maintains the clamp mechanism in a locked position and does not allow the clamp cylinder to bleed off until the pushout lever is shifted.

1. To remove the SPC Valve disconnect all hydraulic lines at valve and cap.
2. Remove Valve body to a work bench area so further examination can be done if necessary.



**SERVICE AND REPAIR****DISASSEMBLY OF SEQUENCE VALVE CARTRIDGE.**

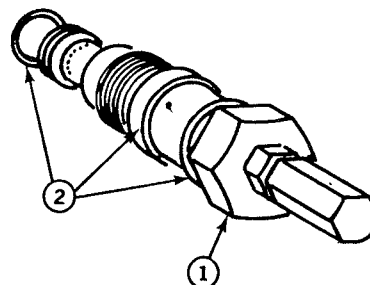
1. Wash the area around the Sequence cartridge with solvent to prevent contamination.
2. Turn the Sequence cartridge nut (1) counter-clockwise until the cartridge can be removed.
3. Replace cartridge with a new one if defective. See Sec. 7 CHECK OUT, check sequence valve pressure.
4. If just the o-rings (2) are bad, use a seal kit to replace.
5. If a valve cartridge is not readily available for replacement, plug or cap the threaded orifice (3) to prevent contamination until one is available.

**NOTE**

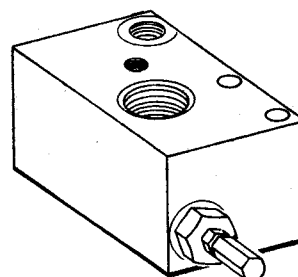
*Do not operate Packer without cartridge installed.*

**INSPECTION AND REPLACEMENT OF SEQUENCE CARTRIDGE**

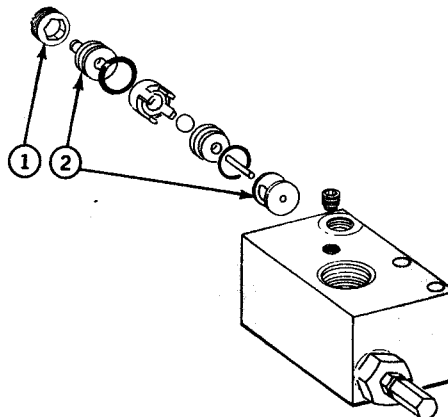
1. Inspect all parts for damage or excessive wear (replace defective parts).
2. Replace all O-rings every time cartridge is removed.

**REASSEMBLY AND INSTALLATION OF SEQUENCE VALVE**

1. If replacing cartridge with a new one, insert it into valve body and snug it down.
2. If replacing the O-rings, first remove old O-rings, clean cartridge thoroughly and then coat the valve with hydraulic fluid before sliding on the new O-rings.
3. Re-insert valve cartridge into valve body and snug down.

**DISASSEMBLY OF PILOT CHECK**

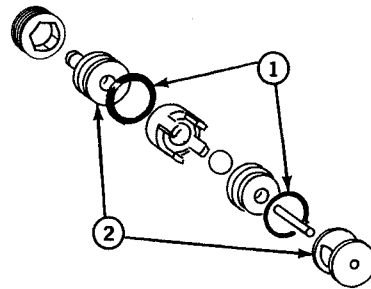
1. Wash the area around the Pilot plug with solvent to prevent contamination.
2. Remove the Pilot cap with a 5/8" Hex wrench (1).
3. Remove the internal components as shown (2).





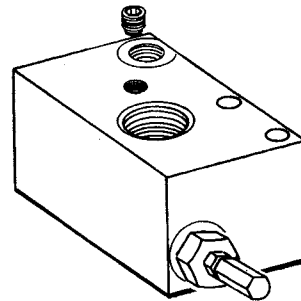
## INSPECTION AND REPLACEMENT OF PILOT CHECK

1. Inspect all parts for damage or excessive wear, replace defective parts.
2. Replace all O-rings every time the Pilot check is disassembled (1).
3. If any part of the Pilot check is worn, excluding the O-rings the complete assembly must be replaced (2). Only the O-rings can be replaced separately.



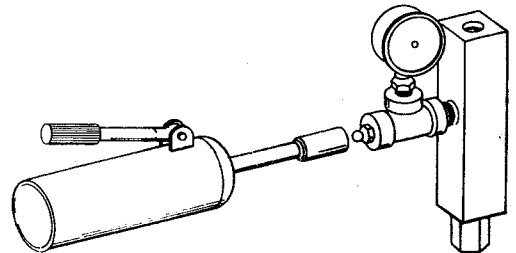
## REASSEMBLY AND INSTALLATION OF PILOT CHECK

1. When replacing the complete assembly or just the O-rings, always check components for sharp edges or burrs.
2. Coat all parts with hydraulic fluid before inserting them into valve body.
3. Reassemble the parts in the reverse order of disassembly.



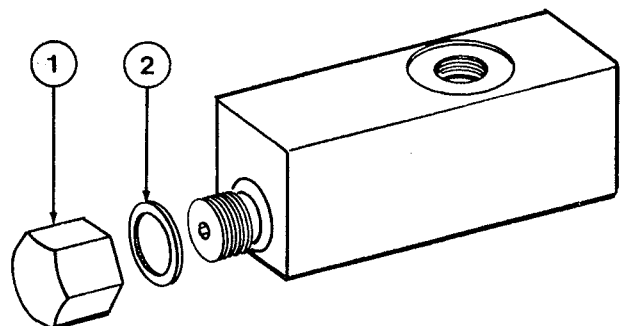
## TEST/ADJUSTMENT OF 3000 LB. RELIEF VALVE

1. Remove relief valve from unit and cap hydraulic lines.
2. Connect valve to a test set-up as shown.
3. Pump Port-a-Power and watch pressure gauge. Valve should crack at 3000 PSI.



## IF NOT:

4. Remove acorn nut (1) and seal (2).
5. Adjust setscrew to achieve pressure relief (valve cracks) at 3000 PSI. Replace valve assembly if relief can not be obtained.
6. Re-install seal (2) and acorn nut (1). Torque to 35 ft. lbs.
7. Clean valve and re-install in unit.

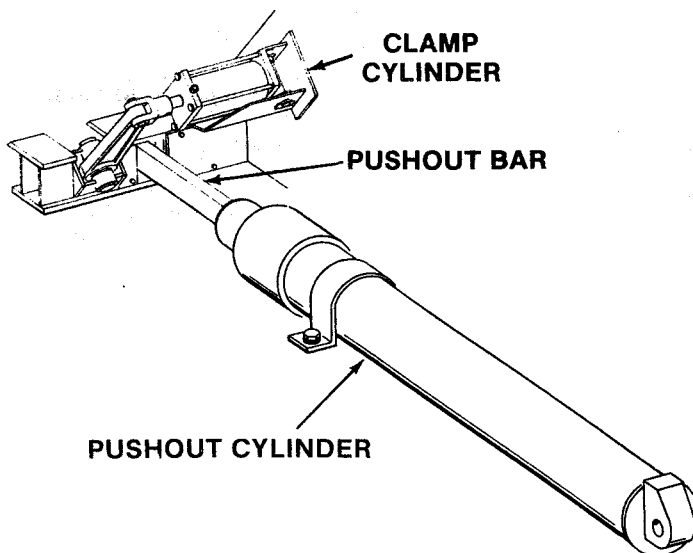


**SERVICE AND REPAIR**

**DESCRIPTION OF PUSHOUT CYLINDER**

This hydraulic cylinder works in conjunction with the clamp cylinder to provide the rearward motion of the pushout plate during the unloading cycle.

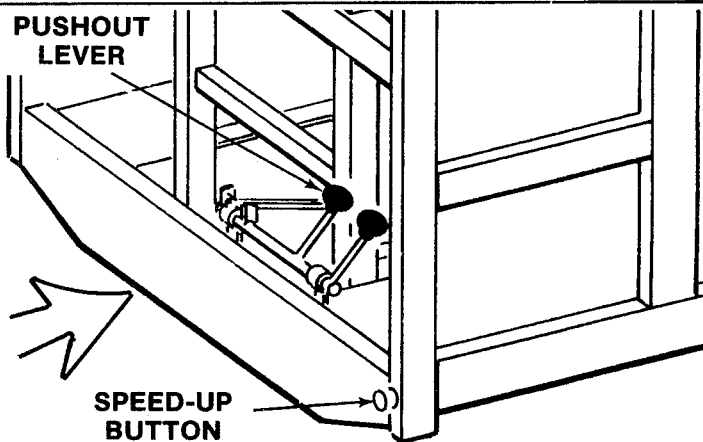
First, the pushout cylinder rod, which is connected to the pushout bar, is fully retracted into the pushout cylinder. Next the clamp cylinder is engaged, locking the pushout plate to the pushout bar. Then the pushout cylinder is extended causing the pushout plate to move rearward toward the tailgate opening. At the end of the cylinder stroke the clamp cylinder is released allowing the pushout cylinder to be retracted and leaving the pushout plate where it was at the end of the last stroke. This cycle can be repeated as many times as necessary to push out the load.



**TEST FOR LEAKING PUSHOUT CYLINDER PISTON CUPS**

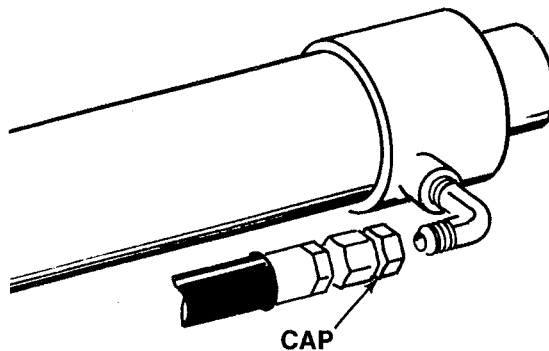
Operational Status					
Truck	Running	PTO	Engaged	Sol. Sw.	On

1. Depress speed-up button and move pushout lever (rearward) to fully extend the pushout cylinder.



Operational Status			
Truck	Off	Keys	Removed

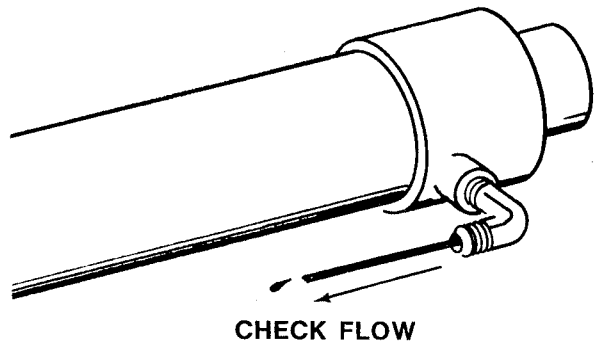
2. Disconnect and cap hydraulic line at the rod end of the pushout cylinder.



Operational Status				
Truck	Running	PTO	Engaged	Sol. Sw. On

- Again depress speed-up button and move pushout lever (rearward) as if extending pushout cylinder. Hold lever in this position while observing oil flow from open cylinder port.

The flow of hydraulic fluid should be no more than 12 fluid ounces per minute. A flow greater than 12 ounces indicates an excessive piston seal leak. If cylinder does not leak excessively, continue test.

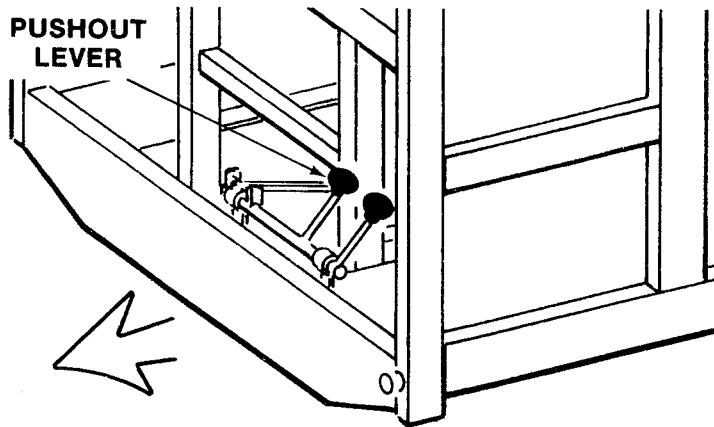


Operational Status			
Truck	Off	Keys	Removed

- Reconnect the hydraulic line to the rod end of the pushout cylinder.

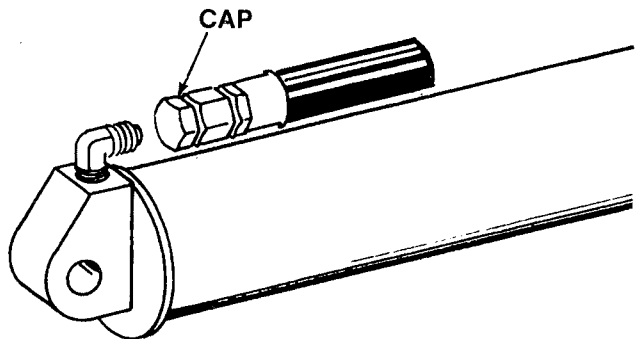
Operational Status				
Truck	Running	PTO	Engaged	Sol. Sw. On

- Pull the pushout lever toward the front of the truck to fully retract the cylinder.



Operational Status			
Truck	Off	Keys	Removed

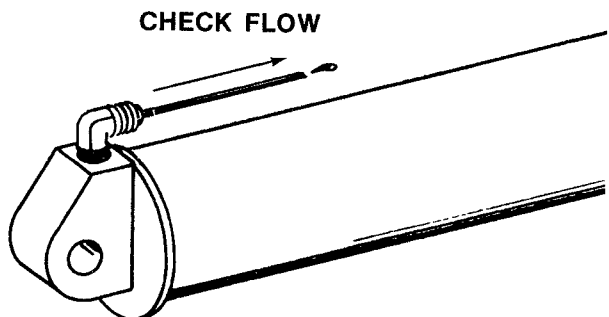
- Disconnect and cap the hydraulic line at the cylinder end of the pushout cylinder.



Operational Status				
Truck	Running	PTO	Engaged	Sol. Sw. On

- Pull and hold the pushout lever (forward) as if to retract the pushout bar and observe the oil flow from the open cylinder port.

The flow of hydraulic fluid should be no more than 12 fluid ounces per minute. A flow greater than 12 ounces indicates an excessive piston seal leak. Disassemble cylinder and replace piston seal as described later in this section.



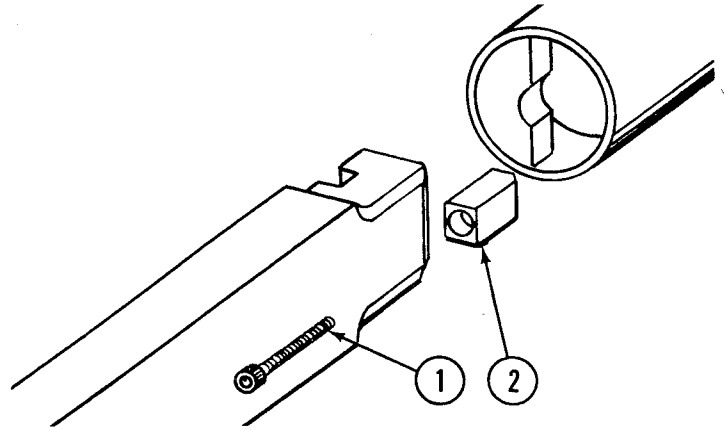
## SERVICE AND REPAIR

### REMOVAL OF PUSHOUT CYLINDER

#### Operational Status

Truck	Off	Keys	Removed
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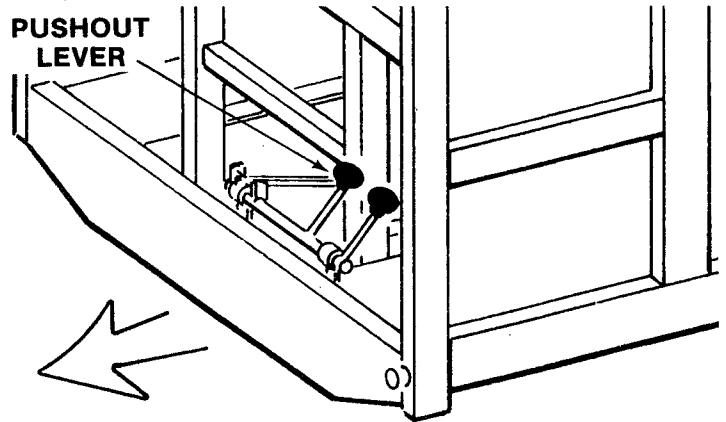
1. Remove nylock socket head capscrew (1) and push-out bar holder (2) from pushout cylinder piston rod.
2. Disengage bar from lock in head of piston rod.



#### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
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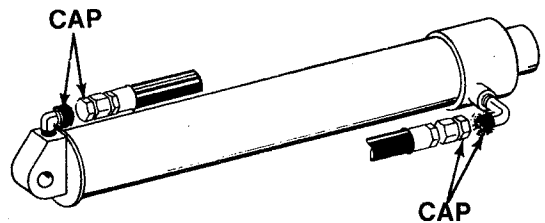
3. Pull back on the pushout lever to fully retract the pushout cylinder.



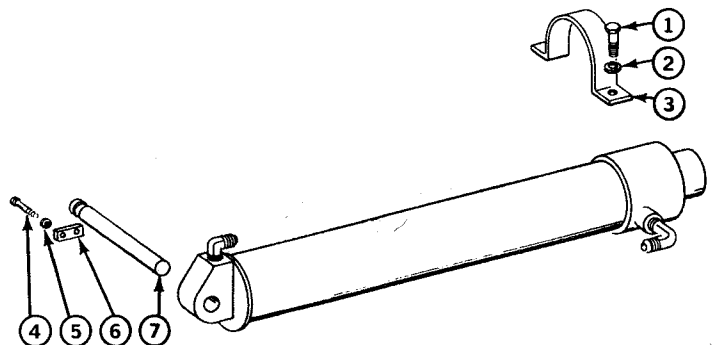
#### Operational Status

Truck	Off	Keys	Removed
-------	-----	------	---------

4. Disconnect the two hoses, fittings and elbow from the push-out cylinder. Cap and plug hoses and cylinder ports.



5. Remove capscrews (1), lockwashers (2), strap (3).
6. Remove capscrew (4), keeper plate (5) locking plate (6).
7. Remove cylinder end pin (7).

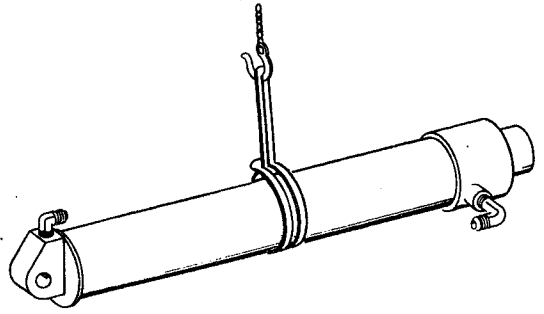


- Secure a nylon sling around cylinder as shown and attach to a suitable lifting device with a lifting capacity of 500 lbs.

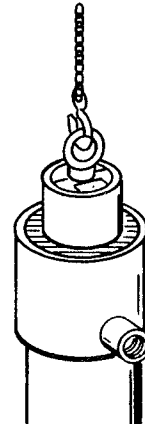
**NOTE**

See Sec. 4, *GENERAL REPAIR PRACTICES*, for more detailed information about the correct use of slings and lifting chains.

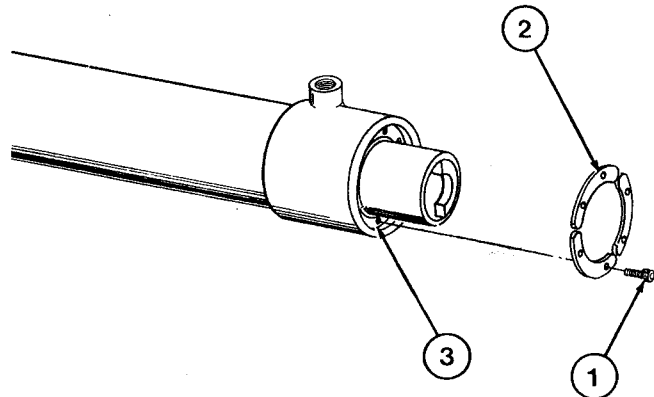
- Remove cylinder from truck body using care to avoid damaging surrounding hydraulic lines.

**DISASSEMBLY OF PUSHOUT CYLINDER**

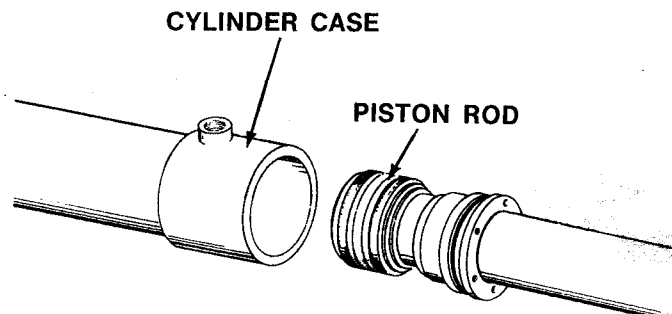
- Clean the outside of the cylinder with solvent to prevent the entry of dirt during disassembly.
- Remove plugs from cylinder ports and drain hydraulic fluid.
- Secure the case end of the operating cylinder to the floor or workbench.
- Secure the rod end of the cylinder to an overhead hoist or other suitable lifting mechanism with a minimum lifting capacity of 500 lbs.



- Remove the six nylon screws (1) and three lock segments (2) securing the gland head (3) to the cylinder.

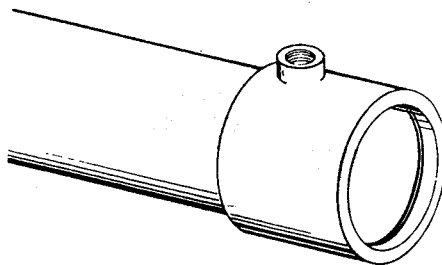


- Slowly operate the hoist to carefully pull the piston rod assembly out of the cylinder.
- Disassemble cylinder parts only as far as necessary to install replacement parts.



**SERVICE AND REPAIR****INSPECTION AND REPLACEMENT OF  
PUSHOUT CYLINDER**

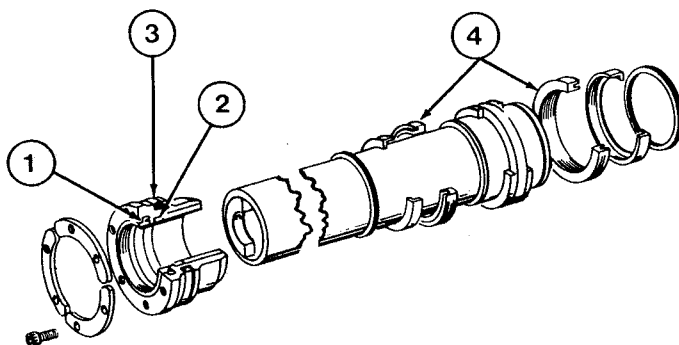
1. Carefully and thoroughly inspect the inside of the cylinder for cracks, scoring or uneven wear. Check all parts for damage.



2. A new rod wiper (1), rod seal (2), o-ring (3) and u-cups (4) must be installed anytime the cylinder is disassembled. Pay particular attention to the way parts are positioned for correct assembly. Parts that must be replaced together are available as a Repair Kit from your dealer.

**NOTE**

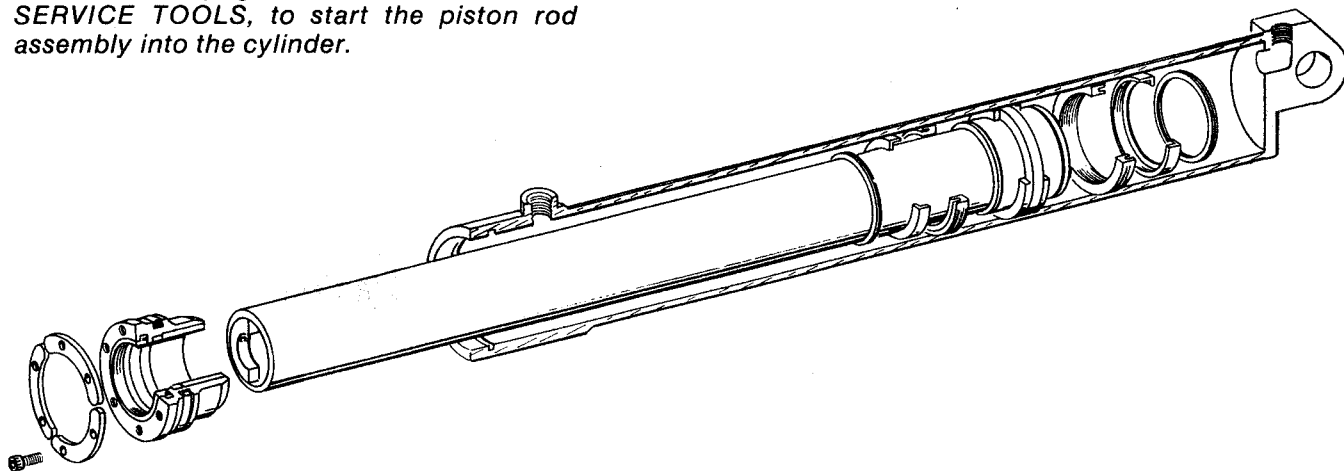
*If cylinder is not to be installed immediately, keep ports sealed to prevent dirt from entering cylinder.*

**REASSEMBLY AND INSTALLATION OF  
PUSHOUT CYLINDER**

Reassemble and install the pushout cylinder in the approximate reverse order of disassembly.

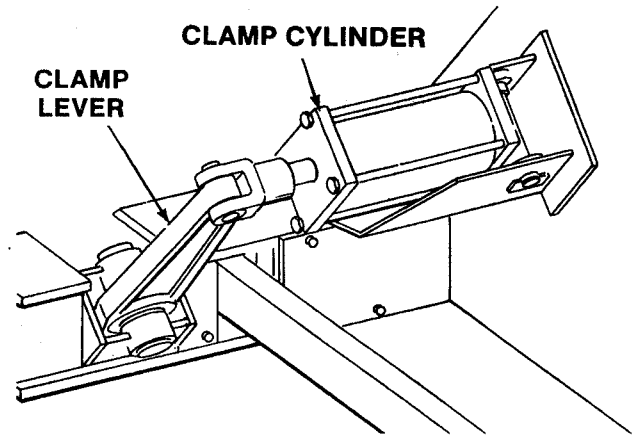
**NOTE**

*Use the u-cup guide listed in Sec. 11, SERVICE TOOLS, to start the piston rod assembly into the cylinder.*



**DESCRIPTION OF CLAMP MECHANISM**

The clamp mechanism in conjunction with the clamp cylinder "locks" or clamps the pushout plate to the pushout bar. The plate is automatically "clamped" during the unloading operation prior to the pushout cylinder being extended. Proper maintenance of the clamp mechanism is important to achieve proper loading and unloading of the unit. If the pushout bar begins to slide through the pushout clamp mechanism while pushing out or packing, check for wear.



**WEAR POINTS**

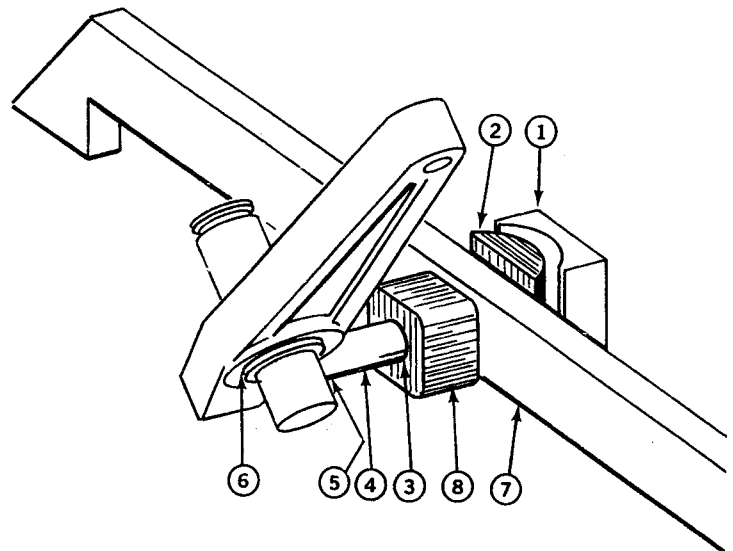
The clamping mechanism has 8 wear points that should be checked periodically or whenever the pushout bar starts slipping.

Operational Status			
Truck	Off	Keys	Removed

1. Socket clamp shoe.
2. Clamp shoe.
3. Pushout clamp block (pin contact area).
4. Clamp pin.
5. Pivot arm (Pin contact area).
6. Pivot arm (bushing).
7. Pushout bar worn.
8. Pushout clamp block.

**NOTE**

*These parts can be more closely inspected if the clamp mechanism is removed.*

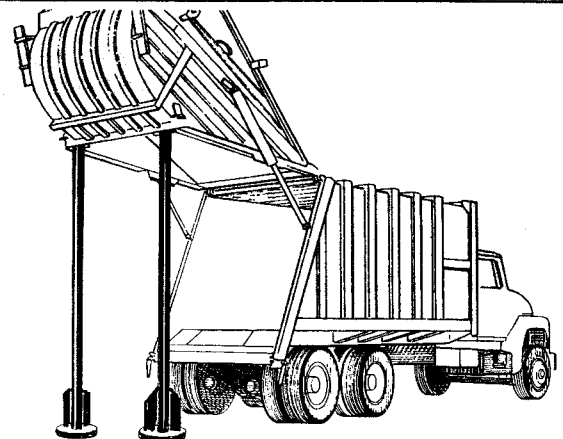


Wear in the above areas, if not excessive, can be compensated for by adding shims.

**DISASSEMBLY AND REMOVAL OF CLAMP MECHANISM**

Operational Status				
Truck	Running	PTO	Engaged	Sol. Sw. On

1. With the Packer empty raise the tailgate and support it as shown.



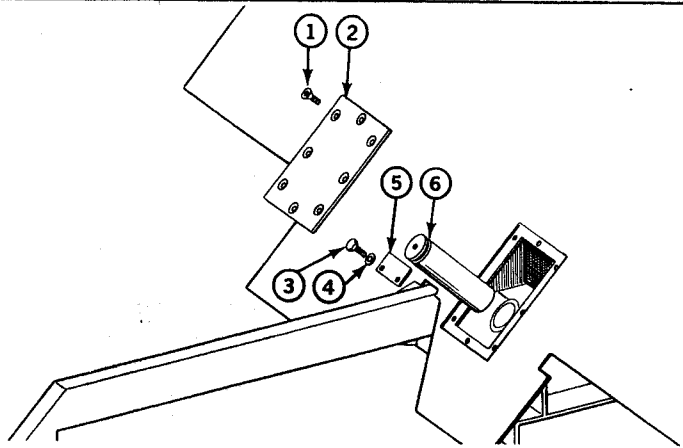
# SECTION 9

## SERVICE AND REPAIR

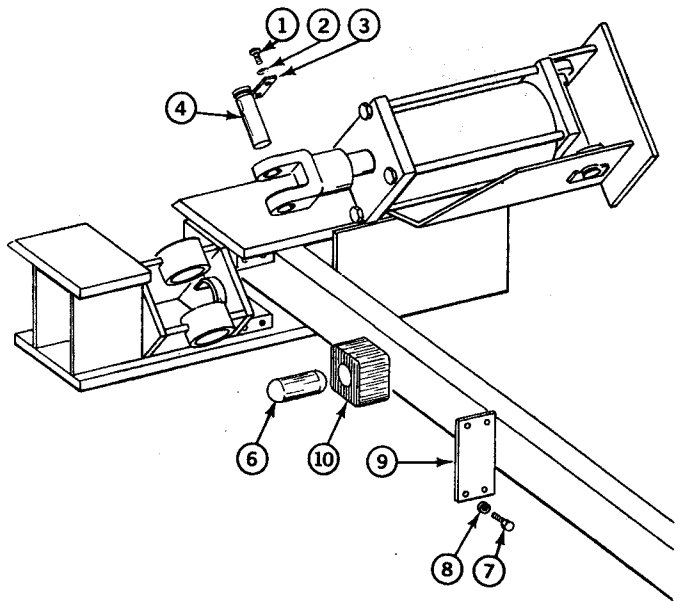
### Operational Status

Truck	Off	Keys	Removed

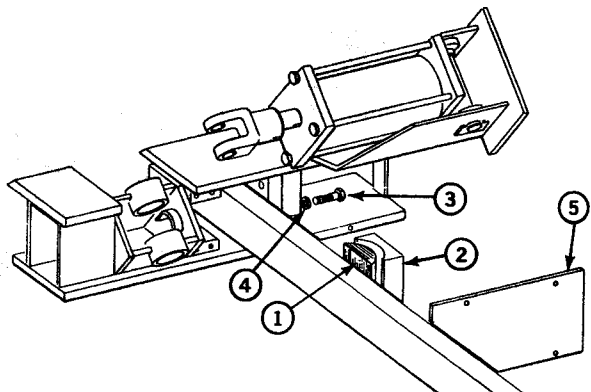
2. Pull the pushout plate to mid-point position by use of a come-a-long.
3. Remove the 8 capscrews (1) and the access hole cover plate (2).
4. Remove the 2 capscrews (3), 2 lockwashers (4) and keeper plate (5).
5. Remove the pivot arm pin (6) with a 3/8" pin puller.



6. To disassemble the remaining portion of the clamp mechanism, remove the 2 capscrews (1), 2 lockwashers (2) and keeper plate (3).
7. Remove the yoke pin (4) with a 3/8" pin puller. Now the pivot arm can be lifted out. The clamp pin is also now loose and can be removed (6).
8. To replace or examine the clamp block remove the 4 capscrews (7) and 4 lockwashers (8) and cover (9). The block (10) can now be removed.



9. To examine the clamp shoe (1) and shoe socket (2) remove the 4 capscrews (3) and 4 lockwashers (4).
10. To remove the clamp shoe (1) and shoe socket (2) you must first take off the cover plate (5). To do this, remove the 4 capscrews and 4 lockwashers.

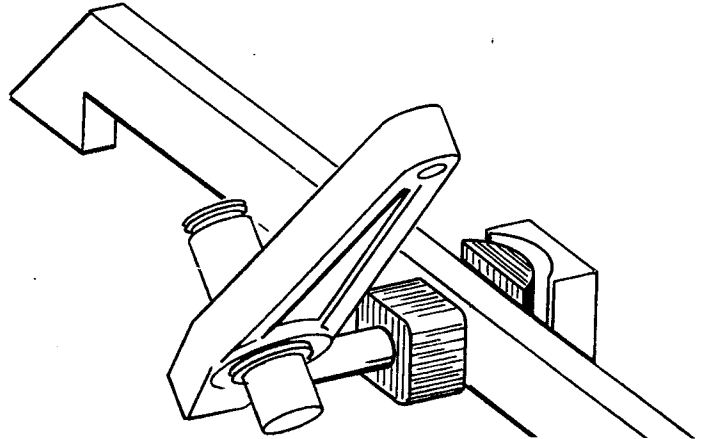




SERVICE AND REPAIR

**INSPECTION AND REPLACEMENT OF CLAMP MECHANISM**

Replace all excessively worn parts as determined by checking wear points.

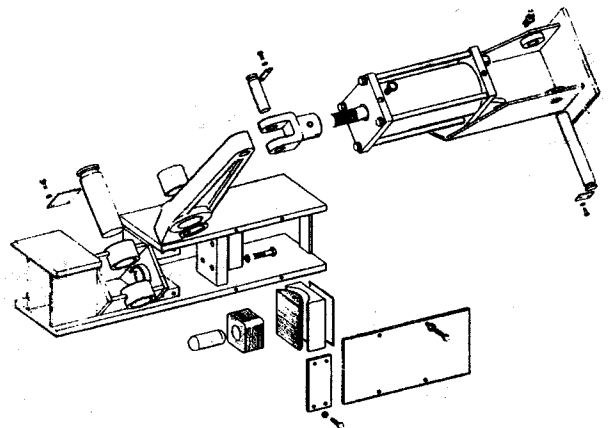


**REASSEMBLY AND INSTALLATION OF CLAMP MECHANISM**

1. Reassemble and install parts in the reverse order of disassembly.

**NOTE**

*Make sure that after the clamp mechanism is replaced the pivot is thoroughly greased.*

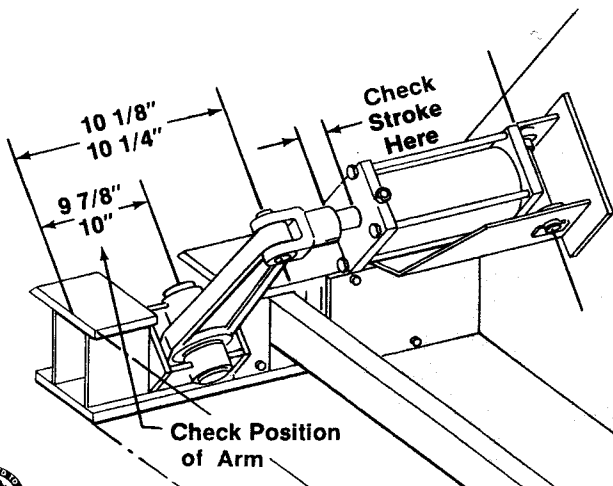


**CLAMP ADJUSTMENT**

Follow the illustrations below for proper clamp adjustments.

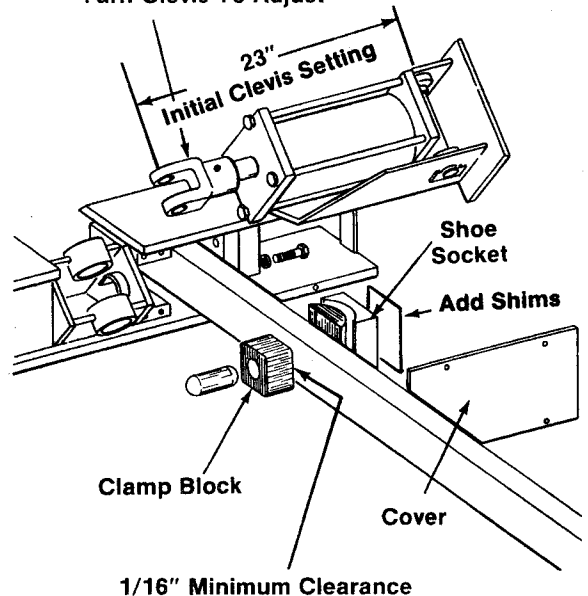
1. Check clamp cylinder stroke, adjust if necessary 1-1/8" maximum.
2. Check lever arm position.
3. Check pushout bar, clearance 1/16", shim if necessary.
4. Test.

Follow all safety precautions as stated in this Service Manual.



Operational Status			
Truck	Off	Keys	Removed

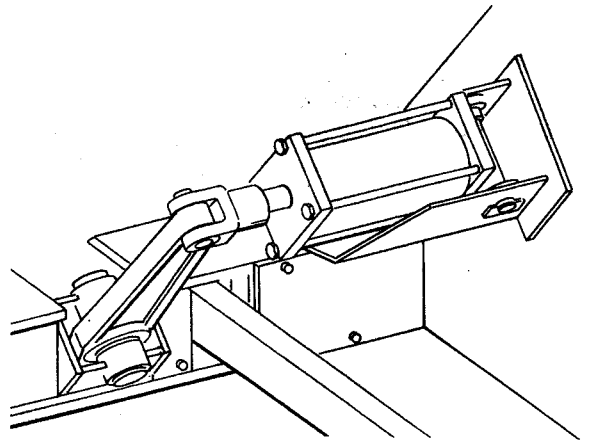
Loosen Set Screw  
Turn Clevis To Adjust



## SERVICE AND REPAIR

### DESCRIPTION OF CLAMP CYLINDER

This hydraulically operated, single-acting cylinder is mounted on the pushout plate. It provides the force necessary to clamp the pushout plate to the pushout bar during the pushout cylinder extension stroke (ejecting the load). The internal clamp spring releases the clamping action once hydraulic pressure is released.

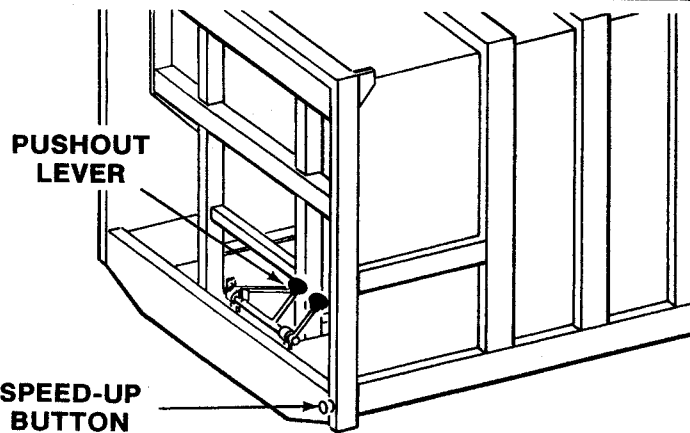


### TEST FOR LEAKING CLAMP CYLINDER PISTON CUP

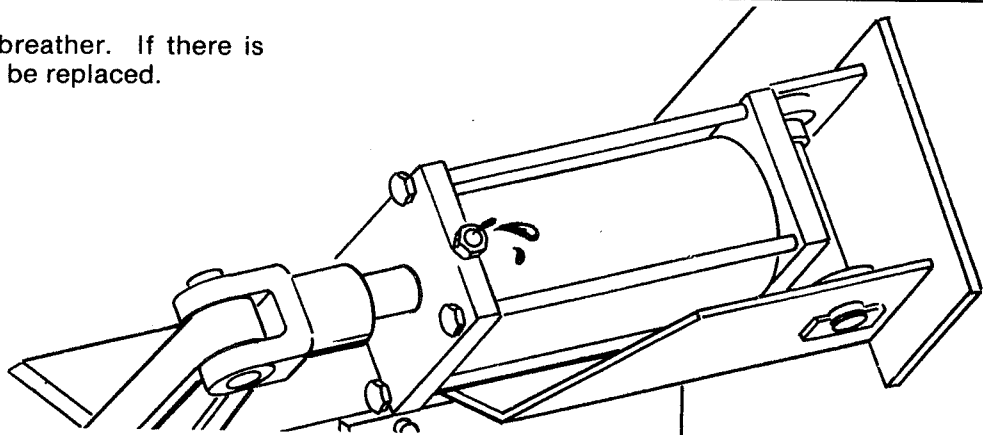
#### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
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1. Depress speed-up button. Move and hold pushout lever (rearward) to pressurize clamp cylinder.



2. Watch for oil leaking from breather. If there is leakage, the piston cup must be replaced.

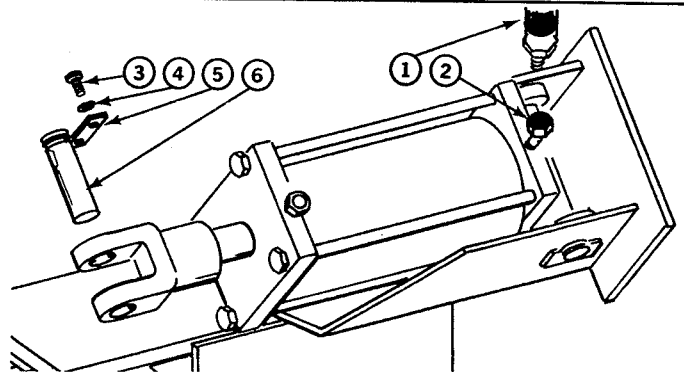


### REMOVAL OF CLAMP CYLINDER

#### Operational Status

Truck	Off	Keys	Removed
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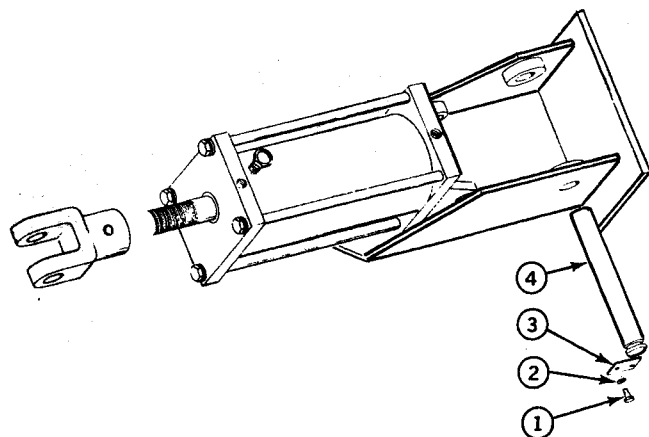
1. With the Packer empty and the clamp released, remove the hydraulic hose (1) from the cylinder end (2) and plug cylinder fitting.
2. Next remove the 2 capscrews (3) and 2 lock-washers (4) from the rod end. Now remove the keeper plate (5) and yoke pin (6). If necessary use a 3/8" pin puller inserted into the end to pull the pin out.



**NOTE**  
Support cylinder before removing pin.

- To disconnect the cylinder case end, remove the 2 capscrews (1) 2 lockwashers (2) and keeper plate (3). If necessary to remove the clamp cylinder pivot pin (4) insert a 3/8" x 3" capscrew into the end of the pin and use a pry bar to remove it.

The cylinder can now be removed. The cylinder weight is approximately 115 lbs. It's advisable to have 2 mechanics lift and remove the cylinder.

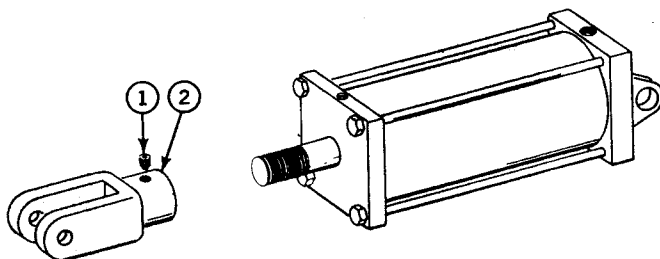


## DISASSEMBLY OF CLAMP CYLINDER

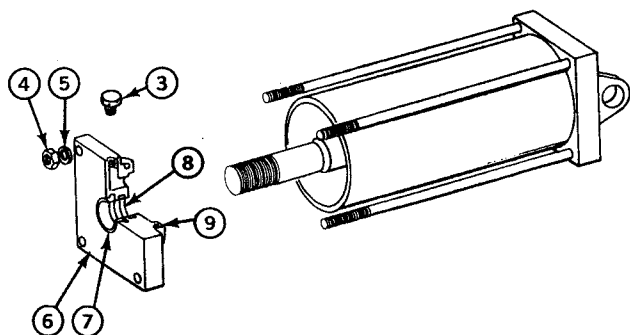
- Wash outside of cylinder with solvent to prevent dirt from entering cylinder during disassembly.
- Remove setscrew (1) and rod eye (2).

### CAUTION

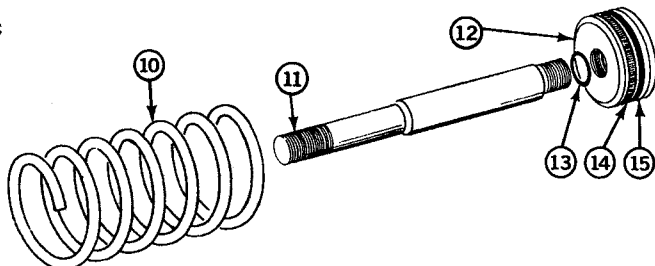
Cylinder is under spring compression. Care should be used when disassembling by loosening nuts carefully, and therefore relieving spring tension safely.



- Remove breather plug (3) and drain fluid.
- Unscrew the 4 hex nuts (4) and remove the 4 lockwashers (5).
- Pull off the cylinder cover (6).
- Pry out the rod wiper seal (7) rod wiper ring (8) and o-ring (9).



- With the cylinder securely anchored to bench, pull out the piston rod assembly.
- Remove compression spring (10).
- Unscrew the piston rod (11) from the piston disc (12) and remove the rod o-ring (13).
- Remove the wear ring (14) piston seal (15).



## SECTION 9

### SERVICE AND REPAIR

#### INSPECTION AND REPLACEMENT OF CLAMP CYLINDER

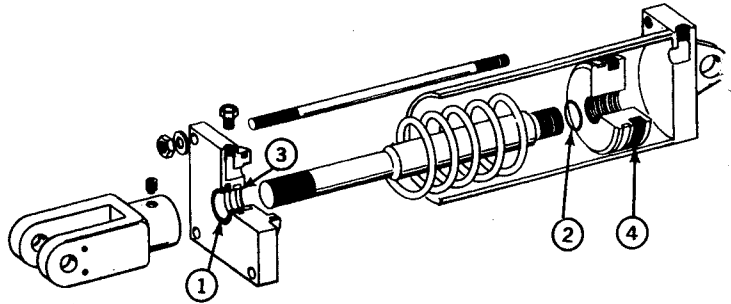
1. Check the bore of the cylinder thoroughly for cracks, rust, scoring or excessive wear.
2. Check all other parts for damage.
3. The rod wiper (1), head o-ring (2), rod seal (3) and wear ring (4), piston o-ring (5), piston seal (6) are supplied as a repair kit, and must be replaced any time the cylinder is disassembled.

#### NOTE

If the cylinder is not to be installed immediately, keep the ports sealed to prevent dirt from entering the cylinder.

#### REASSEMBLY AND INSTALLATION OF CLAMP CYLINDER

1. Reassemble and install the clamp cylinder in the approximate reverse order of disassembly.
2. During reassembly pour one cup of hydraulic fluid into the vented end of the cylinder to help prevent rust.



#### DESCRIPTION OF CARRIER AND PACKER PLATES

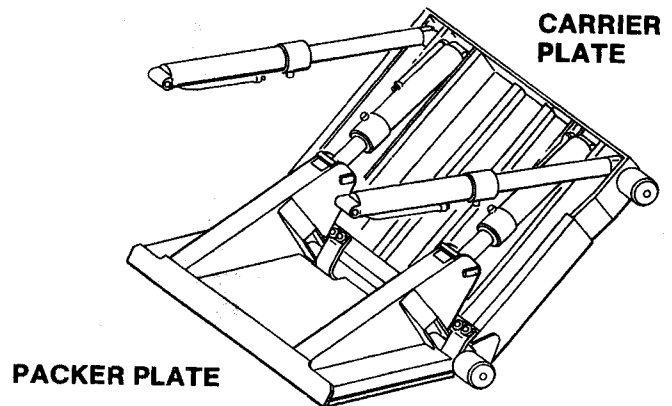
The carrier and packer plates operate as a single unit to sweep the refuse from the hopper and to pack it against the pushout plate. Their movement through the different cycles is controlled by the operating cylinders. The two plates are connected together and pivot on the inside and outside bearing assemblies. Movement of the plates within the body is kept in alignment by the roller assemblies, located at the upper corners of each plate. The rollers ride inside a roller track on each side of the hopper.

This section focusses on some factors that need to be taken into consideration when performing packer/carrier repairs. The packer/carrier assemblies and interrelated components are designed for relatively trouble free use, however, they are subject to reduced service life due to the lack of, or ineffective maintenance. Methods of operation other than for which the unit was designed can also affect the longevity of these components.

#### THEORY OF OPERATION

Many different loads are induced into the structures, bearings, and fasteners of the packer/carrier plates, therefore, all the components of the assembly react and act with every other component. The loads induced by the packer and carrier cylinders must be transmitted through the carrier plate. If, for instance, the center bearing strap bolts become loose then their load carrying capacity is reduced, resulting in overload of the other bearings and their supporting members. Therefore, all the packer/carrier componentry should be taken into consideration if repairs are attempted on a specific area.

If structural repairs are necessary, special attention should be paid to resolving the core of the problem.



As an example, if the unit has received marginal lubrication and the center strap bearings have worn excessively the torque tube may become unsupported. This lack of support may allow the torque tube to bend slightly while appearing to be satisfactory, as a result, if the bearing is replaced without regard to the interrelated damage of the bent torque tube, additional problems are bound to occur. To emphasize; the core problem needs to be resolved to insure a durable and satisfactory repair. Simply repairing the symptom without thoroughly analyzing and addressing the core problem will likely result in a repeat failure. A common trait is to stop short before the problem is completely resolved.

**SERVICE AND REPAIR**

**REMOVAL OF PACKER PLATE**

**Operational Status**

Truck	Off	Keys	Removed
-------	-----	------	---------

1. IF THE CARRIER PLATE IS ALSO TO BE REMOVED; remove all four operating cylinders as described earlier in this section and proceed to step 3 below.

**OR:**

IF THE CARRIER PLATE IS NOT TO BE REMOVED; Attach a chain connected to a suitable lifting device, capable of supporting 1600 lbs. to the lower end of the carrier plate as shown. This will support the carrier plate once the packer plate is removed.

**NOTE**

See Sec. 4, *GENERAL REPAIR PRACTICES* for more detailed information about the correct use of slings and lifting chains.

**Operational Status**

Truck	Running	PTO	Engaged	Sol. Sw.	On
-------	---------	-----	---------	----------	----

2. Move the operating lever out and down to bring the packer plate up. When the plate reaches a vertical position, bring the control lever back to neutral. This will take the pressure off the rod eye when the pin is removed.

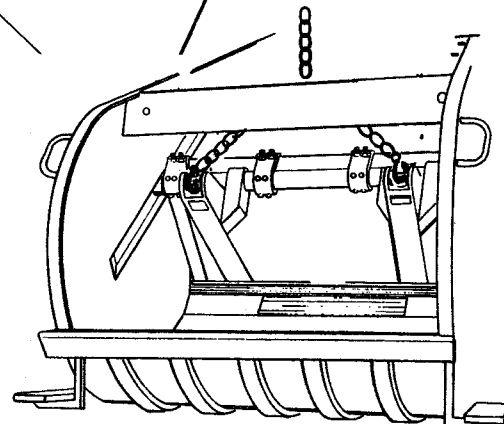
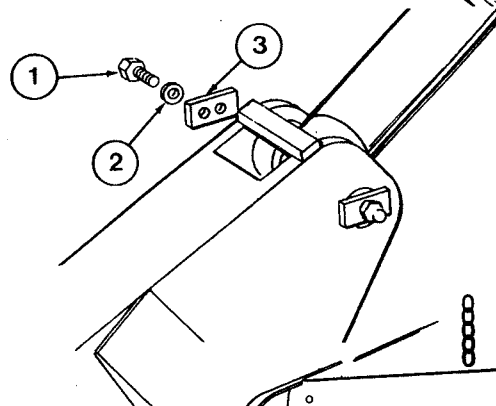
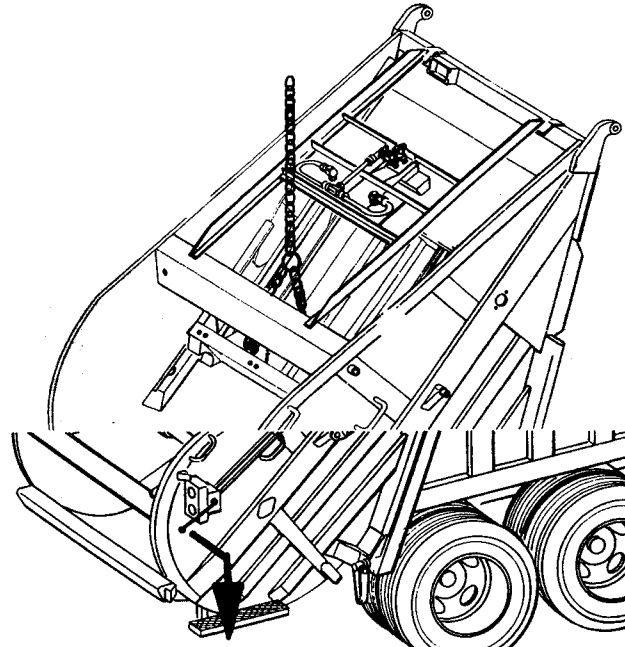
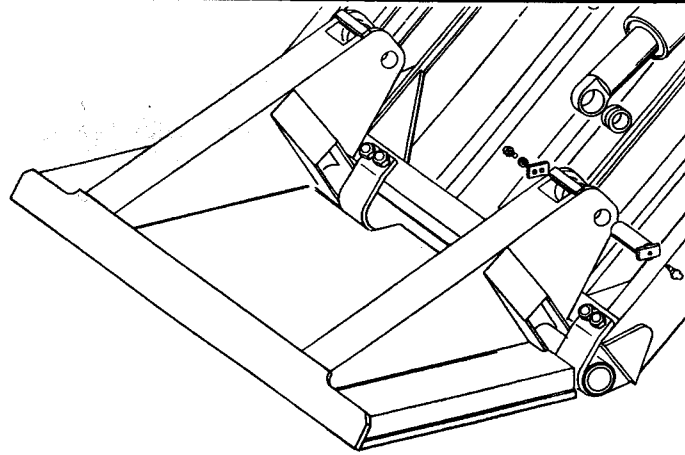
**Operational Status**

Truck	Off	Keys	Removed
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Remove the capscrews (1), lockwashers (2) and pivot pin covers (3) from the rod end.

Make sure the cylinder weight is securely supported by the hoist and carefully remove the pivot pin.

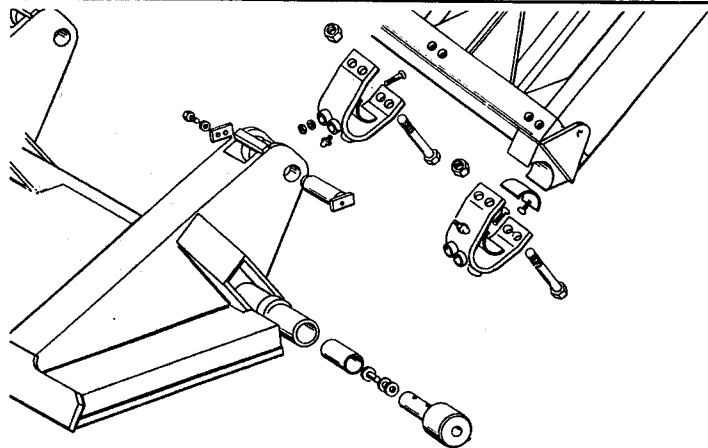
3. Attach a chain connected to a suitable lifting device, capable of lifting 1600 lbs., to the packer plate as shown. Operate the lifting device to support the weight of the packer plate **without** causing strain on the bearing and roller assemblies.



## SECTION 9

### SERVICE AND REPAIR

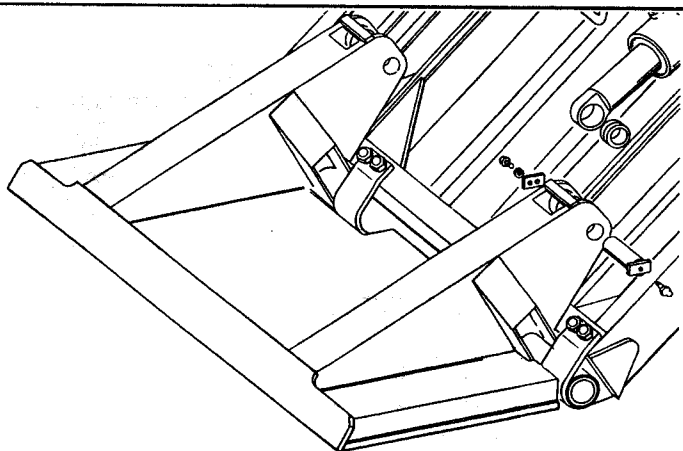
4. Remove the inside bearing assemblies as described earlier in this section.
5. Remove the roller assemblies as described earlier in this section.
6. Remove the outside bearing assemblies as described earlier in this section.



7. With the bearing assemblies removed carefully operate the hoist and lift the packer plate out of the hopper. Use care to avoid damaging the hopper.

### INSPECTION AND REPLACEMENT OF PACKER PLATE

1. Carefully inspect all pivot, bearing and roller surfaces for excessive or uneven wear, scoring, or other damage.
2. Check plate for broken welds, bent edges or warpage.
3. Inspect the packer plate edge for damage. Replace a badly worn edge as described below.
4. Replace parts as necessary. (See Sec. 4, REPAIR INSTRUCTIONS.)

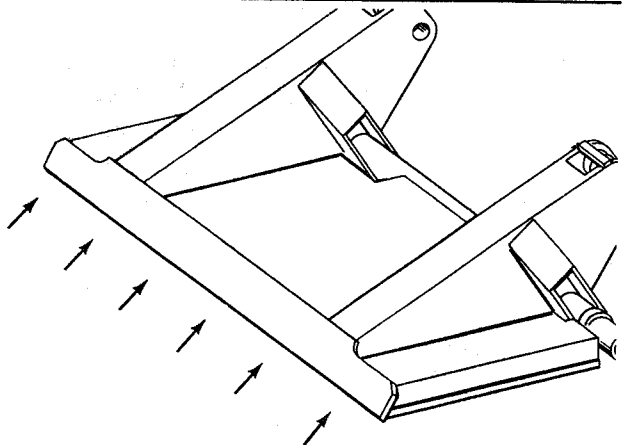


### REPLACEMENT OF PACKER EDGE

1. Remove old edge with an Air Arc to obtain a clean cut.
2. Smooth the packer plate where the new edge will be attached.
3. Weld a new edge in place.

#### NOTE

See Sec. 4, GENERAL REPAIR PRACTICES for more information about welding rods.



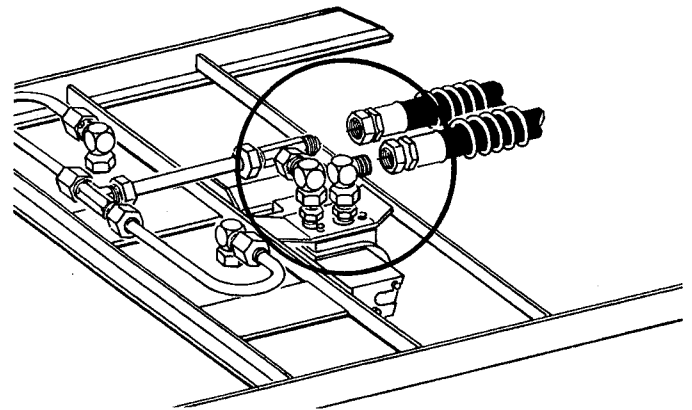
**INSTALLATION OF PACKER PLATE**

Install the packer plate in the approximate reverse order of disassembly. Pay particular attention to the installation of roller and bearing assemblies as described earlier in this section.

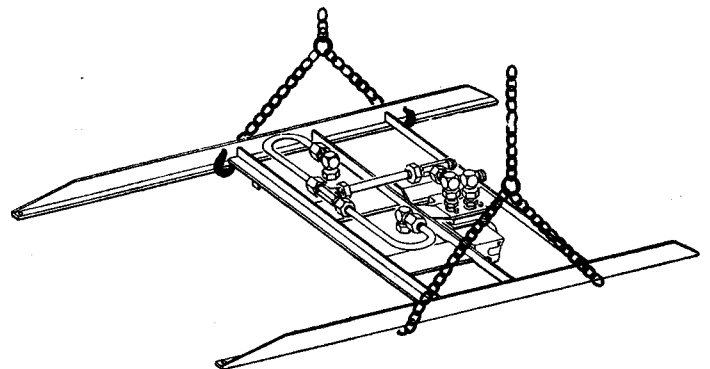
**REMOVAL OF CARRIER PLATE**

Operational Status			
Truck	Off	Keys	Removed

1. Remove top sheet to provide better accessibility.
2. Disconnect and cap the two hydraulic lines to the main operating valve.



3. Attach a sling to the H-frame and remove attaching hardware.
4. Connect sling to a suitable lifting device, capable of lifting 1600 lbs., and remove H-frame from body.

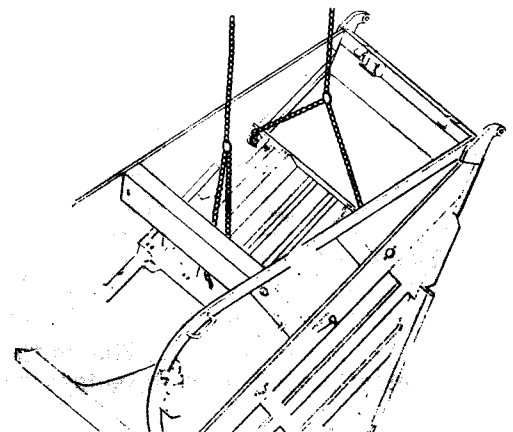


5. Remove packer plate as described above.

**NOTE**

See Sec. 4, *GENERAL REPAIR PRACTICES*, for more detailed information about the correct use of slings and lifting chains.

6. Attach a chain, connected to a suitable lifting device with a minimum lifting capacity of 1600 lbs. to the upper and lower end of the carrier plate, as shown.
7. Remove tailgate as described earlier in this section. Once the tailgate is removed, the carrier plate can be supported or removed as necessary for repair.



## SERVICE AND REPAIR

## CARRIER PLATE

The correct method of operation is thoroughly described in the 2R11 Operators manual. Our policy is not to describe the many different ways in which a unit might be incorrectly operated, however, in an attempt to provide maintenance personnel with clues that may assist in the diagnosing of a reoccurring carrier/packer plate concern that might be operator induced we offer the following:

**Skimming** is a result of the operator interrupting the movement of the packer plate and stopping the packer plate before it rotates perpendicular ( $90^\circ$ ) to the carrier plate. When the packer plate is not allowed to fully rotate and the carrier is then moved toward the "home" position a shear load is induced into the lower channel of the carrier plate. The carrier plate lower channel is designed for compression or tension not shear loads. If the lower channel on the carrier plate cracks or the center bearing straps consistently break, suspect that the unit is being skimmed.

**Short cycling** is when the carrier plate is stopped before it completely lowers. The operator then attempts to penetrate down through the refuse that is in the hopper with the packer plate. This incorrect method of operation results in much the same kind of failures as skimming referred to above because the torque tube and lower carrier channel are put into a shear situation. This incorrect method of operation will also adversely affect the hopper bottom because the force of the packer plate cylinders is being dissipated down through the refuse and into the hopper structure.

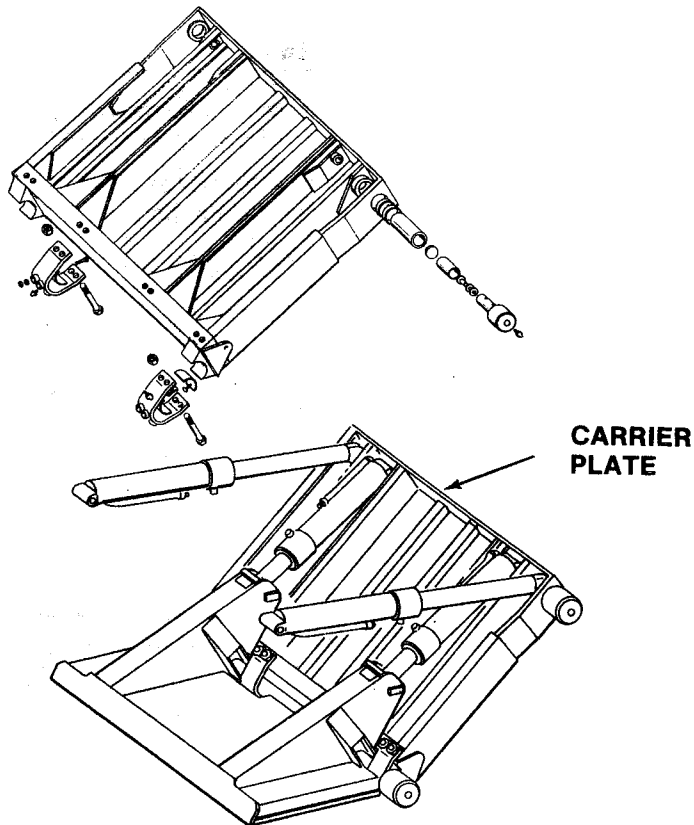
Anytime a repaired area has a repeat failure, suspect that the core problem, whether it is mechanical or operator, has not been adequately addressed.

## INSPECTION AND REPLACEMENT OF CARRIER PLATE

1. Carefully inspect all pivot, bearing and roller surfaces for excessive or uneven wear, scoring or damage.
2. Check the plate for broken welds, bent edges or warpage.
3. Inspect the track bar for excessive wear or damage.
4. Replace parts as necessary.

## INSTALLATION OF CARRIER PLATE

Install the carrier plate in the approximate reverse order of disassembly. Pay particular attention to the installation of roller and bearing assemblies as described earlier in this section.



CARRIER PLATE

## TRACK BAR REPLACEMENT

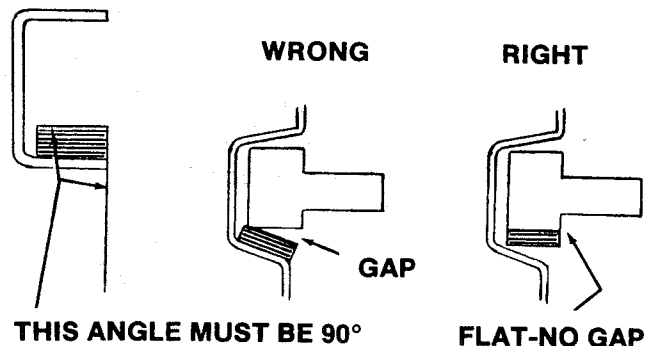
Refer to Sec. 4, GENERAL REPAIR INSTRUCTION for welding instructions.

1. Remove old track bar and make sure track channel is smooth and clean.

**CAUTION**

The Leach track bar is made out of special alloy bar steel. Do not substitute a different steel. It may cause damage to the tailgate.

2. Weld new track bar in place. The surface of the track bar must be at  $90^\circ$  from the side of the tailgate so the roller will run true.

THIS ANGLE MUST BE  $90^\circ$ 

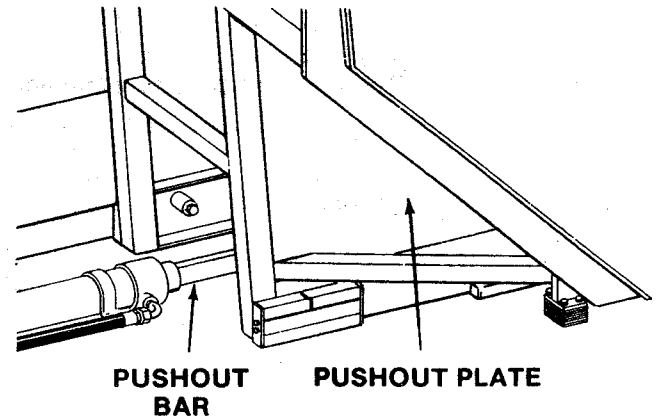
FLAT-NO GAP



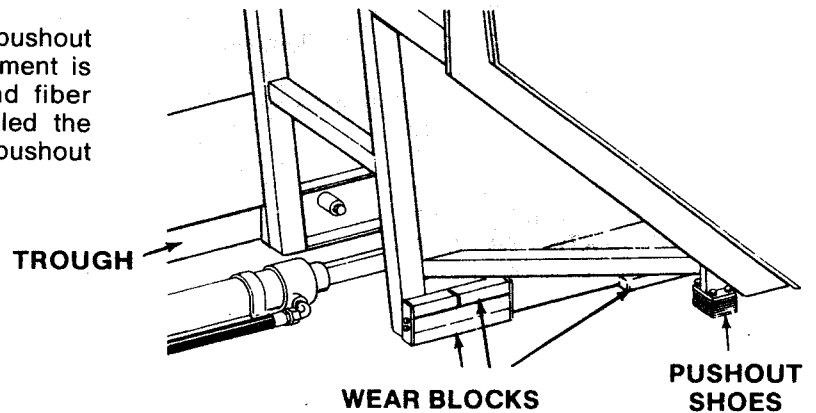
### DESCRIPTION OF PUSHOUT PLATE

The pushout plate is connected to, and controlled by, the pushout bar and pushout cylinder. Refuse is packed against the pushout plate during loading. During unloading, the pushout plate is clamped to the pushout bar and thus pushes out the load as the pushout cylinder is extended.

The pushout plate will not travel the entire length of the body on one stroke of the cylinder so, at the end of the extension stroke the clamp is released and the cylinder retracted. Then the clamp is set again and the plate can be moved rearward one more cylinder stroke. This sequence is repeated as many times as necessary to completely unload the body.



During its movement through the body the pushout plate rides in a trough. Its sideways movement is minimized by eight replaceable plastic and fiber blocks one of which is adjustable and called the friction brake. The front outside edges of the pushout plate ride on pushout shoes.



### FRONT WEAR BLOCK REPLACEMENT

The wear blocks should be replaced before there is metal to metal contact between the pushout plate and trough floor.

Operational Status			
Truck	Off	Keys	Removed

Operational Status					
Truck	Running	PTO	Engaged	Sol. Sw.	On

1. Raise the front of the pushout plate enough to take the weight off the wear blocks, one side at a time. Use a hydraulic jack, wedge, or pry bar. Support the pushout plate and remove the two (2) capscrews on the wear block holder retainer.
2. Slide the upper and lower wear blocks out and replace.
3. Reinstall the wear block holder retainer and tighten the two (2) capscrews.
4. Lower the pushout plate.
5. Repeat items 2, 3, 4, and 5 for the other side.



# SECTION 9

## SERVICE AND REPAIR

### REAR WEAR BLOCK REPLACEMENT

The wear blocks should be replaced before there is metal to metal contact between the pushout plate and trough floor.

#### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
-------	---------	-----	---------	----------	----

1. Push the pushout lever and position the pushout plate as far back as it will go.

#### Operational Status

Truck	Off	Keys	Removed
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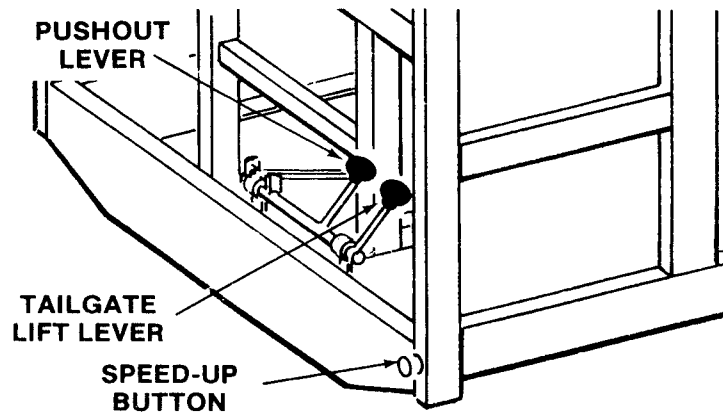
1. Disconnect the pushout bar as described in this section, REMOVAL OF PUSHOUT PLATE, item 4.
2. Slide the pushout plate slightly rearward until the rear wear blocks can be removed following the procedures outlined under REMOVAL OF PUSHOUT PLATE, later in this section.
3. Replace rear wear blocks.
4. Carefully slide the pushout plate forward.
5. Reconnect the pushout bar to the pushout plate.

### REMOVAL OF PUSHOUT PLATE

#### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
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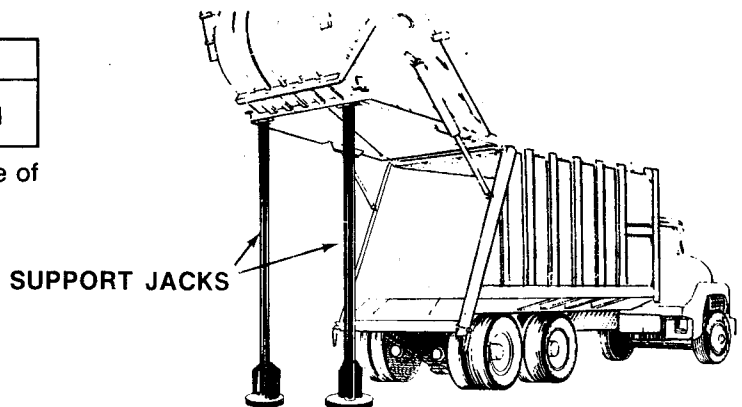
1. Push the pushout lever and position the pushout plate at the extreme rear of the body.
2. Pull the tailgate lift lever to raise the tailgate after swinging away the tailgate clamps.



#### Operational Status

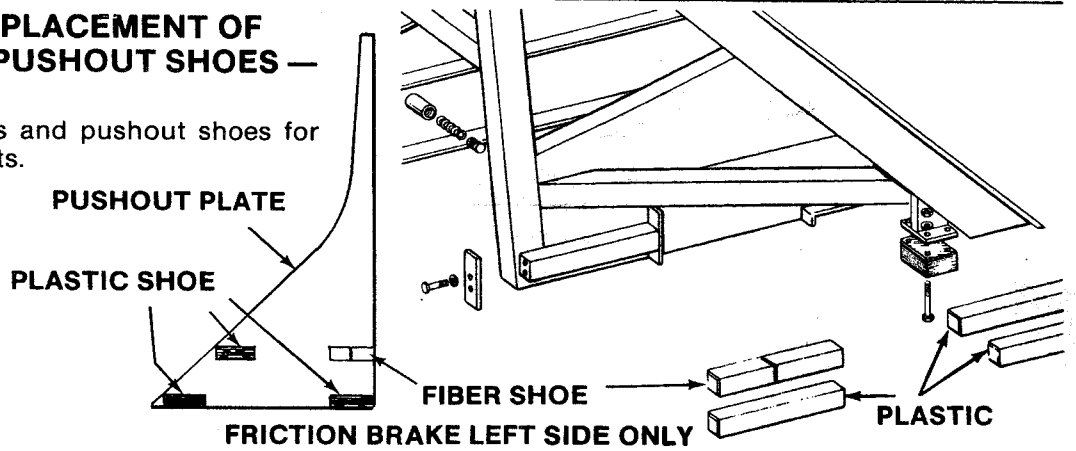
Truck	Off	Keys	Removed
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3. Support the tailgate with support jacks capable of supporting at least 7500 lbs.



**INSPECTION AND REPLACEMENT OF WEAR BLOCKS AND PUSHOUT SHOES — PLATE REMOVED**

1. Inspect the wear blocks and pushout shoes for wear. Replace worn parts.



**INSTALLATION OF PUSHOUT PLATE**

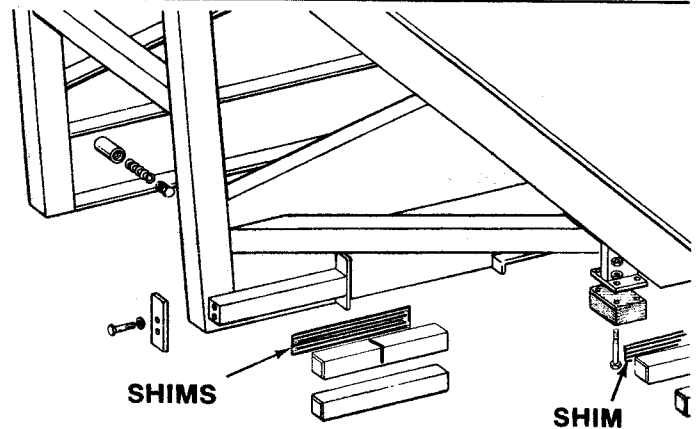
Install the pushout plate in the reverse order of removal.

**SHIMMING UPPER WEAR BLOCKS WITH PLATE IN PLACE**

Shim can be added to the upper wear blocks in the front without removing the pushout plate, as follows:

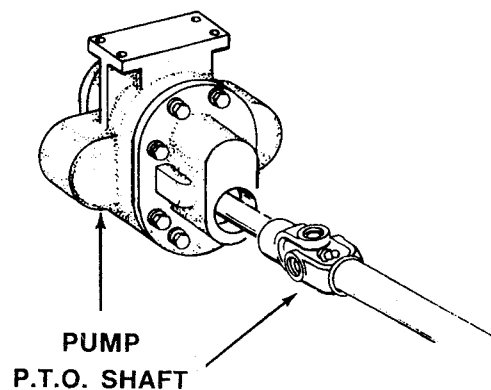
Operational Status			
Truck	Off	Keys	Removed

1. Loosen friction brake adjusting bolt.
2. Pry plate at forward (nearest cab) end to one side.
3. Add shims behind wear block.
4. Repeat procedure for the other side.
5. Tighten friction brake adjusting bolt until plate does not move when stopping or starting.



**DESCRIPTION OF LEACH HYDRAULIC PUMP**

The pump which serves the complete hydraulic system is a gear type, coupled to the PTO shaft through a yoke arrangement. It is usually mounted under the 2R11 body near the front end, curb side. The LEACH pump can run in either direction — clockwise or counterclockwise rotation. The locations of the suction and pressure hoses are determined by this direction of rotation; it is therefore imperative to install hoses correctly.



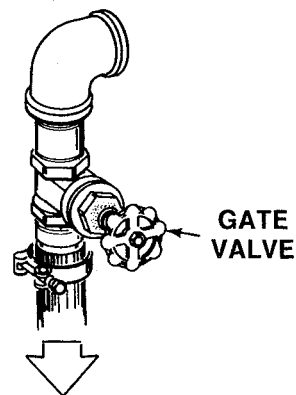
## SERVICE AND REPAIR

### REMOVAL OF HYDRAULIC PUMP

#### Operational Status

Truck	Off	Keys	Removed
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1. Shut gate valve at underside of hydraulic oil tank.

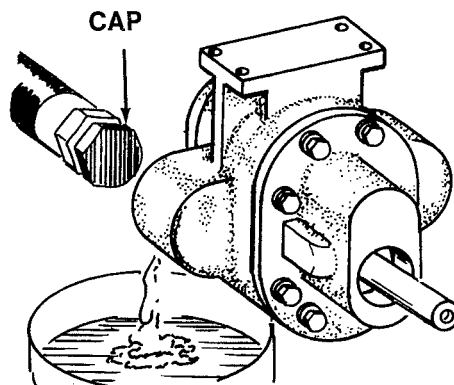


2. Remove hose clamp.
3. Remove pump suction line and allow fluid to drain.

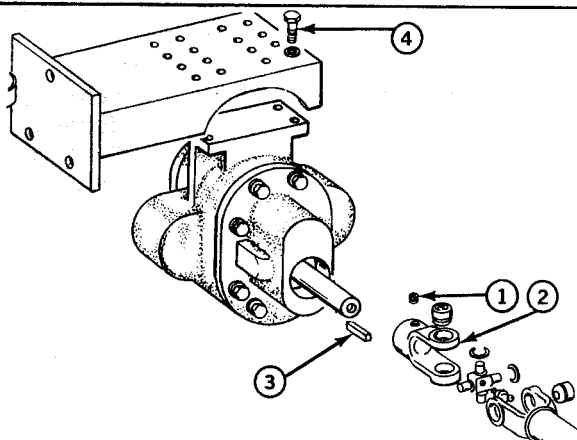
#### NOTE

*Pump suction line (tube and hose) will also be filled with hydraulic fluid. Pump and line may be drained into an absolutely clean container and the fluid poured back into tank.*

4. Disconnect high pressure hose at the pump and cap the end.



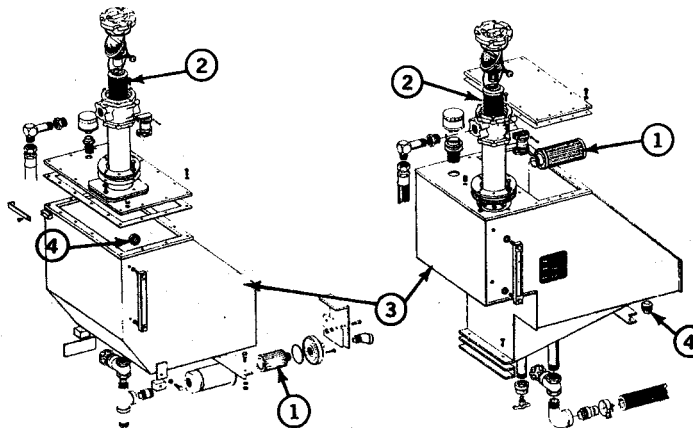
5. Loosen setscrew (1) and free yoke (2) from pump shaft by telescoping PTO drive shaft toward PTO.
6. Remove key (3) from pump shaft keyway.
7. Remove hardware (4) and pump assembly from mounting bracket.



### NEW PUMP PREPARATION

Before installing a new pump, refer to Sec. 6, PREVENTIVE MAINTENANCE and the following. This will prevent contamination of the new pump.

1. Remove and clean the hydraulic tank strainer. (1)
2. Change the filter element. (2)
3. Drain and flush the hydraulic tank as described in Sec. 6, PREVENTIVE MAINTENANCE. (3)
4. Clean the magnetic plug. (4)



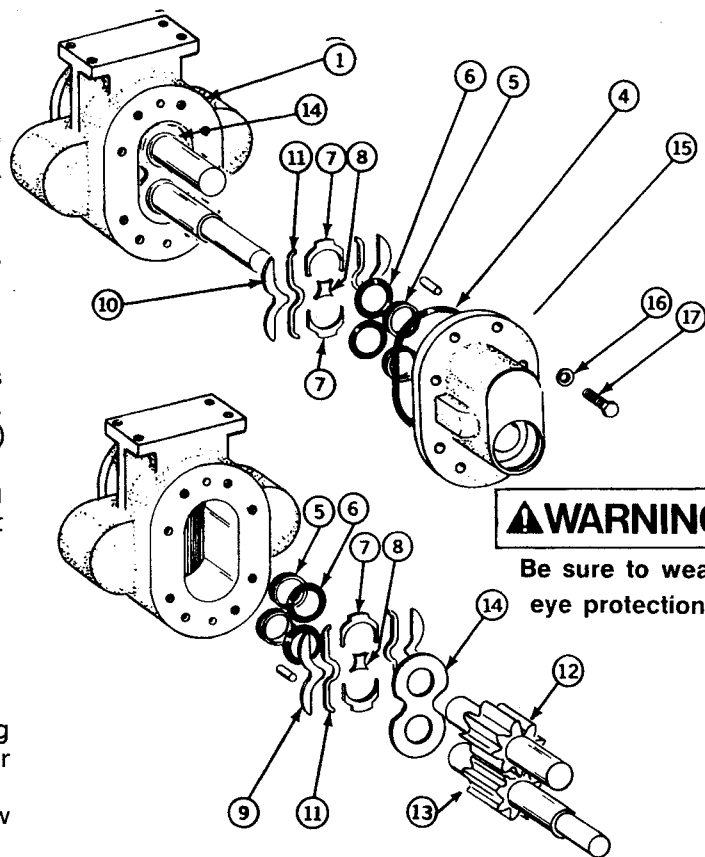
## DISASSEMBLY OF 203834 HYDRAULIC PUMP

1. After removal, thoroughly clean the outside with solvent and a brush. Then blow dry the pump with compressed air. Scribe flange cover (15) and body (1) so they can be matched for reassembly.
2. Carefully place the pump body in a vise and remove capscrews (17) and washers (16).
3. Lift flange cover (15) off pump body and remove the O-ring (4) from the flange.
4. Remove O-ring (6) and back-up ring (5) from each gear shaft.
5. Remove top isolation plates (10), sealing strips (11), end separators (7) and center separator (8).
6. Remove top pressure plate (14), drive gear (12) and idler gear (13).
7. Remove the bottom pressure plate (14) by using an expandable bearing puller and lifting straight up out of the body.

### NOTE

*It may be necessary to use a sharp knife to remove the rolled up lapped edge that adjoins the pressure plate. Do not force or bend the pressure plate.*

8. Remove the bottom isolation plates (9), sealing strips (11), end separators (7), center separator (8), back-up rings (5) and O-rings (6).
9. Clean all the internal parts with solvent and blow dry.
10. Inspect all parts carefully.

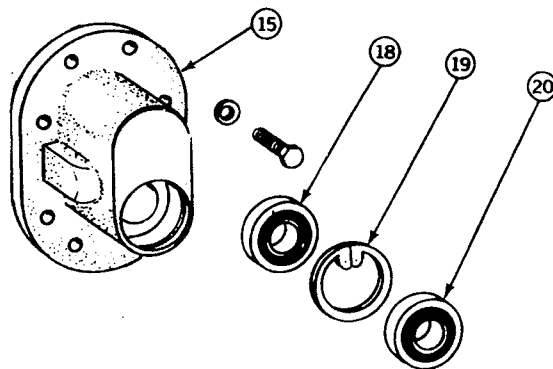


### WARNING

Be sure to wear eye protection.

## REPLACING HYDRAULIC PUMP SHAFT SEALS ON 203834 HYDRAULIC PUMP

1. Remove the flange cover (15) from pump as described in steps 1-4 of the Disassembly Instructions.
2. First drive out the old wiper (20).
3. Remove snap ring (19) and then the seal (18).
4. Clean the flange cover (15) in solvent and blow dry.
5. Press in a new seal (18).
6. Install snap ring (19) and a new wiper (20).
7. Install the flange cover (15) as described in steps 12-16 of the Reassembly Instructions.

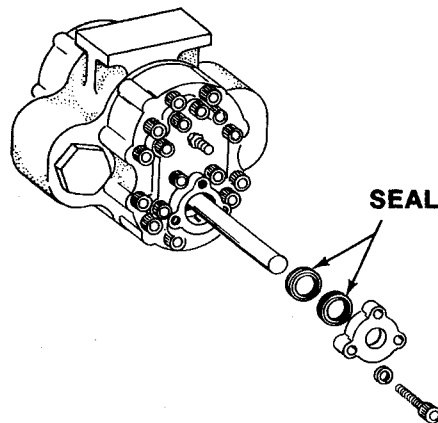


## REPLACING HYDRAULIC PUMP SHAFT SEALS ON SR-9541

In the event that a pump shaft seal is leaking a second seal can be added.

1. First, make sure that it is the seal that is leaking.
2. Inspect the pump shaft for any burrs or small nicks that could damage the seal during installation.
3. Make sure that both seals are installed correctly with the spring loaded lip facing in.
4. Simply install a second seal over the first and drive both seals back, flush against the case. Use care not to damage either the seals or the pump shaft.

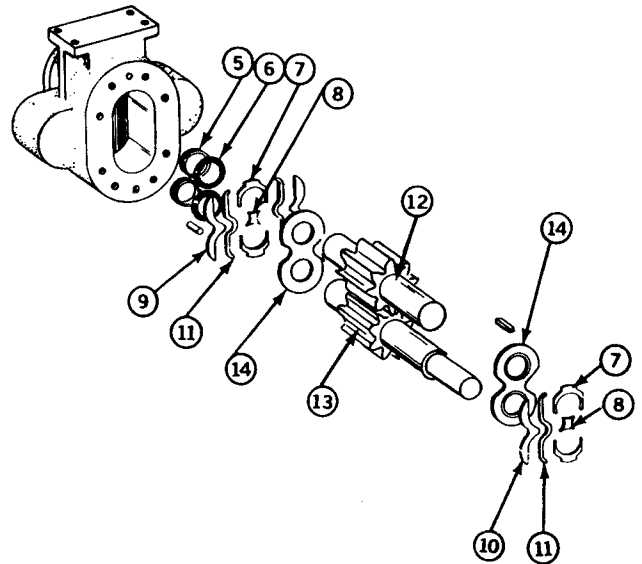
LEACH does not recommend field repair of the SR-9541 hydraulic pump, except for replacement of the pump shaft seal.



## SERVICE AND REPAIR

REASSEMBLY OF 203834  
HYDRAULIC PUMP

1. Place the body (1) so the scribed mark faces you.
2. For easier assembly, use clean hydraulic fluid as a lubricant.
3. Install O-rings (6) and back-up rings (5) on the protruding ends of the bearings at the bottom of the body.
4. Examine the four isolation plates. Note that one pair is slightly different from the other pair. Choose the two that have the rounded outer edges (9) and install them in their proper location at the bottom of the body bore with the rounded edges facing down.
5. Install end separators (7), center separator (8), and sealing strips (11).
6. With the bronze side facing up, lower the bottom pressure plate (14) into place in the bottom of the body bore. Do not force.
7. Install drive gear (12) by lowering carefully.
8. Install idler gear (13).
9. Install the tcp pressure plate (14) with the bronze side facing down.
10. Install end separators (7), center separator (8), sealing strips (11), and isolation plates (10).
11. Examine the drive cover shaft seal (18) and wiper (20). If replacement is necessary see "Seal Replacement Instructions"

**NOTE**

The check valves (3) located in the flange cover (15) are not replaceable. They are only available as part of flange cover (15).

12. Install O-rings (6) and back-up rings (5) on the extended portion of the bearings inside the flange (15) plate.
13. Install O-ring (4) into the groove in the flange cover (15). Use heavy grease to hold the O-ring in place.

**NOTE**

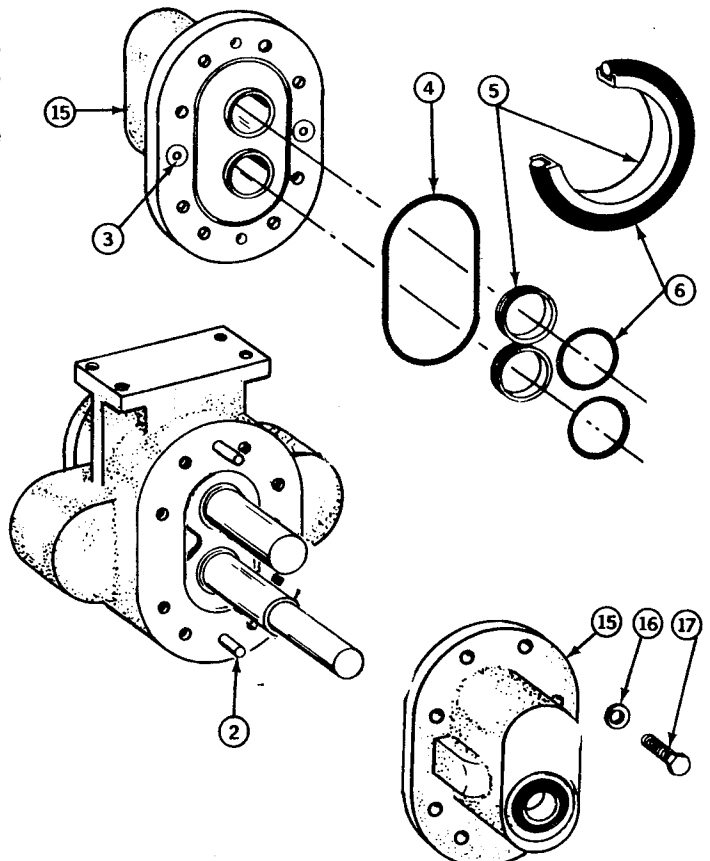
Coat the drive gear shaft extension with clean, heavy grease to protect the seal lip as the seal slides over the shaft.

14. Slide the flange cover (15) down on the drive gear (12) until it touches the dowels (2) in the body.

**NOTE**

Use extreme care when seating the flange cover against the body. If not pressed down carefully, the extended portion of the flange cover bearings can pinch the sealing strips.

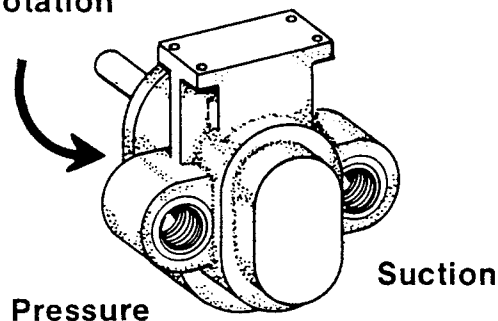
15. Insert washers (16) and capscrews (17) into the holes in the flange cover (15). Tighten opposite and even to 80 foot pounds of torque.
16. Test the pump by using an adjustable wrench with a key installed in the drive gear. When attempting to turn the shaft it should feel tight with a maximum of 5 to 10 foot pounds of torque. If the shaft does not turn properly disassemble, find the problem, and carefully reassemble.



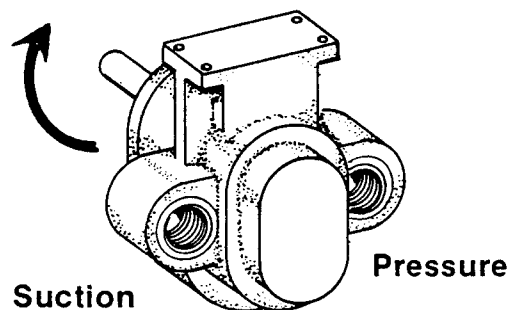
## INSTALLATION OF HYDRAULIC PUMP

1. Install pump in reverse order of removal. **MAKE SURE** suction and pressure lines are installed correctly for pump rotation. Tighten all mounting hardware and hose clamps.
2. Be sure to re-install any shaft guards that may have been removed.

Rotation



Rotation



## TESTING A NEW PUMP

After installing a new pump, check for correct cycle time and main line pressure as described in Sec. 7, CHECK-OUT.

## DESCRIPTION OF ELECTRICAL SYSTEM

The Packer electrical system includes all of the body running and marker lights, operational speed up switches, the operator ready and back-up warning buzzers, and all interconnected wiring, as shown on the accompanying wire diagram.

## TESTING

To locate a defective component or break in the wiring perform a continuity check across and between suspected components as described in Sec. 4, GENERAL REPAIR.

## GROUNDING THE ELECTRICAL SYSTEM

To insure a proper ground for the electrical system, make sure internal lockwasher is installed in the following areas:

1. Buzzer System — between pushbutton and bracket.
2. Speed Up System — between pushbutton and bracket.
3. Back Up Alarm — between backup alarm and bracket.
4. Tailight — between light and bracket.

This internal lockwasher will bite into the metal and insure a positive ground.

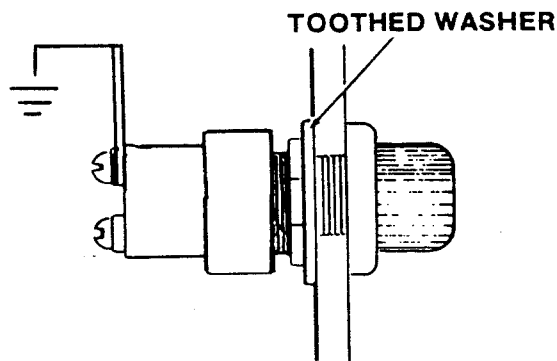
## REPAIR

Repair of the electrical system is limited to the replacement of burned out light bulbs and other defective parts or wiring.

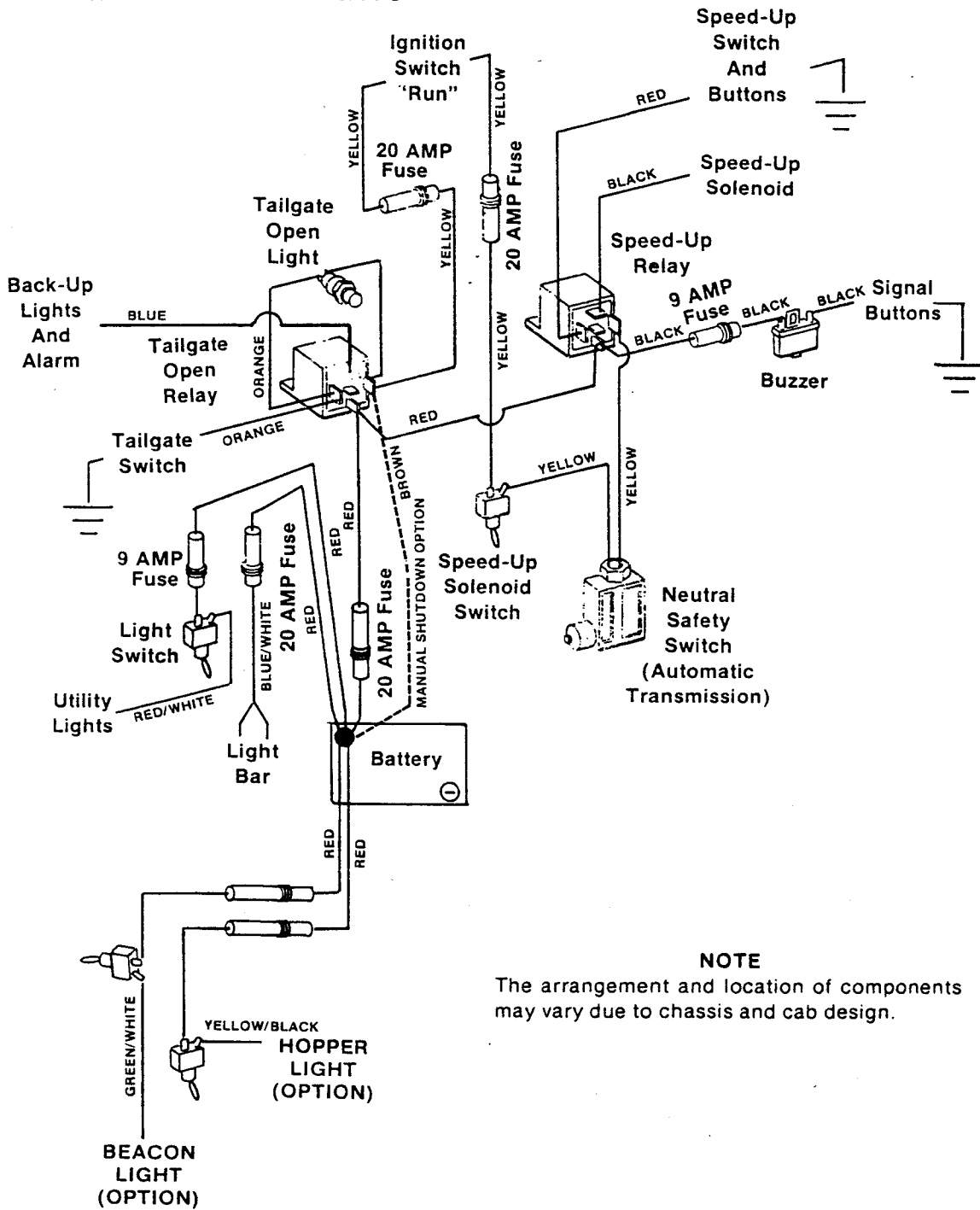
## INSPECTION

1. Operate all light switches and pushbutton controls to insure that they are operating normally.
2. Check all wiring for breaks, frayed or worn insulation and loose terminal connections.

## TYPICAL EXAMPLE



# IN CAB COMPONENTS

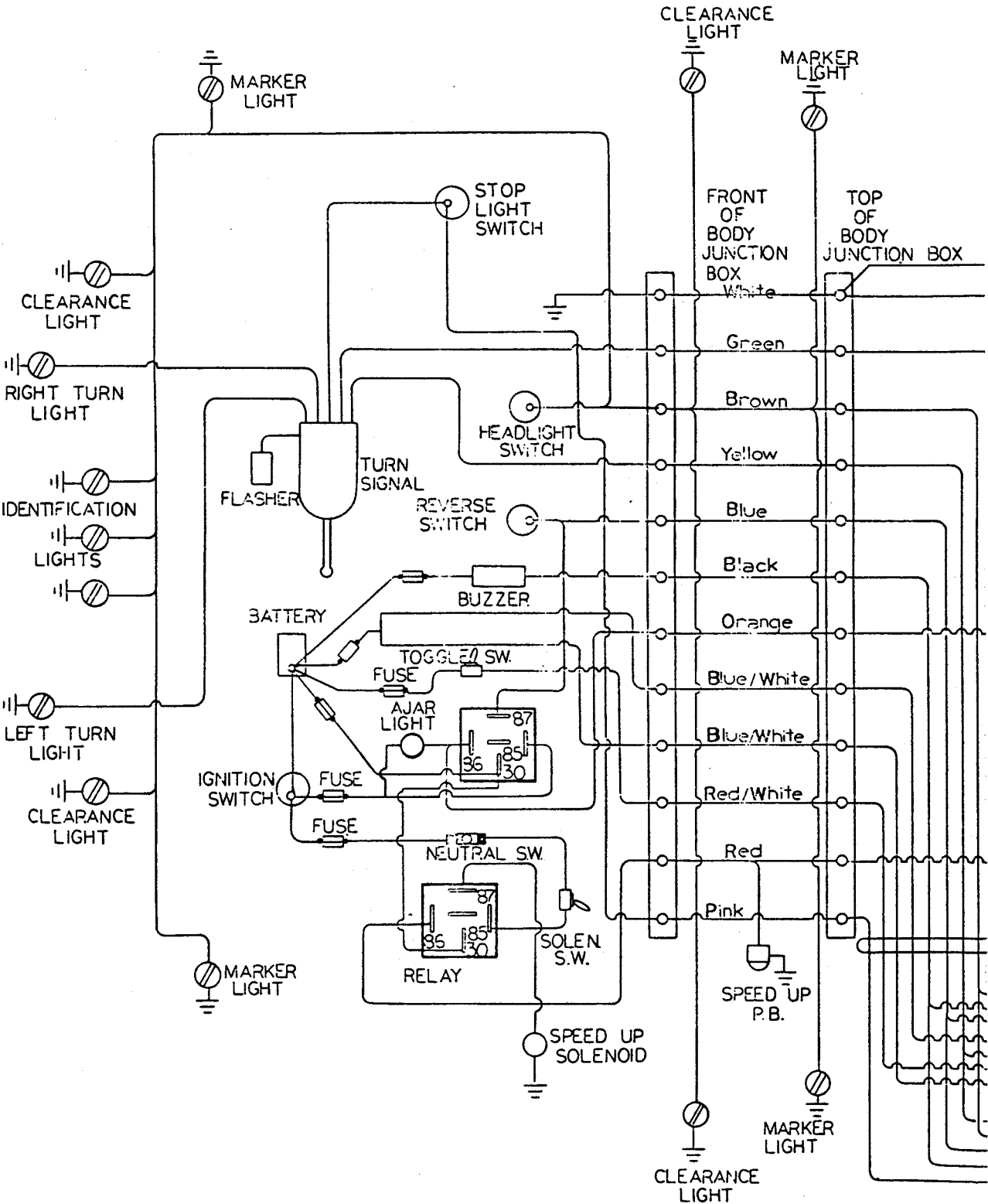


## NOTE

The arrangement and location of components may vary due to chassis and cab design.

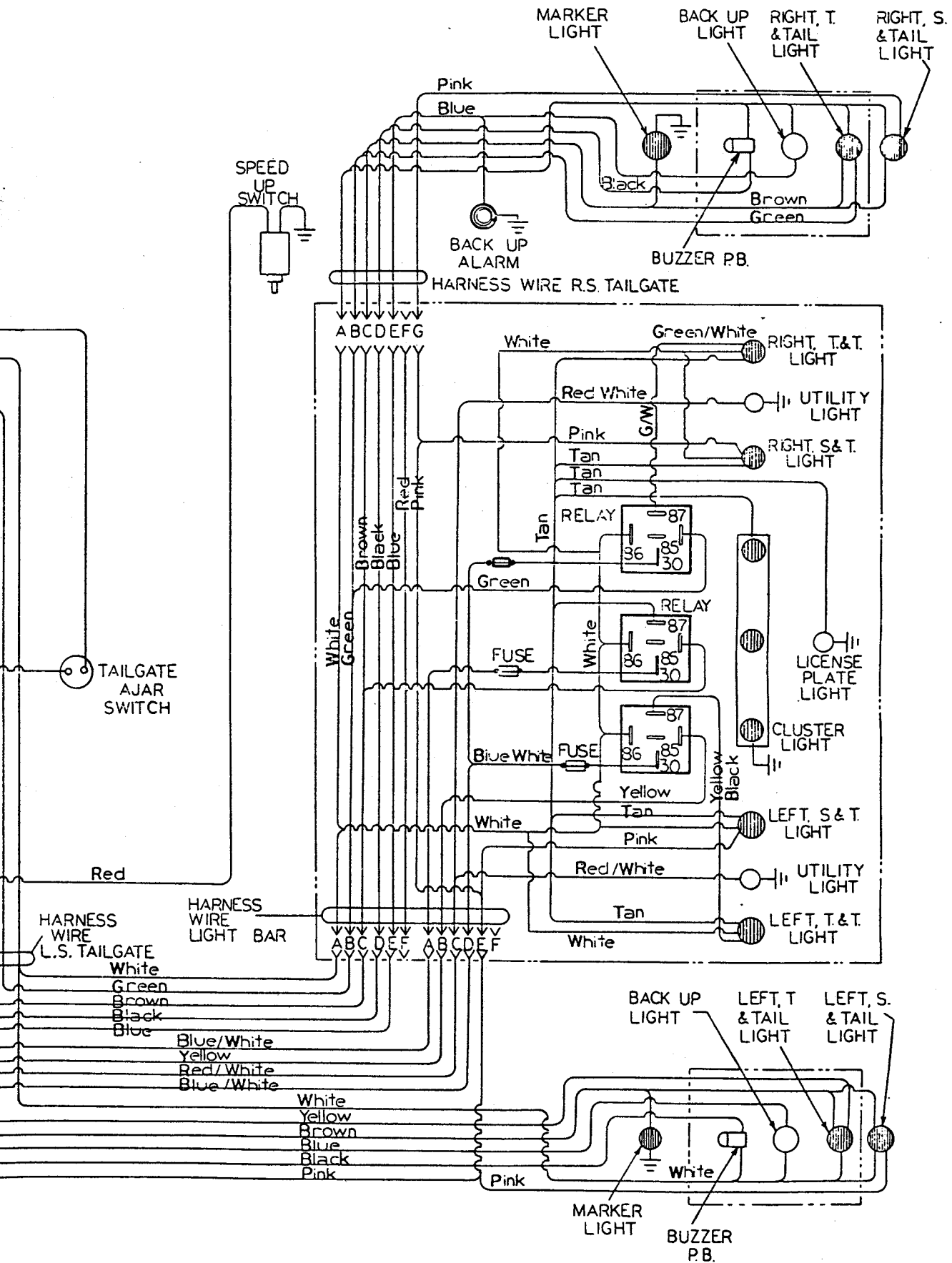


## ELECTRICAL SCHEMATIC — CLAMP



# SECTION 9

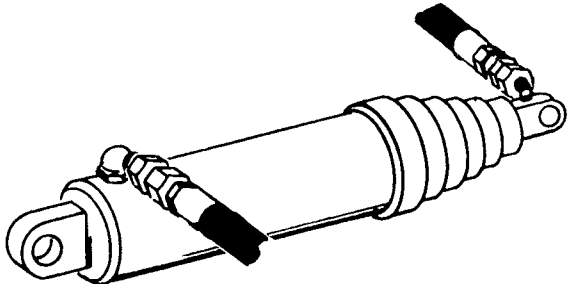
## SERVICE AND REPAIR



**OPTIONAL TELESCOPIC PUSHOUT**

**GENERAL**

The telescopic pushout cylinder option enables the pushout plate to be moved the entire length of the body with one stroke of the cylinder. This option replaces the clamping mechanism, pushout bar, sequence pilot check (SPC) valve, and pushout cylinder.



**OPERATION**

The multi-stage cylinder (telescopic) is operated as explained in Section 3, OPERATIONS. The operator can extend or retract the cylinder and thus position the pushout plate at the front or rear of the body. To limit the amount of force when moving the pushout plate to the rear, with the tailgate closed, (BACK PACKING), a force limiting (ANTI-BACK PACKING) system circuit is incorporated in the hydraulic system.

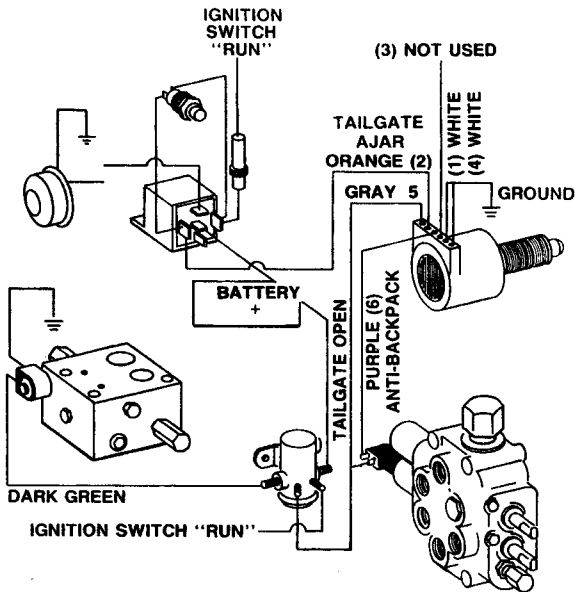


**ANTI-BACK PACKING COMPONENTS**

The telescopic pushout functions with both electrical and hydraulic components. The electrical circuit limits the hydraulic operation and provides a safety warning to the operator.

The telescopic electrical system functions with two relays located in the chassis cab and three components in the packer body. The key component is the tailgate open (ajar) switch. This two position switch must be kept in adjustment to ensure that when the tailgate is closed, continuity is maintained through the anti-back packing switch, triggering the telescopic relay and energizing the telescopic solenoid. An indication of a properly adjusted and functioning tailgate open switch is the dash mounted tailgate open warning light, which will only illuminate when the tailgate is raised.

When the tailgate begins to open, the tailgate open warning light will illuminate and the back-up lights and alarm will be activated. At the same time, the telescopic relay remains energized by continuity from the tailgate switch. A thorough understanding of the electrical system is necessary prior to troubleshooting the telescopic pushout hydraulics using the flow charts and checkout procedures.



**NOTE**  
See Electrical Schematic for Complete Electrical System

## OPTIONAL TELESCOPIC PUSHOUT

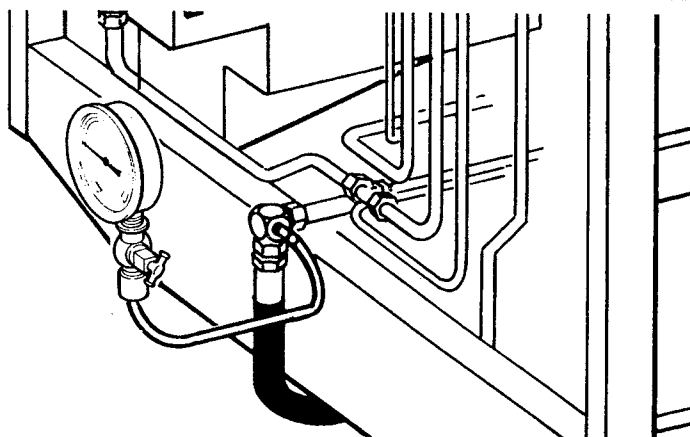
### CHECKOUT PROCEDURES

Checkout of the telescopic equipped unit is the same as the standard clamp system (See Section 7) except for pressure checking the pushout cylinder.

#### Operational Status

Truck	Off	Keys	Removed
-------	-----	------	---------

1. Install gauge at test port as shown.



### CHECK PUSHOUT PRESSURE (TAILGATE CLOSED)

This check is to verify proper adjustment and functioning of the tailgate open switch, anti-back pack switch, telescopic relay, solenoid and force limiting hydraulic circuits.

2. Depress speed-up button.
3. Move the pushout control lever to fully extend the telescopic cylinder.
4. Hold lever and read gauge: Pressure should be 700 psi
5. If above 700 psi — check that the tailgate ajar light is off, indicating that continuity from the tailgate open switch is passing through the anti-back pack switch.
6. If no current is energizing the solenoid and the pressure registers above 700 or below 500 psi -the force limiting cartridge must be adjusted or replaced.

#### Operational Status

Truck	Running	PTO	Engaged	Sol. Sw.	On
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PUSHOUT LEVER  
TAILGATE LIFT LEVER

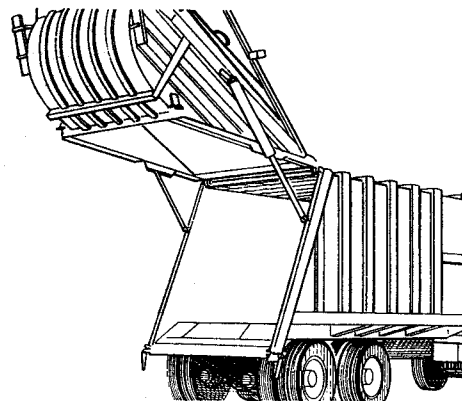
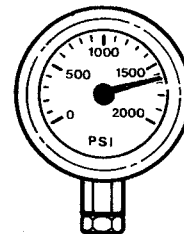
SPEED-UP BUTTON

**▲WARNING**

The tailgate warning system must work properly to prevent possible personal injury or damage to the unit.

### CHECK PUSHOUT PRESSURE (TAILGATE RAISED)

1. Release tailgate clamps.
2. Depress and hold speed-up button.
3. Pull the tailgate lift lever to raise tailgate. Dash mounted warning light "TAILGATE OPEN" should illuminate and backup lights and alarm should activate.
4. Note the pressure reading on the gauge as the tailgate is fully raised. The pressure should be 1650 psi. If not - see SECTION 7, CHECKOUT for main relief adjustment or pump performance.
5. Push speed-up button and move pushout control lever to fully extend the telescopic cylinder.
6. Again hold pushout control lever and read gauge: Pressure should be 1650 —  
— If still 700 psi, check wiring from tailgate switch to relay and relay to solenoid. Solenoid must be energized to allow full pressure (1650 psi) to move pushout cylinder.  
— If between 700 and 1650 psi, the force limiting components are functioning properly but the telescopic cylinder may have leaking seals causing a pressure drop.



## OPTIONAL TELESCOPIC PUSHOUT

## CHECK TELESCOPIC CYLINDER RETRACTION (MANUAL)

1. Move the pushout control lever to fully retract the pushout cylinder.

**NOTE**

*DO NOT HOLD SPEED-UP BUTTON.*

2. As the cylinder retracts and pulls the pushout plate toward the front of the body, the pressure gauge should indicate 1650 psi.
  - If the pressure is less than 1650 and the cylinder does not retract, the cylinder is bypassing and must be repaired.

**NOTE**

*Contact your local genuine LEACH distributor before disassembling any telescopic cylinder.*

— If cylinder retracts in a continuous movement with a pressure below 1650 psi, continue to use the cylinder but monitor overall unit performance for other indications of wear.

## CHECK TELESCOPIC RESISTANCE CIRCUIT

Operational Status			
Truck	Off	Keys	Removed

1. Install snubber gauge at test port in 1/4" line tee as shown.

**NOTE**

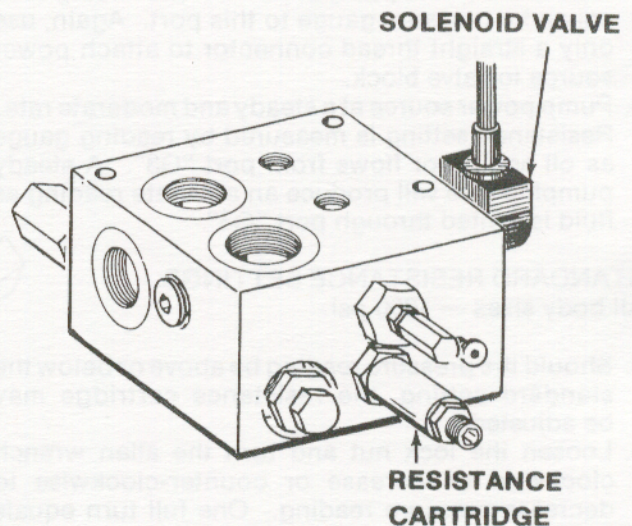
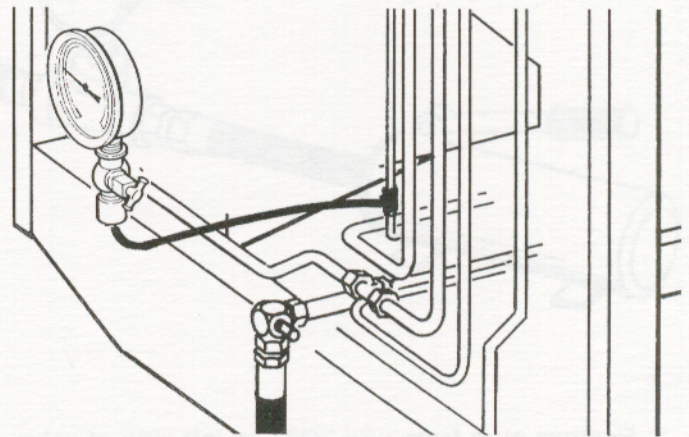
*The electrical system which energizes the telescopic solenoid must be functioning or compaction rates will be below normal due to the bleeding off of internal telescopic cylinder pressure which is required to maintain resistance force against the load. The electric solenoid valve must be continuously energized or the resistance circuit will not work properly.*

Operational Status				
Truck	Running	PTO	Engaged	Sol. Sw. On

2. Cycle unit while loading refuse.
3. As refuse is compacted in the body, the pressure gauge should indicate increased pressure. When sufficient refuse is loaded to require movement of the pushout plate, the cylinder will retract as pressure increases to 1000 psi. Retraction continues until knockout. Gauge should indicate 1400 psi at knockout.

The resistance cartridge may be adjusted to tailor loads to operating requirements. See adjustment procedures listed under empty body checks.

Following knockout, pushout plate movement will stop, thus maintaining compaction force on the load. This same process is repeated each time sufficient refuse is loaded to force the pushout plate forward.



**OPTIONAL TELESCOPIC PUSHOUT**

**CHECK TELESCOPIC RESISTANCE CIRCUIT WHEN BODY IS EMPTY**

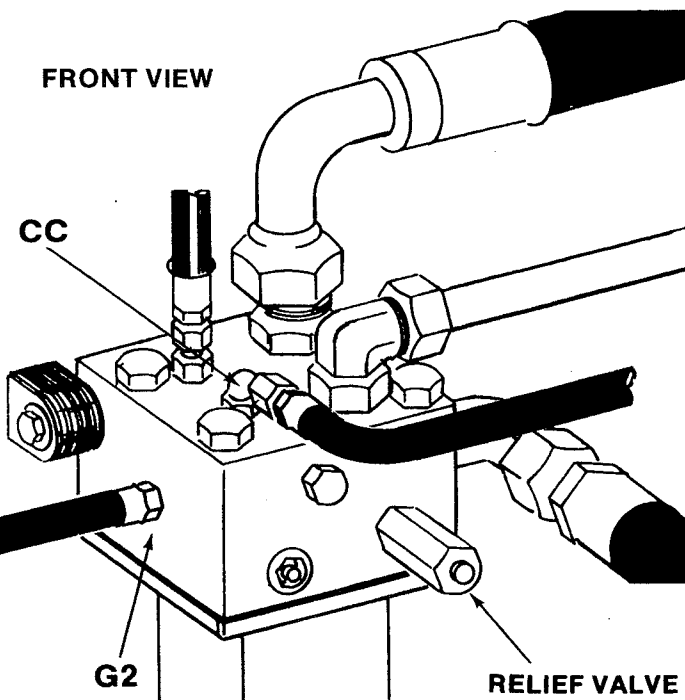
**CAUTION**

Engine must be off while performing checks.

1. Remove plug from port "G3" on side of valve block.
2. Disconnect hose, remove fitting from port "CC" on top front corner of valve block and install plug removed from "G3".

**NOTE**

Most of the connections are straight thread o-ring. Do not use pipe thread.



**NOTE**

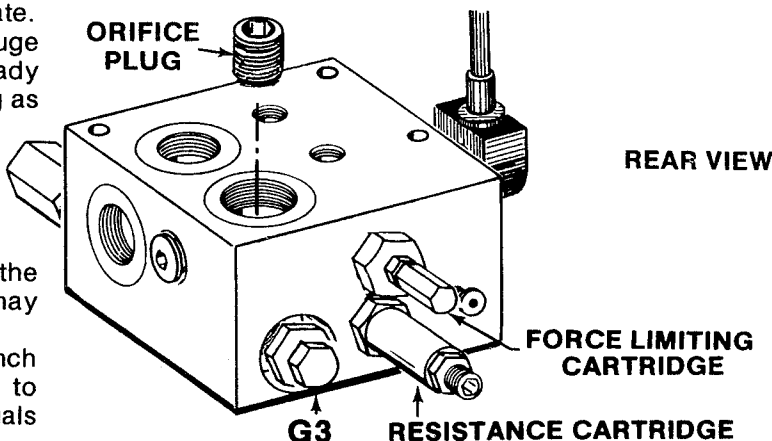
Remove tank hose and fitting from block. Check that an orifice plug has been installed. The orifice size controls the distance the pushout plate moves once the resistance cartridge has been opened.

3. Remove plug from port "G2" on left side of valve block. Connect a pump capable of producing 1500 psi and a pressure gauge to this port. Again, use only a straight thread connector to attach power source to valve block.
4. Pump power source at a steady and moderate rate. Resistance setting is measured by reading gauge as oil squirts or flows from port "G3". A steady pumping rate will produce an accurate reading as fluid is vented through port "G3".

**STANDARD RESISTANCE SETTINGS:**

All body sizes — 1000 psi.

5. Should the pressure reading be above or below the standard setting, the resistance cartridge may be adjusted.
6. Loosen the lock nut and turn the allen wrench clockwise to increase or counter-clockwise to decrease pressure reading. One full turn equals approximately 500 psi.
7. After adjusting valve, retighten lock nut and recheck pressure to verify setting.



**CAUTION**

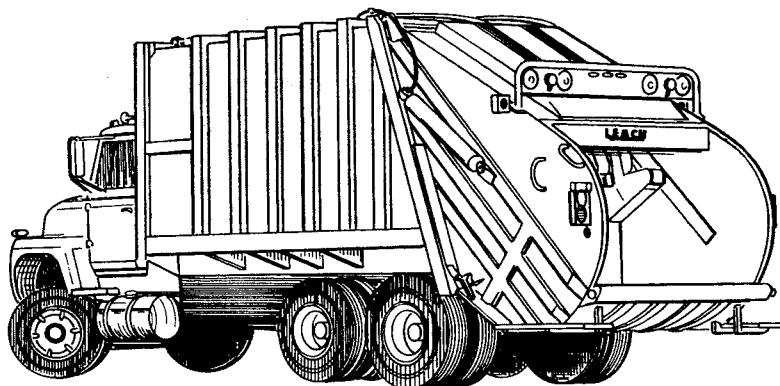
Do not adjust force limiting cartridge. This component does not control the automatic retraction sequence and improper adjustment could damage the unit.

OPTIONAL TELESCOPIC PUSHOUT

TROUBLESHOOTING

HYDRAULIC OPERATION

The Telescopic Hydraulic system works the same as the standard system (see flow charts in Section 8) except as described below.



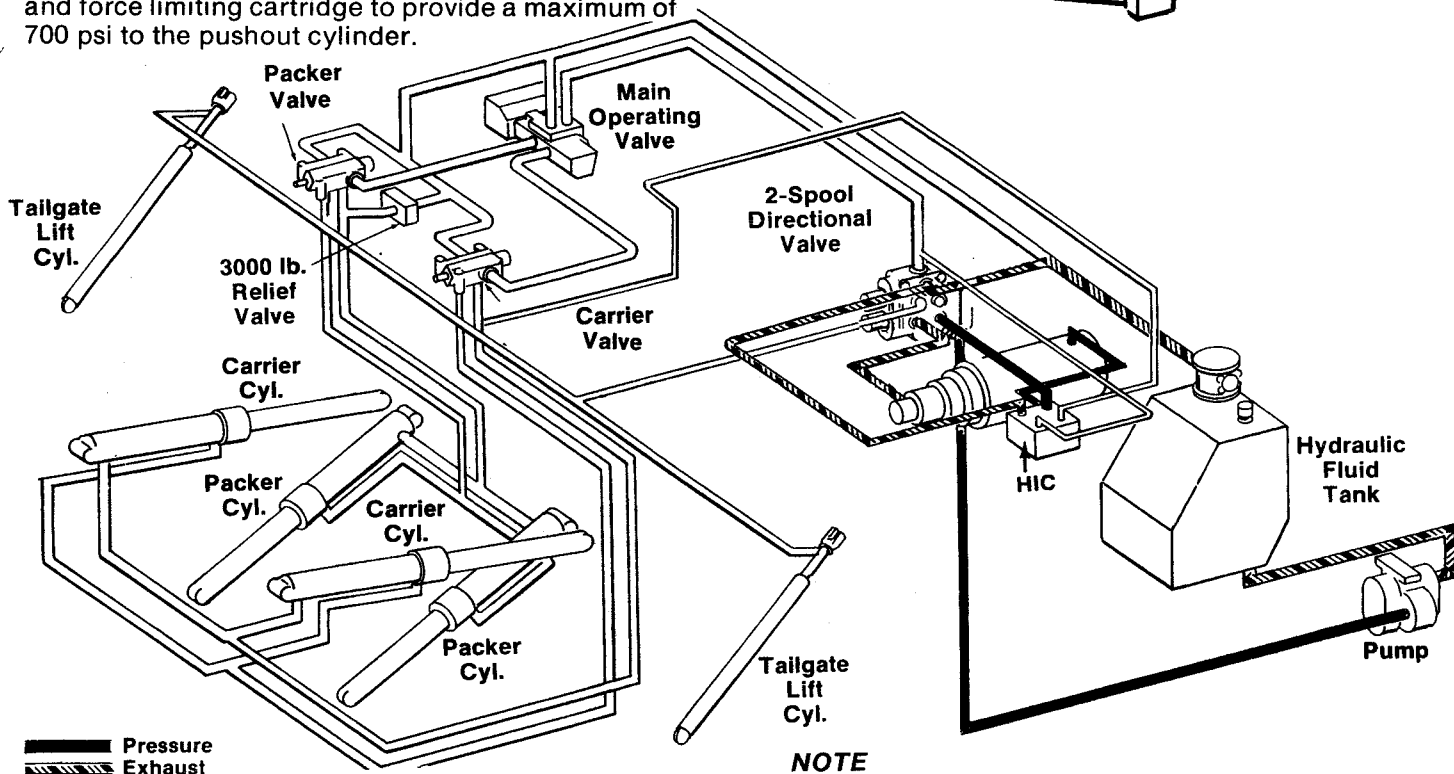
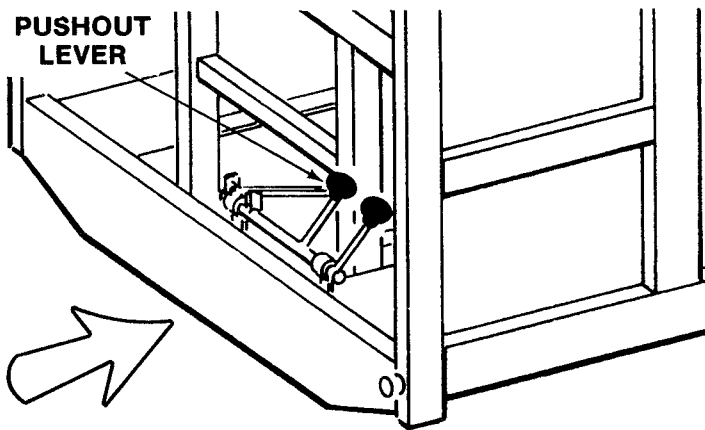
MOVING PUSHOUT PLATE TO REAR FOR LOADING (ANTI-BACK PACK CIRCUIT)

OPERATOR ACTION

Operator moves pushout lever inward while depressing speed up button.

HYDRAULIC SEQUENCE

Fluid flows from the 2-spool directional valve through the hydraulic integrated circuit block (HIC) to the case end of the telescopic cylinder. When the pushout lever is moved rearward with the tailgate closed, an electrical switch on the 2-spool valve breaks the continuity and causes the solenoid valve and force limiting cartridge to provide a maximum of 700 psi to the pushout cylinder.



NOTE

The tailgate ajar electrical system which energizes the telescopic solenoid must be functioning or compaction rates will be below normal due to the bleeding off of internal telescopic cylinder pressure which is required

to maintain resistance against the load. Adjusting the resistance cartridge will not compensate for a defective tailgate ajar electrical system.

Pressure Exhaust



## SECTION 10

# OPTIONAL TELESCOPIC PUSHOUT

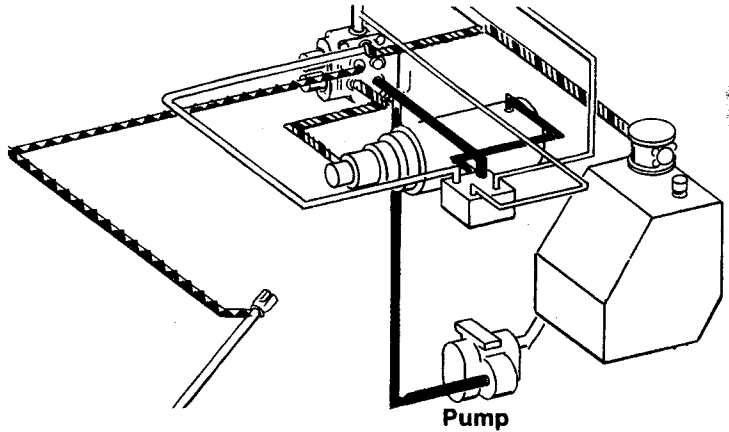
## EJECTING LOAD

### OPERATOR ACTION

Raise tailgate and move pushout lever rearward while depressing speed-up button.

### HYDRAULIC SEQUENCE

Fluid flows from the 2-spool directional valve to the case end of the telescopic cylinder. Since the tailgate is raised and the dash mounted tailgate ajar light is lighted, the pressure is not effected by the force limiting cartridge and full system pressure (1650 psi) is provided to eject the load.



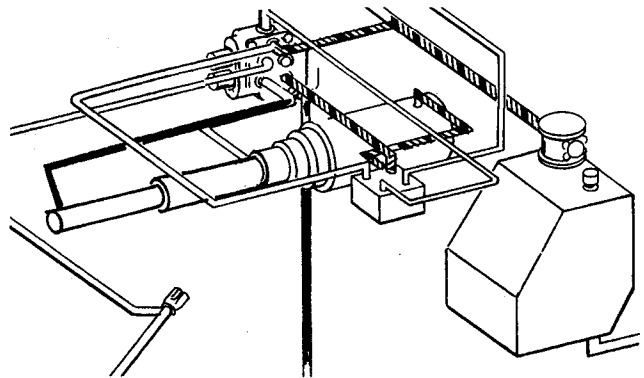
## RETRACTING PUSHOUT CYLINDER MANUAL

### OPERATOR ACTION

Operator pulls pushout lever forward. (Do not use speed-up button).

### HYDRAULIC SEQUENCE

Fluid flows from the 2-spool directional valve directly to the rod end of the telescopic cylinder and the cylinder retracts. Exhaust fluid flows directly through the telescopic valve block and 2-spool valve to tank.



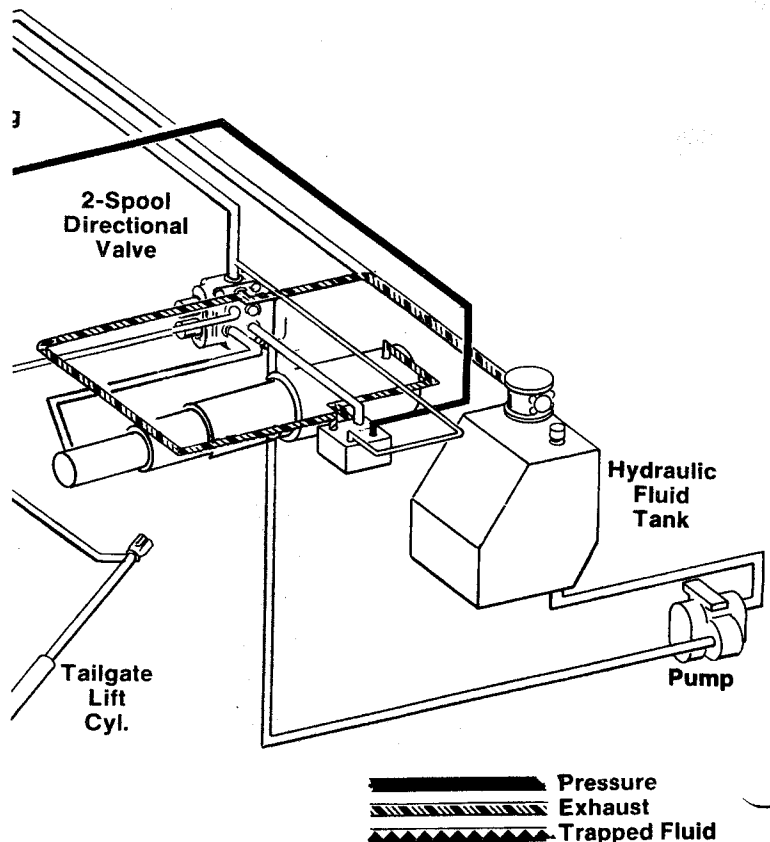
## RESISTANCE CIRCUIT DURING PACKING CYCLE

### HYDRAULIC SEQUENCE

To begin loading, the telescopic pushout cylinder is fully extended with the pushout plate at the extreme rear of the body. As refuse is compacted, the pressure inside the carrier cylinders is being monitored by the resistance cartridge. When the pressure in the carrier cylinders reach a preset level of 1000 psi, the resistance cartridge is opened allowing fluid to escape from the telescopic cylinder case end which results in the pushout plate being moved forward by the compacted refuse. When the main operating valve shifts to neutral (knockout), pump pressure reduces and a check cartridge closes so fluid is again trapped in the telescopic pushout cylinder, thus maintaining compaction force on the load. This process is repeated until the pushout plate is at the front of the body.

### NOTE

*If the resistance pressure is set for maximum load density, the pushout plate may not move automatically to the front of the body. The packer plate may also stop short of the home position. To operate the unit at this setting, either manually retract the pushout cylinder and override the packer operating lever or reduce the resistance pressure.*





## OPTIONAL TELESCOPIC PUSHOUT

## TROUBLESHOOTING

## GENERAL

The first step in any repair process is identifying the cause of the problem. The Troubleshooting charts shown in Section 8 (Troubleshooting) deal with the overall unit. The diagnostic charts shown below suggest possible remedies when dealing with the telescopic pushout system.

POSSIBLE CAUSE	REMEDY
<b>LOUD SQUEALING NOISE WHEN MANUALLY RETRACTING CYLINDER</b>	
<ol style="list-style-type: none"> <li>1. Excessive fluid flow being forced through main relief in 2-spool valve.</li> </ol>	<ol style="list-style-type: none"> <li>1a. Release speed-up button.</li> <li>1b. Only partially pull (feather) control handle.</li> <li>1c. Slightly increase or decrease main relief pressure setting. See SECTION 7, CHECKOUT</li> </ol>
<b>LOAD WILL NOT PUSHOUT</b>	
<ol style="list-style-type: none"> <li>1. Less than full pressure in telescopic cylinder.</li> <li>2. Operator trying to push load out against pile of refuse, dirt, or bank of hill.</li> </ol>	<ol style="list-style-type: none"> <li>1a. Check Anti-Backpacking components. See SECTION 10, TELESCOPIC CHECKOUT.</li> <li>1b. Perform test for leaking cylinder and repair.</li> <li>1c. Adjust main relief pressure. See SECTION 7 CHECKOUT.</li> <li>1d. Replace pump, see SECTION 9, SERVICE AND REPAIR.</li> <li>2. Move unit forward to finish unloading.</li> </ol>
<b>PUSHOUT PLATE SLIDES FORWARD TOO FAST WHILE PACKING REFUSE</b>	
<ol style="list-style-type: none"> <li>1. Anti-Back packing components not working.</li> <li>2. Cylinder bypassing.</li> <li>3. Resistance setting too low.</li> <li>4. Orifice Plug missing from HIC valve.</li> </ol>	<ol style="list-style-type: none"> <li>1a. Check tailgate open switch for faulty ground.</li> <li>1b. Telescopic relay not being grounded through Anti-Backpack and/or tailgate open switches.</li> <li>1c. Telescopic relay defective.</li> <li>1d. Wire broke between telescopic relay, front junction box and telescopic solenoid.</li> <li>2. Perform test for leaking cylinder.</li> <li>3. Adjust resistance cartridge.</li> <li>4. Install Plug.</li> </ol>
<b>PUSHOUT PLATE WILL NOT SLIDE FORWARD AUTOMATICALLY</b>	
<ol style="list-style-type: none"> <li>1. Resistance setting too high.</li> <li>2. Packer Plate not applying full force to move pushout plate forward.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust resistance setting.</li> <li>2a. Check pressures.</li> <li>2b. Check pump.</li> </ol>
<b>CARRIER AND PACKING PLATE STOP SHORT OF HOME POSITION AFTER EACH CYCLE</b>	
<ol style="list-style-type: none"> <li>1. Truck full.</li> <li>2. Resistance too high.</li> <li>3. Pump defective.</li> </ol>	<ol style="list-style-type: none"> <li>1. Empty packer.</li> <li>2. Reduce resistance setting.</li> <li>3. Check flow rate.</li> </ol>



**OPTIONAL TELESCOPIC PUSHOUT**

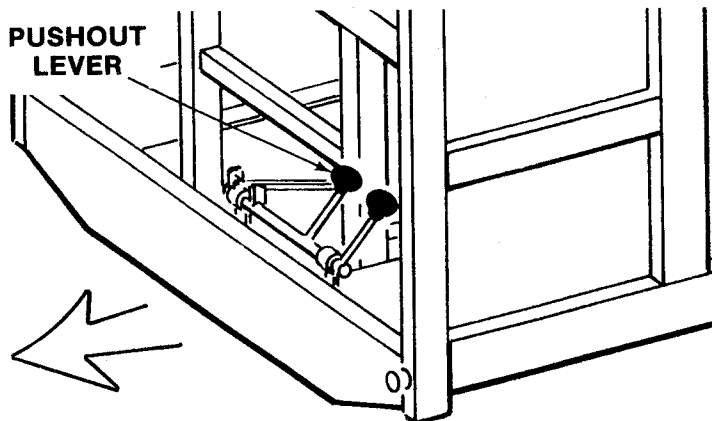
**SERVICE AND REPAIR**

**REMOVAL OF TELESCOPIC CYLINDER**

**Operational Status**

Truck	Running	PTO	Engaged	Sol. Sw.	On
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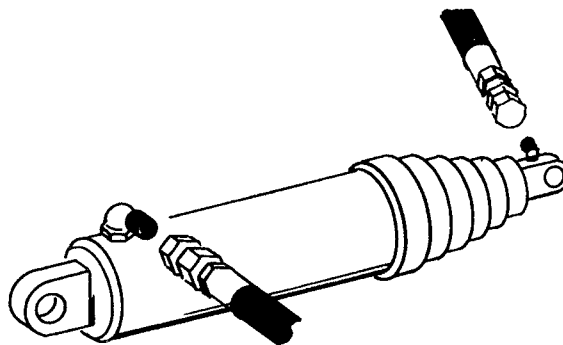
1. Pull pushout lever forward and hold to completely retract cylinder.



**Operational Status**

Truck	Off	Keys	Removed
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2. Disconnect and cap hydraulic lines to the cylinder.

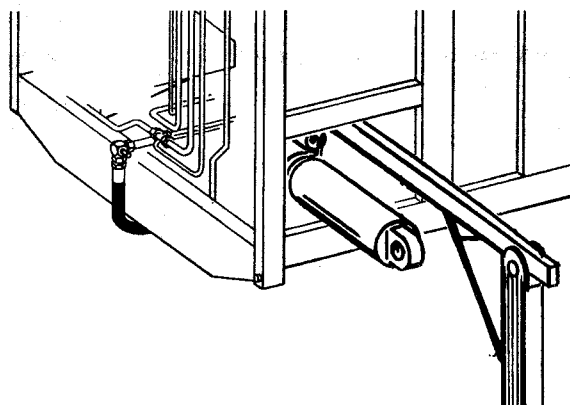


3. Attach a sling connected to a suitable lifting device with a minimum lifting capacity of 1000 lbs. as shown.

**NOTE**

*For more information about lifting devices and slings refer to Sec. 4, GENERAL REPAIR PRACTICES.*

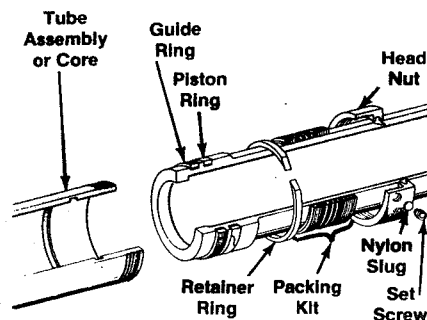
4. Disconnect telescopic pushout cylinder at both ends.
5. Operate lifting device slowly and guide cylinder through side access door and out of body using care not to damage surrounding components or hydraulic lines.



**SERVICE AND REPAIR**

(See Sec. 4 for information about GENERAL REPAIR PRACTICES).

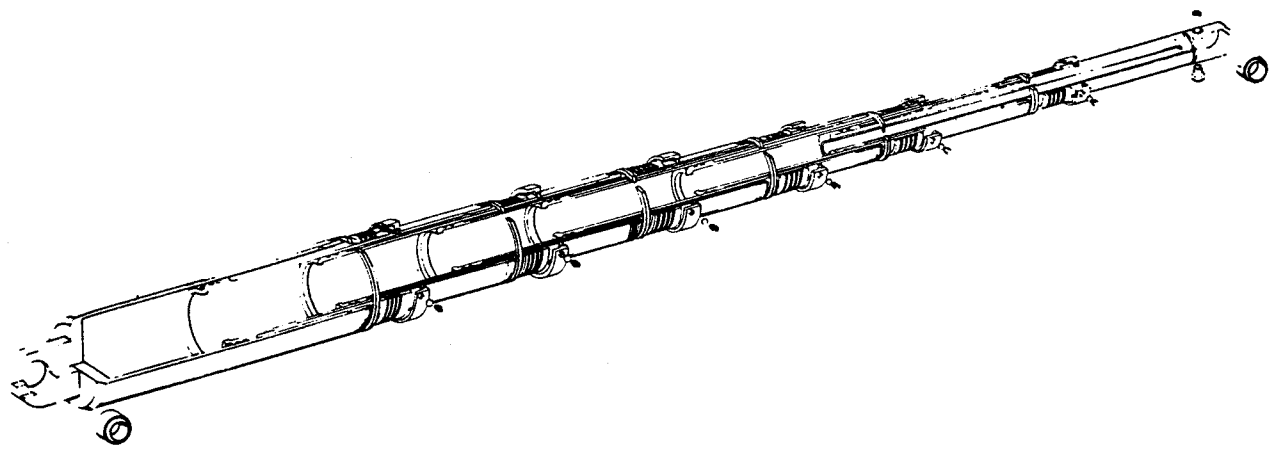
1. Secure the cylinder end to a floor stand or work bench.
2. Attach a sling or chain to the rod end of cylinder.
3. Refer to the accompanying view and disassemble cylinder one stage at a time by loosening set-screw, removing packing nuts, retainer ring, and operating lifting device.



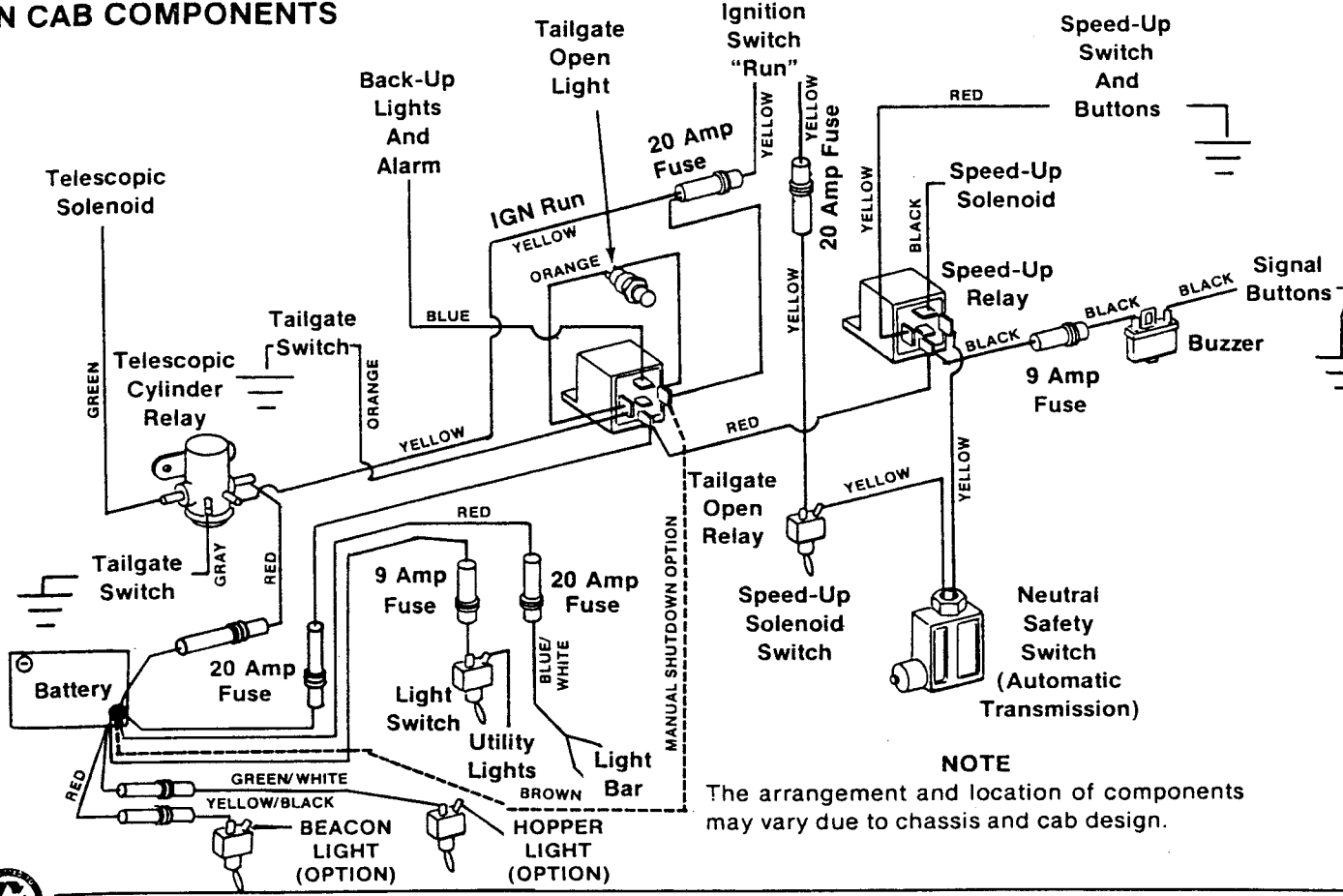
**OPTIONAL TELESCOPIC PUSHOUT**

**REASSEMBLY OF TELESCOPIC CYLINDER**

1. Replace packing kits for each stage and reassemble cylinder in reverse order of disassembly.



**IN CAB COMPONENTS**



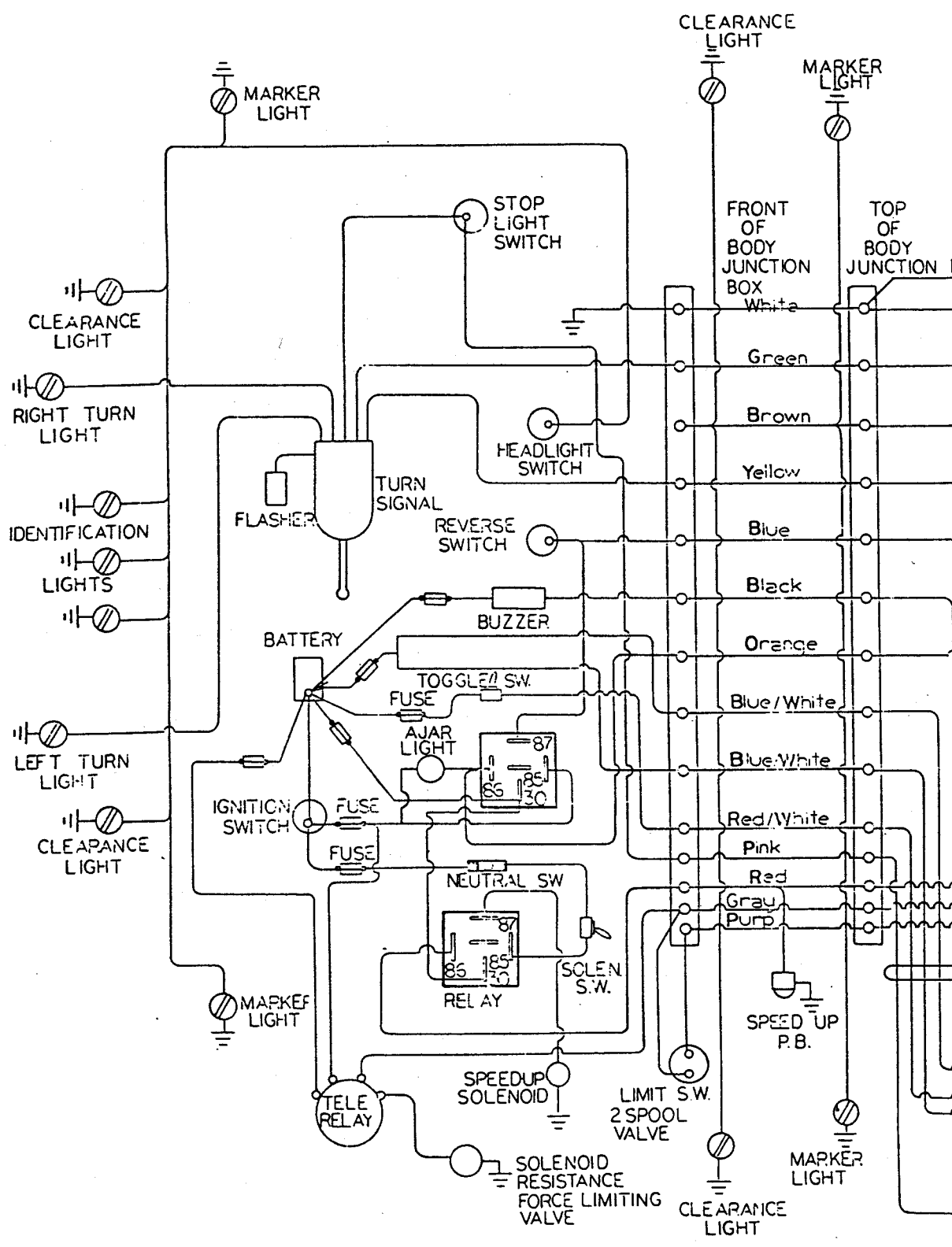
**NOTE**

The arrangement and location of components may vary due to chassis and cab design.

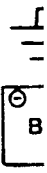


# ELECTRICAL SCHEMATIC — TELESCOPIC

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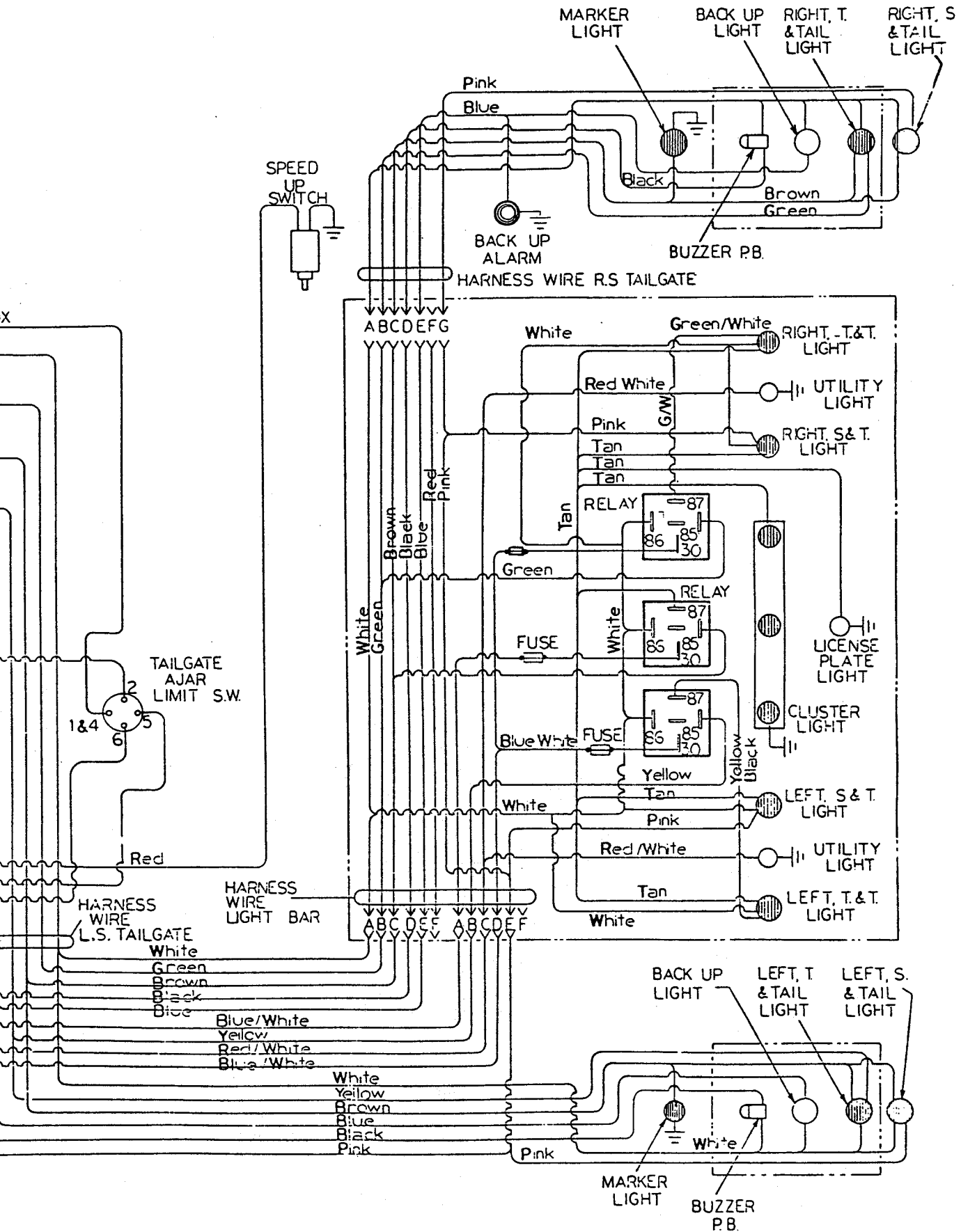


INC



# SECTION 10

## OPTIONAL TELE PUSHOUT



**GENERAL**

The service tools shown will be required for some service and repair procedures. These tools are available from your local authorized LEACH distributor.

The actual use of each tool is described in SERVICE AND REPAIR of the appropriate service manual.

<b>PART NO.</b>	<b>DESCRIPTION</b>	<b>EXPLANATION</b>	<b>UNIT</b>
30522	Pressure Gauge	To measure system pressure	All except FL-104/Beta
T-SK-793-100	Pin Puller	Remove pivot pins	All
T-19516-6	Knockout Spring Tool	Remove and install spring	2R/2RII/SCII SIII/Alpha/T-3
T-B19516-4-626	Packing Tool	Install Chevron packings in MOV	2R/2RII/SCII SIII/Alpha/T-3
T-B19516-4-751	Packing Tool	Install Chevron packing in MOV	2R/2RII/SCII SIII/Alpha/T-3
T-14284	Plug Wench	Disassemble check valve on HIC block	2RII/SCII Alpha
T-2R-1006-2	Tube Nut Wrench 1½"	Remove/Install tube nut	2R/2RII
T-2R-1313-2	Tube Nut Wrench 2"	Remove/Install tube nut	2R/2RII
T-SR-9541-20	Pump Shaft Seal Tool	Install seal	All
T-SR-6021-2	U-Cup Guide	Install U-Cups	2R/2RII
100368	Snap Connector	Quick coupling for pressure gauges	All
402325	Pivot Puller	Remove upper carrier pivots	2RII
T-NR-246-247-10	Cup Guide	Install U-Cups	Standard T-3/SCII
T-PO-1166-10	Spanner Wrench	Remove cylinder cap	2R
103081	O-Ring Kit	Various size o-rings	All Except FL-104
T-14346	Pin Puller	Remove telescopic rod end pin	2RII





# LEACH SERVICE ORDER FORM MANUALS AND LITERATURE

No.	Title	List Price	Quantity	Extended
	<b>Current Production Units</b>	(each)		
105291	2RII Parts (over S/N 9719)	\$7.00		
105606	2RII Operators (over S/N 9719)	\$7.00		
105615	2RII Service (over S/N 9719)	\$7.00		
105295	Millennium Parts	\$7.00		
105296	Millennium Operators	\$7.00		
105297	Millennium Service	\$7.00		
105290	Curbtender Parts (over S/N 13681)	\$7.00		
105288	Curbtender Operators (over S/N 13681)	\$7.00		
105289	Curbtender Service (over S/N 13681)	\$7.00		
105284	Alpha, Beta, Delta Parts (over S/N 3500)	\$7.00		
105283	Alpha, Beta, Delta Operators (over S/N 3500)	\$7.00		
105282	Alpha, Beta, Delta Service (over S/N 3500)	\$7.00		
	<b>Leach Previous Production Units</b>			
105546	2RII Parts (S/N 8993-9718)	\$7.00		
105549	2RII Service (S/N 8993-9718)	\$7.00		
105567	2RII Parts (S/N 6972-8993)	\$7.00		
105544	2RII Service (S/N 6972-8993)	\$7.00		
105600	2RII Parts (S/N 0001-6972)	\$7.00		
105601	2RII Service (S/N 0001-6972)	\$7.00		
105616	FL-104 Series B Parts (over S/N 1322)	\$7.00		
105596	FL-104 Series B Service (over S/N 1322)	\$7.00		
105571	FL-104 Parts (S/N 0001-1321)	\$7.00		
105602	FL-104 Service (S/N 0001-1321)	\$7.00		
102535	FL 104 Ops			
105550	FL 104 (A) Service			
105408	FL 104 (A) Ops			
105557	Alpha Parts (S/N 2140-3500)	\$7.00		
105556	Alpha Service (S/N 2140-3500)	\$7.00		
105543	Alpha Ops			
105555	Alpha Ops (S/N 2140)			
105566	Alpha Parts (S/N 0001-2139)	\$7.00		
105559	Alpha Service (S/N 0001-2139)	\$7.00		
105562	Beta Parts (Over S/N 2140)	\$7.00		
105561	Beta Service (Over S/N 2140)	\$7.00		
105519	Beta Ops			
105560	Beta Ops (S/N 2140)			
105565	Beta Parts (S/N 0001-2139)	\$7.00		
105563	Beta Service (S/N 0001-2139)	\$7.00		
105591	SCII Parts	\$7.00		
105536	SCII Service	\$7.00		



# LEACH SERVICE ORDER FORM MANUALS AND LITERATURE

No.	Title	List Price	Quantity	Extended
105531	SIII Parts	\$7.00	_____	_____
105581	SIII Service	\$7.00	_____	_____
105533	2R Packmaster Parts	\$7.00	_____	_____
105603	2R Service	\$7.00	_____	_____
102526	SaniCruiser Parts	\$7.00	_____	_____
102531	2F Front Loader Parts	\$7.00	_____	_____
102450	2F Front Loader Service	\$7.00	_____	_____
<b>Other Leach Publications</b>				
105599	Rear Loader Mounting	\$7.00	_____	_____
105620	Rear Loaders Container Handling Systems	\$7.00	_____	_____
105605	Chassis Requirements Manual	\$7.00	_____	_____
<b>Leach Safety Items</b>				
105590	Safety Booklet	N/C	_____	_____
LSAFE	Safety Wall Posters (6 per set)	N/C	_____	_____
<b>VacAll Current Production Units</b>				
NA	E5/E10 Operators 3600		_____	_____
NA	E5/E10 Parts 3600		_____	_____
NA	E5/E10 Service 3600		_____	_____
<b>VacAll Previous Production Units</b>				
102528	E5/E10 Parts		_____	_____
105540	E5/E10 Service		_____	_____
105411	VSS812 Operators		_____	_____
105413	VSS812 Parts		_____	_____
105412	VSS812 Service		_____	_____
102478	L-400B Leaf Loader Op/Parts/Service		_____	_____
<b>VacAll Safety Items</b>				
105532	Safety Booklets		_____	_____
VSAFE	Safety Wall Posters (3 per set)		_____	_____
<b>Miscellaneous Items</b>				
105440	E5/E10 Parts		_____	_____
<b>TOTAL ENCLOSED</b>			_____	_____

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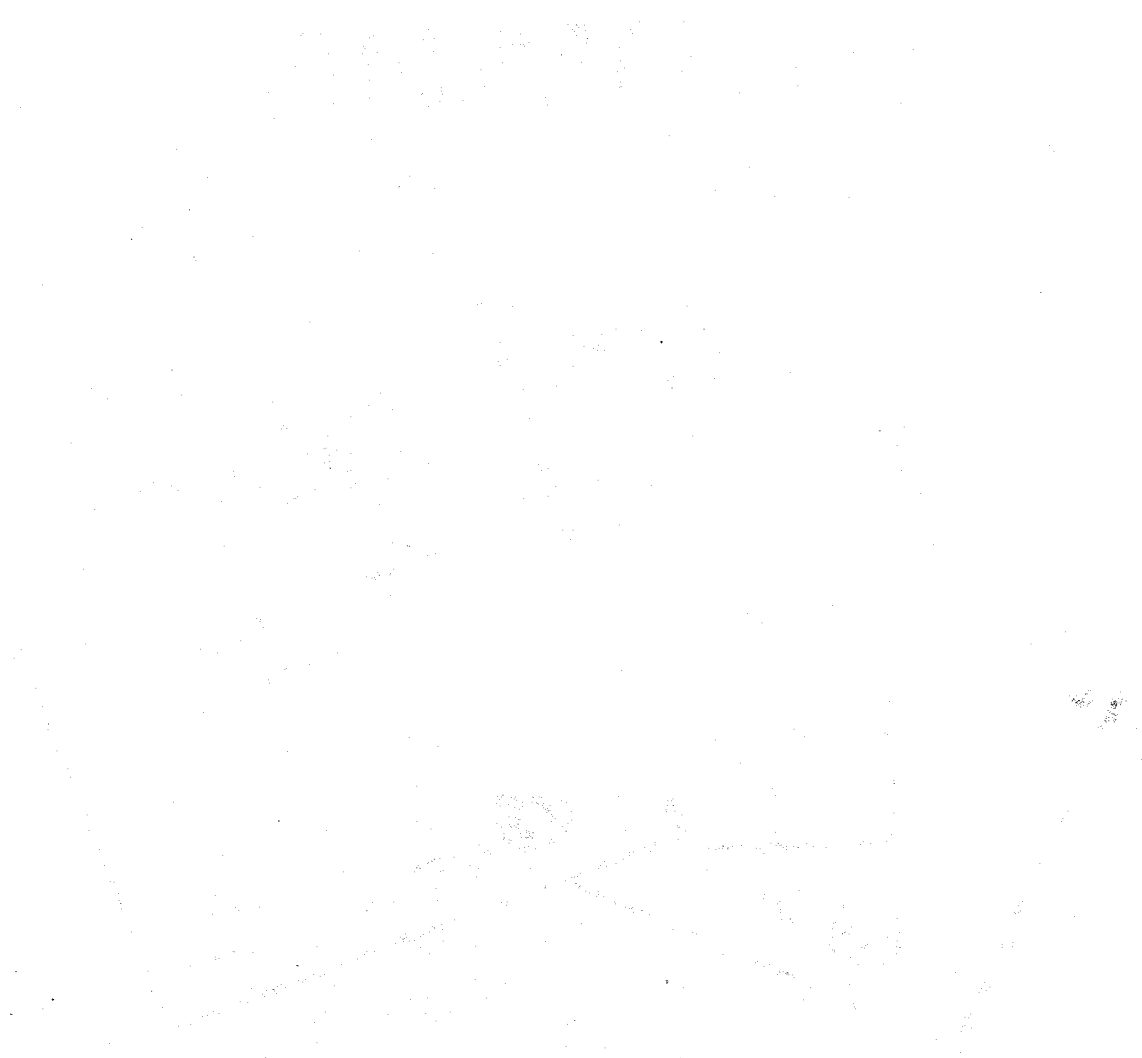
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*[The following text is extremely faint and illegible due to low contrast and heavy noise. It appears to be a multi-paragraph document or a list of items.]*