

**CLARK**  
EQUIPMENT

INDUSTRIAL TRUCK DIVISION

**CLARK**  
EQUIPMENT

# OPERATORS MANUAL

CY60, CY70, CY80

CFY60, CFY70, CFY80

C60, C70, C80

CH60, CH70, CH80

CHY60, CHY70, CHY80

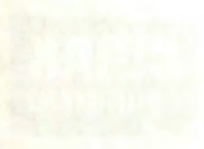
Effective Serial Numbers

First Machine of Lot 406 thru Last Machine of Lot 2078 (1960 - 1970)

Book No. 0-126-1 REV-4  
Printing NOV 80 REPRINT

**CLARK EQUIPMENT COMPANY, INDUSTRIAL TRUCK DIVISION**

CUSTOMER SERVICES PUBLICATION DEPARTMENT  
BATTLE CREEK, MICHIGAN, U.S.A. 49016



OPERATORS

MANUAL

## **SAFETY INSTRUCTIONS** FOR MAINTAINING INDUSTRIAL TRUCKS

Powered industrial trucks may become hazardous if adequate maintenance is neglected. Therefore, adequate maintenance facilities, personnel and procedures should be provided.

Maintenance and inspection of all powered industrial trucks should be performed in conformance with the recommendation in this manual and the following practices.

1. A scheduled preventive maintenance, lubrication, and inspection system should be followed.
2. Only qualified and authorized personnel should be permitted to maintain, repair, adjust, and inspect industrial trucks.

3. Before Leaving The Truck:

- A. Stop truck.
- B. Fully lower the load engaging means.
- C. Place directional controls in neutral.
- D. Apply the parking brake.
- E. Stop the engine or turn off power.
- F. Lock the control or ignition circuit.
- G. Block the wheels if truck is on a ramp, or being worked on.

4. Before Working On Truck:

- A. Raise wheels free of floor or disconnect power source.
- B. Use chocks or other positive truck positioning devices.
- C. Block load engaging means, innermast(s), or chassis before working under them.

Before working on engine fuel system of gasoline powered trucks with gravity feed fuel systems, be sure fuel shutoff valve is closed.

Before working on engine fuel system of LP gas powered trucks, close LP gas cylinder valve and run engine until fuel in system is depleted and engine stops running.

Operation to check performance of the truck or attachments should be conducted in an authorized, safe clearance area.

5. Before Starting To Operate The Truck:

- A. Be in operating position.
- B. Depress clutch (or brake pedal on automatic transmission and electric trucks).
- C. Place directional controls in neutral.
- D. Start engine or turn on power.
- E. Before operating truck, check functioning of lift and tilt systems, directional and speed controls, steering, warning devices, brakes, and any attachment. (If used)
- F. Release parking brake.

- continued -

## **SAFETY INSTRUCTIONS** FOR MAINTAINING INDUSTRIAL TRUCKS

6. Avoid fire hazards and have fire protection equipment present. Do not use an open flame to check level, or for leakage, of fuel, electrolyte or coolant. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.
7. Properly ventilate work area, vent exhaust fumes and keep shop clean and floor dry.
8. Handle LP gas cylinders with care. Do not drop, dent, or damage in any way.
9. Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, lift overload devices, guards and safety devices should be inspected regularly and maintained in a safe operating condition.
10. All parts of lift and tilt mechanisms and frame members should be carefully and regularly inspected and maintained in a safe operating condition.
11. Special trucks or devices designed and approved for hazardous area operation should receive special attention to ensure that maintenance preserves the original, approved safe operating features.
12. Fuel systems should be checked for leaks and condition of parts. Extra special consideration should be given in the case of a leak in the fuel system. Action should be taken to prevent the use of the truck until the leak has been corrected.
13. All hydraulic systems should be regularly inspected and maintained in conformance with good practice. Tilt cylinders, valves, and other similar parts should be checked to assure that "drift" has not developed to the extent that it would create a hazard.
14. Capacity, operation and maintenance instructions plates, tags, or decals should be maintained in legible condition.
15. Batteries, motors, controllers, limit switches, protective devices, electrical conductors and connections should be inspected and maintained in conformance with good practice. Special attention should be paid to the condition of electrical insulation.
16. Industrial trucks should be kept in a clean condition to minimize fire hazards and facilitate detection of loose or defective parts.
17. Modifications and additions which affect capacity and safe truck operation should not be performed by the customer or user without manufacturers prior written approval. Capacity, operation and maintenance instruction plates, tags or decals should be changed accordingly.
18. Care should be taken to assure that all replacement parts are interchangeable with the original parts and of a quality equal to that provided in the original equipment.



# INDUSTRIAL TRUCK DIVISION



## P L E A S E     N O T E

### I N S T R U C T I O N S     O N     U S E     O F     M A N U A L

This Operator's Manual is published as a service reference guide and includes Specifications, Operating Instructions, Lubrication and Preventive Maintenance Instructions, and Trouble Shooting Guide.

The TABLE OF CONTENTS for this manual is printed on green paper and is placed at the front for easy reference. A separate INDEX (also printed on green paper) is placed in front of the Lubrication and Preventive Maintenance Section.

Lubrication and Preventive Maintenance Instructions are listed under the TIME INTERVALS that they should be performed.

The TIME INTERVAL is part of the page number and code number.

Example: 8H 002-0; 8H is the TIME INTERVAL (8 operating hours), 002 is the PAGE NUMBER, and -0 is a CODE NUMBER that you as a customer should disregard. The dash number or code number is for the benefit of the publisher only.

The INDEX is set up under the TIME INTERVALS that the Lubrication and Preventive Maintenance should be performed.

Example: (8 Hours)	Time Interval (H=Hours)	&	Page Number (000-)
	Hydraulic Sump Tank, level check...	8H	503
	Brake Pedal Free Travel, check.....	8H	373

The above states to check the sump tank fluid level every 8 operating hours and refer to page 503 for fluid recommendations etc. Also, to check brake pedal free travel at this interval and turn to page 373 for instructions.

Turn to the eight (8) hour section (8H) and then to the page listed — 503 or 373 etc. The instructions covered therein will pertain only to the checks or adjustments that should be performed at this TIME INTERVAL.

If, for instance, the Brake Pedal Free Travel is incorrect, you would then refer to the INDEX for "Brake Pedal Free Travel, adjust" which would be listed in the TIME INTERVALS following the 8 hour section.

<u>Example:</u> (100 Hours)	Time Interval (H=Hours)	&	Page Number (000-)
	Brake Pedal Free Travel, adjust....	100H	302

Turn to the one hundred hour section (100H) and then to



# INDUSTRIAL TRUCK DIVISION



(continued)

## I N S T R U C T I O N S    O N    U S E    O F    M A N U A L

page 302. Complete instructions as to the importance of pedal free travel, the method to check and adjust for correct free travel with illustrations are included therein.

### N O T E

YOU WILL NOTE THAT AT THE BEGINNING OF EVERY SECTION A LUBRICATION AND PREVENTIVE MAINTENANCE ILLUSTRATION IS SHOWN GIVING THE LOCATION OF THE COMPONENTS TO BE SERVICED.

It is impossible to cover all types of machine operations in one manual. Operating conditions should determine the lubrication and maintenance intervals. Common sense and a close observance can best determine the frequency with which you should service your machine.

The care you give your machine will greatly determine the satisfaction and service life that you will obtain from it. A definite maintenance program should be set up and followed. Haphazard maintenance will only lead to faulty performance and short life.



# INDUSTRIAL TRUCK DIVISION



## TABLE OF CONTENTS

<u>Page</u>	<u>Description</u>
A001	Instructions on use of manual
A002	Instructions on use of manual
A003	Table of contents
A004	Table of contents
B001	Illustration of machine
B003	Specifications
B004	Specifications
B005	Specifications
B006	Specifications
B007	Specifications
B031	Specifications

## O P E R A T I O N S

C002	Overall controls
C003	Instrument indicators
C004	Instrument indicators
C103	Starting instructions
C133	Diesel starting aid
C134	Diesel shut-down procedures
C203	Reserve fuel cut-in valve
C253	Transmission shock valve
C303	Safety precautions
C401	Proper handling of L.P. gas
C402	Proper handling of L.P. gas
C403	Proper handling of L.P. gas
C404	Proper handling of L.P. gas

## L U B R I C A T I O N   A N D   P R E V E N T I V E   M A I N T E N A N C E

<u>Time Interval (H=Hours)</u>	<u>Page Number (0000-)</u>	<u>Description</u>
H	001	Index
H	002	Index
8H	002	<u>8 Hour Lubrication and Preventive Maintenance Illustration</u>
8H	003	Engine crankcase check
8H	103	Engine cooling system check
8H	203	Instrument indicators check
8H	204	Instrument indicators check
8H	303	Brake pedal free travel, parking brake check
8H	403	Air cleaner check
8H	404	Air filter element clean
8H	503	Hydraulic sump and control levers check
8H	602	Tire and rim maintenance
8H	603	Tire and rim maintenance
8H	604	Directional tread tires
8H	703	Power steering pump
100H	002	<u>100 Hour Lubrication and Preventive Maintenance Illustration</u>
100H	003	Engine crankcase and oil filter check
100H	103	Cooling system check
100H	203	Fan and generator drive belt check
100H	302	Brake pedal free travel check
100H	303	Brake system check
100H	304	Master cylinder check
100H	403	Lifting mechanisms check
100H	503	Hydraulic sump tank breather
100H	603	Steering gear and battery check
100H	604	Battery check
100H	703	Lubrication chart



# INDUSTRIAL TRUCK DIVISION



## TABLE OF CONTENTS

### LUBRICATION AND PREVENTIVE MAINTENANCE

Time Interval (H=Hours)	Page Number (0000-)	Description
500H	002	<u>Lubrication and preventive maintenance illustration</u>
500H	003	Transmission oil filter check
500H	004	Hydraulic sump tank and filter check
500H	103	Hydraulic sump tank and filter check
500H	202	Steering gear adjust
500H	203	Steering gear adjust
500H	302	Steering axle and linkage adjustments
500H	303	Steering axle and linkage adjustments
500H	403	Manifolds check
1000H	002	<u>Lubrication and preventive maintenance illustration</u>
1000H	003	Cylinder head, manifolds, crankcase, and valves adjustments
1000H	004	Valve adjustment
1000H	103	Compression test
1000H	203	Distributor adjustments
1000H	204	Distributor adjustments
1000H	303	Distributor adjustments and timing
1000H	304	Timing
1000H	403	Vacuum Test
1000H	503	Governor adjustment
1000H	504	Governor adjustment
1000H	603	Starting motor
1000H	604	Starting motor
1000H	703	Generator adjustment
1000H	704	Generator adjustment
1000H	803	Steer wheel bearings lubrication
1000H	805	Axle ends lubrication
1000H	912	Brake bleeding procedure
1000H	913	Brake bleeding procedure
1000H	1003	Brakes service
1000H	1103	Hand brake adjustment
1000H	1202	Cooling system inspect and clean
1000H	1203	Cooling system inspect and clean
1000H	1503	Hydraulic system check
1000H	1504	Hydraulic system check
1000H	1505	Hydraulic system check
1000H	1507	Hydraulic system check
1000H	1703	Transmission stall and pressure checks
1000H	1704	Transmission stall and pressure checks
1000H	1705	Battery check
1000H	1793	Neutral starting switch
1000H	1803	Lift and upright adjustments
1000H	1806	Roller adjustments
1000H	1807	Upright roller adjustments
1000H	1808	Upright roller adjustments
1000H	1811	Lift carriage roller adjustments
1000H	1812	Lift carriage roller adjustments
1000H	1815	Upright roller adjustment

### TROUBLE SHOOTING GUIDE

Page	Description	Page	Description
TS 001	Engine	TS 483	Drive axle
TS 251	Fuel system	TS 521	Steering axle
TS 321	Cooling system	TS 531	Steering
TS 341	Ignition system	TS 541	Brakes
TS 361	Starting motor	TS 653	Hydraulic system
TS 381	Generator troubles	TS 963	Transmission, converter and axle adaptor (hydrator drive)
TS 401	Battery, lights and horn		



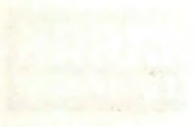
ILLUSTRATION OF MACHINE



Plate 7239. CLARKLIFT C60, C70, C80

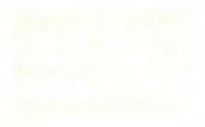


Plate 7240. CLARKLIFT CY60, CY70, CY80



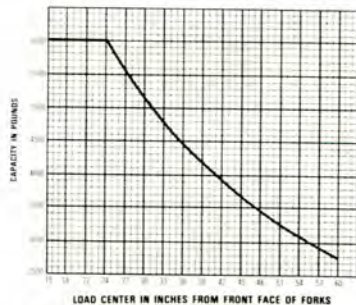
MOH...

ALG...



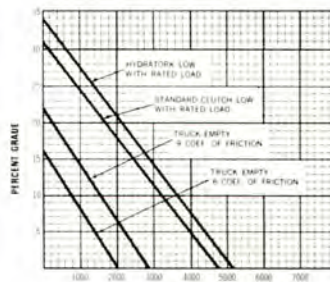
**CLARKLIFT®** **DIMENSIONAL SPECIFICATIONS**  
**C-60** **CF-60**

**CAPACITY CHART**



RATED CAPACITIES SHOWN ABOVE ARE COMPUTED WITH UPRIGHTS IN VERTICAL POSITION. THEY APPLY ONLY ON MAXIMUM FORK HEIGHTS UP TO AND INCLUDING 154"

**GRADE & DRAWBAR PULL CHART**



AVAILABLE DRAWBAR PULL IN POUNDS WITH TOWING COUPLER 12" FROM FLOOR. EMPTY TRUCK GRADES ARE WITH EITHER TRANSMISSION.

**UPRIGHT DIMENSIONAL TABLE**

Std. Hi-Lo	Max. Fork Ht.	TSU	Over-all Height		Free Lift	
			Lowered	Std.	Hi-Lo	TSU
76	—	—	56	13½	32¼	—
82	—	—	59	13½	35¼	—
88	—	—	62	13½	38¼	—
94	126	—	65	13½	41¼	11½
100	135	—	68	13½	44¼	11½
*106	*144	—	71	13½	47¼	11½
112	153	—	74	13½	50¼	11½
118	162	—	77	13½	53¼	11½
124	171	—	80	13½	56¼	11½
*130	*180	—	83	13½	59¼	11½
136	189	—	86	13½	62¼	9½
142	198	—	89	13½	65¼	9½
148	207	**	92	11½	68¼	9½
*154	*216	**	95	11½	71¼	9½
160	225	**	99	13½	75¼	9½
172	243	**	106	13½	82¼	9½
*178	252	**	109	11½	85¼	9½
184	—	—	112	11½	88¼	—
190	—	—	116	13½	92¼	—
196	—	—	119	11½	95¼	—
202	—	—	123	13½	99¼	—
208	—	—	126	11½	102¼	—

\*Preferred standard heights.

\*\*Add 1" for triple stage upright.

For overall height raised add 24¼" to maximum fork height.

**ENGINEERING SPECIFICATIONS**

**MODEL** C(F) 60 Weight 9,800 lbs.

**WEIGHT DISTRIBUTION AND CAPACITY** Percent on drive wheels, truck empty: 42%  
Rated capacity 6,000 lbs. at 24" load center  
Alternate ratings 5,100 lbs. at 30" load center  
4,400 lbs. at 36" load center  
(See capacity chart for other ratings)

**DIMENSIONS AND UNDERCLEARANCES**

<i>Dimensions</i>	
Length to face of forks	94¼"
Wheelbase	58"
Width (drive tires)	44"
Tread (drive)	35"
Tread (steer)	35½"
Turning radius	86"
Basic aisle for right angle stacking (add load length)	101⅞"
<i>Underclearances</i>	
Upright	37/16"
Drive axle	5 5/8"
Steer axle	3 3/4"
Center of frame	5 1/8"
Counterweight	4"

**SPEEDS AND GRADES**

Travel speeds with rated load	C 60	CF 60		
	10.5 mph	10.7 mph		
Gradeability with rated load	33.5%	30.5%		
	STANDARD	HI-LO		
	Loaded Empty	Loaded Empty		
Lift speed	71	78	65	72
Lowering speed	60	80	60	65

**ENGINE** Industrial Continental Red Seal, 6 cylinder, L-head, equipped with stellite-faced valves; seats, positive valve rotators. Connecting rods, main bearings, cam shaft and timing gears are pressure lubricated by submerged gear type pump. Mechanical governor controls engine speed accurately without choking off power.

Model	F-209
Bore	3 3/16"
Stroke	4 3/8"
Displacement — cubic inches	209
Crankcase capacity — quarts	5
Governed rpm with rated load	2250
Horsepower at governed rpm	65
Max. torque — lb. ft.	157
Fuel tank capacity — gals.	10.5

Note: LP Gas adaptation optional at extra cost.

**ENGINE FILTERS**

Three types. (1) Fuel filter in metallic bowl. (2) One quart oil filter with automotive-type replaceable cartridge. (3) Dry type in-take air filter that uses a replaceable pleated paper cartridge with minute 5-micron openings.

**ELECTRICAL SYSTEM**

12-volt, 60 amp-hour battery. 25 amp. low cut-in generator charges at idle. Other features include enclosed electric starter motor with positive engagement and electrical cut-out; weather-shielded key starting switch; dust-proof distributor; electric horn. Multiple-disconnect plug to instrument panel simplifies servicing.

**INSTRUMENTS**

Direct reading engine hour meter, ammeter, engine-oil pressure, fuel and temperature gauges, all mounted in cowl for easy reading.

**DRIVE AXLE AND TRANSMISSION**

Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full floating drive axle assembly. Axle housing, not drive shaft, carries weight of truck. Final gear reduction is made through fully enclosed pinion and ring gear at drive wheels.

**HYDRATORK® DRIVE, STANDARD**

2-speed power shifted transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled thru cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears and high and low range gears are in constant mesh. Direction selector lever for left-hand finger-tip control on steering column.

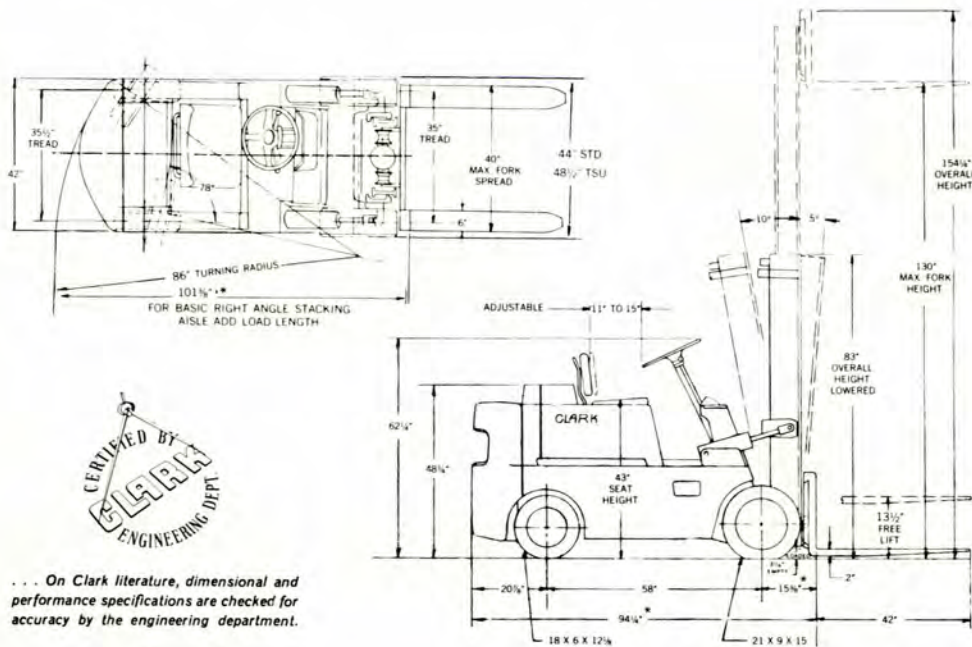
**HYDRAULIC INCHING**

In close quarters the "free pedal" portion of either the left or right foot inching-brake pedal, hydraulically actuates inching valve permitting power to be gradually disengaged from drive wheels, even when engine is running at top speed for fast lifting.

**FRICTION CLUTCH TRANSMISSION, OPTIONAL**

"Quick Change" 12" diameter single disc, dry plate clutch capacity of 300 lb. ft. of torque, controlled by low effort automotive type pedal. Two shift levers mounted on the steering column control the 3-speed synchronized transmission in either direction.

SPECIFICATIONS (CONTINUED)



... On Clark literature, dimensional and performance specifications are checked for accuracy by the engineering department.

\*ADD 1 1/2" FOR TRIPLE STAGE UPRIGHT

**BRAKES** (Two systems). Hydraulic spot disc brakes provide powerful braking without self-energization. Eliminates sudden "grabbing" of the brakes. Foot brake torque multiplied through final reduction at each drive wheel minimizes pedal effort. Brakes are enclosed within drive axle housing and require no adjustment for life of lining. Mechanical parking brake operates on transmission drive shaft.

**STEERING** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for floor level variations up to 3 1/2". Positive stops for lateral stability. Inclined king pins minimize road shocks. Recirculated ball type steering gear with 18" diameter handwheel. Tie rods are automotive type.

**UPRIGHT** Nested telescopic roller type. "I" beam inner section of SAE 1045 steel is nested within outer channel of SAE 1045 steel for greater safety and visibility. Side loading on upright rails is taken on upright rollers. Upright and carriage rollers are adjustable for wear to maintain new truck tolerances. Carriage also has 4 interior adjustable side thrust rollers to prevent binding. Carriage has additional lateral thrust rollers to prevent upright spread, insuring maximum free-rolling movement.

**LIFT AND TILT CYLINDERS** Tilt rods chrome plated. Externally removable shims compensate for wear on tilt cylinder gland packings. Tilt lock valves insure positive control — no upright drift. Both lift and tilt cylinders have metal rod wipers to keep foreign material from the packings. Free-floating mounting of piston type lift cylinder minimizes side strains. Modulated flow regulator in cylinder base reduces maximum lowering speed as weight of load increases.

**HYDRAULIC SYSTEM** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads. S.A.E. straight threads and O-ring seals used throughout pressure system. Vane-type pump is driven by hardened gears. Hydraulic sump, built into frame of 3/8" thick plate has 10 gal. capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filler cap breather, (2) a 25-micron full flow filter in sump.

**FORK CARRIAGE AND FORKS** All-welded construction, 1045 steel fork carriage to withstand impacts. Lateral fork adjustments from 0" to 40" with or without optional load rack. Convenient snap action latch assures positive fork positioning. Heat treated and upset forged forks to provide full section strength at heel.

**SEATING** Rubber mounted wide seat and back rest are Polyether, covered with vinyl plastic. Curved back rest tilts to provide additional driver comfort. An automotive type latch releases the seat for horizontal adjustment up to 4".

**MAINTENANCE** Split swing-out hood offers easy access for servicing. Check-points such as water and hydraulic sump filler caps, oil dip-stick and filler readily accessible. Battery swings out. Quickly detachable counterweight is hook mounted, secured with one large bolt.

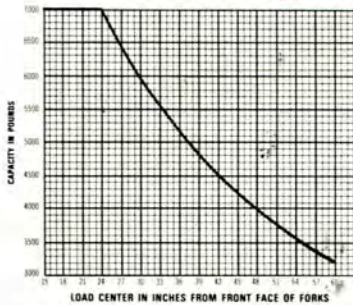
**GENERAL** Protectoseal gas tank filler cap. Auxiliary fuel supply — 1/2 gal. 12" height recessed pin-type coupler. Bolts and screws are zinc or cadmium plated. Multi-pass muffler. All exposed surfaces are shot-blasted and prime painted with weather resistant paint.

**DRIVER'S OVERHEAD GUARDS AND LOAD BACK RESTS** Driver's Overhead Guards and Load Back Rests are available as optional equipment. Clark Equipment Company recommends the use of these accessories and advises owner to consider his operation for their necessity.

**COLORS** Two tone. Silver gray, combined with one of five options: red, orange, yellow, green, or blue.

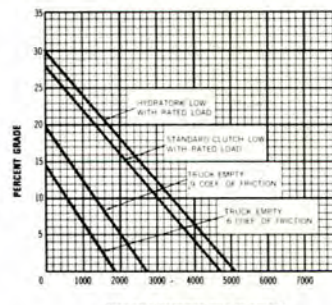
**CLARKLIFT® DIMENSIONAL SPECIFICATIONS**  
**C-70 CF-70**

**CAPACITY CHART**



RATED CAPACITIES SHOWN ABOVE ARE COMPUTED WITH UPRIGHTS IN VERTICAL POSITION. THEY APPLY ONLY ON MAXIMUM FORK HEIGHTS UP TO AND INCLUDING 154"

**GRADE & DRAWBAR PULL CHART**



AVAILABLE DRAWBAR PULL IN POUNDS WITH TOWING COUPLER 12" FROM FLOOR. EMPTY TRUCK GRADES ARE WITH EITHER TRANSMISSION.

**UPRIGHT DIMENSIONAL TABLE**

Std. Hi-Lo	TSU	Over-all Height		Free Lift		
		Lowered	Std.	Hi-Lo	TSU	
75	—	59	19½	35¾	—	
81	—	62	19½	38¾	—	
87	—	65	19½	41¾	—	
93	126	68	19½	44¾	17½	
* 99	135	71	19½	47¾	17½	
105	*144	74	19½	50¾	17½	
111	153	77	19½	53¾	17½	
117	162	80	19½	56¾	17½	
*123	171	83	19½	59¾	17½	
129	*180	86	19½	62¾	17½	
135	189	89	19½	65¾	15½	
141	198	** 92	19½	68¾	17½	
*147	207	** 95	17½	71¾	15½	
153	*216	** 99	19½	75¾	17½	
159	225	**102	19½	78¾	15½	
165	234	**106	19½	82¾	17½	
*171	243	**109	19½	85¾	15½	
177	—	112	17½	88¾	—	
183	—	116	19½	92¾	—	
189	—	119	19½	95¾	—	
195	—	123	19½	99¾	—	
201	—	126	19½	102¾	—	

\*Preferred standard heights.

\*\*Add 1" for triple stage upright.

For overall height raised add 24¼" to maximum fork height.

**ENGINEERING SPECIFICATIONS**

**MODEL** C(F) 70 Weight .....10,480 lbs. standard

**WEIGHT DISTRIBUTION AND CAPACITY** Percent on drive wheels, truck empty: 38%  
Rated capacity .....7,000 lbs. at 24" load center  
Alternate ratings .....5,900 lbs. at 30" load center  
.....5,150 lbs. at 36" load center  
(See capacity chart for other ratings)

**DIMENSIONS AND UNDERCLEARANCES** *Dimensions*  
Length (to face of forks) .....96½"  
Wheelbase .....58"  
Width (drive tires) .....44"  
Tread (drive) .....35"  
Tread (steer) .....35½"  
Turning radius .....87½"  
*Basic aisle for right angle stacking (add load length) .....102¾"*  
*Underclearances*  
Upright .....37¼"  
Drive axle .....5½"  
Steer axle .....3¾"  
Center of frame .....5½"  
Counterweight .....4"

**SPEEDS AND GRADES** Travel speeds with rated load C 70 CF 70  
10.5 mph 10.7 mph  
Gradeability with rated load 29.5% 27.5%  
*STANDARD HI-LO*  
*Loaded Empty Loaded Empty*  
Lift speed 71 78 65 72  
Lowering speed 60 80 60 65

**ENGINE** Industrial Continental Red Seal, 6 cylinder, L-head, equipped with stellite-faced valves; seats, positive valve rotators. Connecting rods, main bearings, cam shaft and timing gears are pressure lubricated by submerged gear type pump. Mechanical governor controls engine speed accurately without choking off power. Updraft carburetor.  
Model .....F-209  
Bore .....3¾"  
Stroke .....4¾"  
Displacement — cubic inches .....209  
Crankcase capacity — quarts .....5  
Governed rpm with rated load .....2250  
Horsepower at governed rpm .....65  
Max. torque — lb. ft. ....157  
Fuel tank capacity — gals. ....10.5  
Note: LP Gas adaptation optional at extra cost.

**ENGINE FILTERS**

Three types. (1) Fuel filter in metallic bowl. (2) One quart oil filter with automotive-type replaceable cartridge. (3) Dry type in-take air filter that uses a replaceable pleated paper cartridge with minute 5-micron openings.

**ELECTRICAL SYSTEM**

12-volt, 60 amp-hour battery, 25 amp. low cut-in generator charges at idle. Other features include enclosed electric starter motor with positive engagement and electrical cut-out; weather-shielded key starting switch; dust-proof distributor; electric horn. Multiple-disconnect plug to instrument panel simplifies servicing.

**INSTRUMENTS**

Direct reading engine hour meter, ammeter, engine-oil pressure, fuel and temperature gauges, all mounted in cowl for easy reading.

**DRIVE AXLE AND TRANSMISSION**

Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full floating drive axle assembly. Axle housing, not drive shaft, carries weight of truck. Final gear reduction is made through fully enclosed pinion and ring gear at drive wheels.

**HYDRATORK® DRIVE, STANDARD**

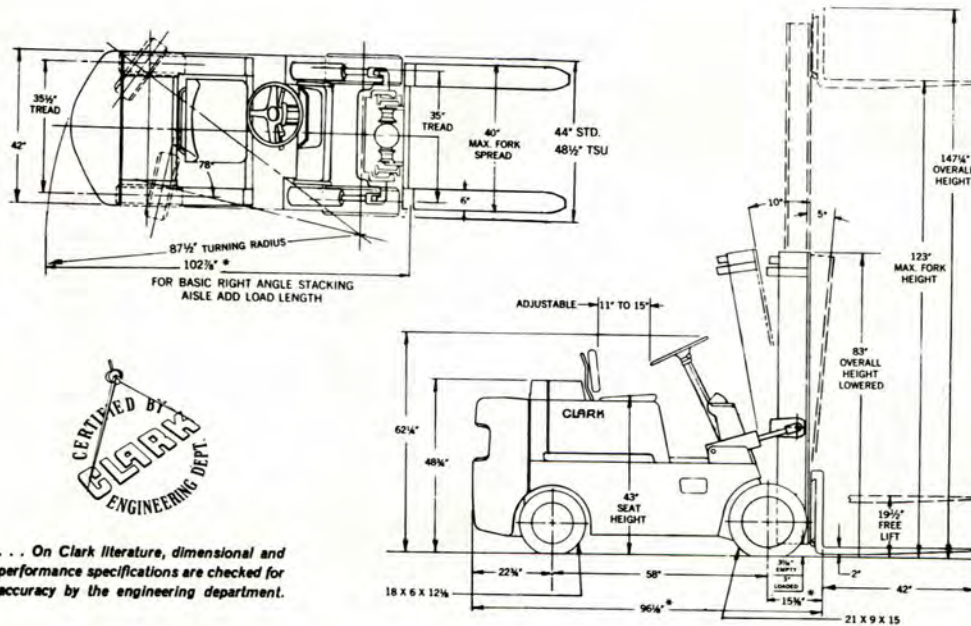
2-speed power shifted transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled thru cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears and high and low range gears are in constant mesh. Direction selector lever for left-hand finger-tip control on steering column.

**HYDRAULIC INCHING**

In close quarters the "free pedal" portion of either the left or right foot inching-brake pedal, hydraulically actuates inching valve permitting power to be gradually disengaged from drive wheels, even when engine is running at top speed for fast lifting.

**FRICTION CLUTCH TRANSMISSION, OPTIONAL**

"Quick Change" 12" diameter single disc, dry plate clutch capacity of 300 lb. ft. of torque, controlled by low effort automotive type pedal. Two shift levers, mounted on the steering column control the 3-speed synchronized transmission in either direction.



... On Clark literature, dimensional and performance specifications are checked for accuracy by the engineering department.

\*ADD 1 1/2" FOR TRIPLE STAGE UPRIGHT

**BRAKES** (Two systems). Hydraulic spot disc brakes provide powerful braking without self-energization. Eliminates sudden "grabbing" of the brakes. Foot brake torque multiplied through final reduction at each drive wheel minimizes pedal effort. Brakes are enclosed within drive axle housing and require no adjustment for life of lining. Mechanical parking brake operates on transmission drive shaft.

**STEERING** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for floor level variations up to 3 1/2". Positive stops for lateral stability. Inclined king pins minimize road shocks. Recirculated ball type steering gear with 18" diameter handwheel. Tie rods are automotive type.

**UPRIGHT** Nested telescopic roller type. "I" beam inner section of SAE 1045 steel is nested within outer channel of SAE 1045 steel for greater safety and visibility. Side loading on upright rails is taken on upright rollers. Upright and carriage rollers are adjustable for wear to maintain new truck tolerances. Carriage also has 4 interior adjustable side thrust rollers to prevent binding. Carriage has additional lateral thrust rollers to prevent upright spread, insuring maximum free-rolling movement.

**LIFT AND TILT CYLINDERS** Tilt rods chrome plated. Externally removable shims compensate for wear on tilt cylinder gland packings. Tilt lock valves insure positive control — no upright drift. Both lift and tilt cylinders have metal rod wipers to keep foreign material from the packings. Free-floating mounting of piston type lift cylinder minimizes side strains. Modulated flow regulator in cylinder base reduces maximum lowering speed as weight of load increases.

**HYDRAULIC SYSTEM** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads. S.A.E. straight threads and O-ring seals used throughout pressure system. Vane-type pump is driven by hardened gears. Hydraulic sump, built into frame of 3/8" thick plate has 10 gal. capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filler cap breather, (2) a 25-micron full flow filter in sump.

**FORK CARRIAGE AND FORKS** All-welded construction, 1045 steel fork carriage to withstand impacts. Lateral fork adjustments from 0" to 40" with or without optional load rack. Convenient snap action latch assures positive fork positioning. Heat treated and upset forged forks to provide full section strength at heel.

**SEATING** Rubber mounted wide seat and back rest are Polyether, covered with vinyl plastic. Curved back rest tilts to provide additional driver comfort. An automotive type latch releases the seat for horizontal adjustment up to 4".

**MAINTENANCE** Split swing-out hood offers easy access for servicing. Check-points such as water and hydraulic sump filler caps, oil dip-stick and filler readily accessible. Battery swings out. Quickly detachable counterweight is hook mounted, secured with one large bolt.

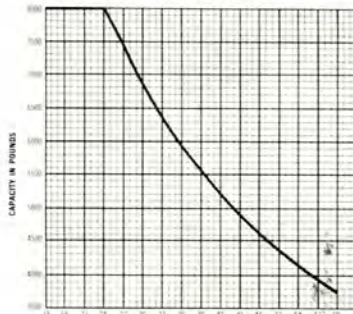
**GENERAL** Protectoseal gas tank filler cap. Auxiliary fuel supply — 1/2 gal. 12" height recessed pin-type coupler. Bolts and screws are zinc or cadmium plated. Multi-pass muffler. All exposed surfaces are shot-blasted and prime painted with weather resistant paint.

**DRIVER'S OVERHEAD GUARDS AND LOAD BACK RESTS** Driver's Overhead Guards and Load Back Rests are available as optional equipment. Clark Equipment Company recommends the use of these accessories and advises owner to consider his operation for their necessity.

**COLORS** Two tone. Silver gray, combined with one of five options: red, orange, yellow, green, or blue.

**CLARKLIFT® DIMENSIONAL SPECIFICATIONS**  
**C-80 CF-80**

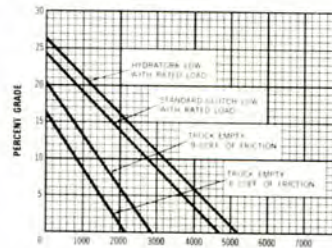
**CAPACITY CHART**



LOAD CENTER IN INCHES FROM FRONT FACE OF FORKS

RATED CAPACITIES SHOWN ABOVE ARE COMPUTED WITH UPRIGHTS IN VERTICAL POSITION. THEY APPLY ONLY ON MAXIMUM FORK HEIGHTS UP TO AND INCLUDING 15'4".

**GRADE & DRAWBAR PULL CHART**



AVAILABLE DRAWBAR PULL IN POUNDS

WITH TOWING COUPLER 11" FROM FLOOR  
EMPTY TRUCK GRADES ARE WITH EITHER TRANSMISSION

**UPRIGHT DIMENSIONAL TABLE**

Max. Fork Ht. Std. Hi-Lo	TSU	Over-all Height		Free Lift	
		Lowered	Std.	Hi-Lo	TSU
75	—	59	19½	35¼	—
81	—	62	19½	38¼	—
87	—	65	19½	41¼	—
93	126	68	19½	44¼	17½
* 99	135	71	19½	47¼	17½
105	*144	74	19½	50¼	17½
111	153	77	19½	53¼	17½
117	162	80	19½	56¼	17½
*123	171	83	19½	59¼	17½
129	*180	86	19½	62¼	17½
135	189	89	19½	65¼	15½
141	198	** 92	19½	68¼	17½
*147	207	** 95	17½	71¼	15½
153	*216	** 99	19½	75¼	17½
159	225	**102	19½	78¼	15½
165	234	**106	19½	82¼	17½
*171	243	**109	19½	85¼	15½
177	—	112	17½	88¼	—
183	—	116	19½	92¼	—
189	—	119	19½	95¼	—
195	—	123	19½	99¼	—
201	—	126	19½	102¼	—

\*Preferred standard heights.

\*\*Add 1" for triple stage upright.

For overall height raised add 2¼" to maximum fork height.

**ENGINEERING SPECIFICATIONS**

**MODEL** C(F) 80 Weight \_\_\_\_\_ 10,900 lbs. standard

**WEIGHT DISTRIBUTION AND CAPACITY** Percent on drive wheels, truck empty: 38%  
Rated capacity \_\_\_\_\_ 8,000 lbs. at 24" load center  
Alternate ratings \_\_\_\_\_ 6,800 lbs. at 30" load center  
\_\_\_\_\_ 6,400 lbs. at 36" load center  
(See capacity chart for other ratings)

**DIMENSIONS AND UNDERCLEARANCES** *Dimensions*  
Length (to face of forks) \_\_\_\_\_ 101½"  
Wheelbase \_\_\_\_\_ 63"  
Width (drive tires) \_\_\_\_\_ 46"  
Tread (drive) \_\_\_\_\_ 36"  
Tread (steer) \_\_\_\_\_ 35½"  
Turning radius \_\_\_\_\_ 93"  
*Basic aisle for right angle stacking (add load length) \_\_\_\_\_ 108¾"*  
*Underclearances*  
Upright \_\_\_\_\_ 3¼"  
Drive axle \_\_\_\_\_ 5½"  
Steer axle \_\_\_\_\_ 3¾"  
Center of frame \_\_\_\_\_ 5½"  
Counterweight \_\_\_\_\_ 4"

**SPEEDS AND GRADES** Travel speeds with rated load C 80 CF 80  
\_\_\_\_\_ 10.5 mph 10.7 mph  
Gradeability with rated load \_\_\_\_\_ 26.2% 24.3%  
*STANDARD HI-LO*  
*Loaded Empty Loaded Empty*  
Lift speed \_\_\_\_\_ 71 78 65 72  
Lowering speed \_\_\_\_\_ 60 80 60 65

**ENGINE** Industrial Continental Read Seal, 6 cylinder, L-head, equipped with stellite-faced valves; seats, positive valve rotators. Connecting rods, main bearings, cam shaft and timing gears are pressure lubricated by submerged gear type pump. Mechanical governor controls engine speed accurately without choking off power. Updraft carburetor.  
Model \_\_\_\_\_ F-209  
Bore \_\_\_\_\_ 3¼"  
Stroke \_\_\_\_\_ 4¾"  
Displacement — cubic inches \_\_\_\_\_ 209  
Crankcase capacity — quarts \_\_\_\_\_ 5  
Governed rpm with rated load \_\_\_\_\_ 2250  
Horsepower at governed rpm \_\_\_\_\_ 65  
Max. torque — lb. ft. \_\_\_\_\_ 157  
Fuel tank capacity — gals. \_\_\_\_\_ 12.5  
*Note: LP Gas adaptation optional at extra cost.*

**ENGINE FILTERS** Three types. (1) Fuel filter in metallic bowl. (2) One quart oil filter with automotive-type replaceable cartridge. (3) Dry type in-take air filter that uses a replaceable pleated paper cartridge with minute 5-micron openings.

**ELECTRICAL SYSTEM** 12-volt, 60 amp-hour battery, 25 amp. low cut-in generator charges at idle. Other features include enclosed electric starter motor with positive engagement and electrical cut-out; weather-shielded key starting switch; dust-proof distributor; electric horn. Multiple-disconnect plug to instrument panel simplifies servicing.

**INSTRUMENTS** Direct reading engine hour meter, ammeter, engine-oil pressure, fuel and temperature gauges, all mounted in cowl for easy reading.

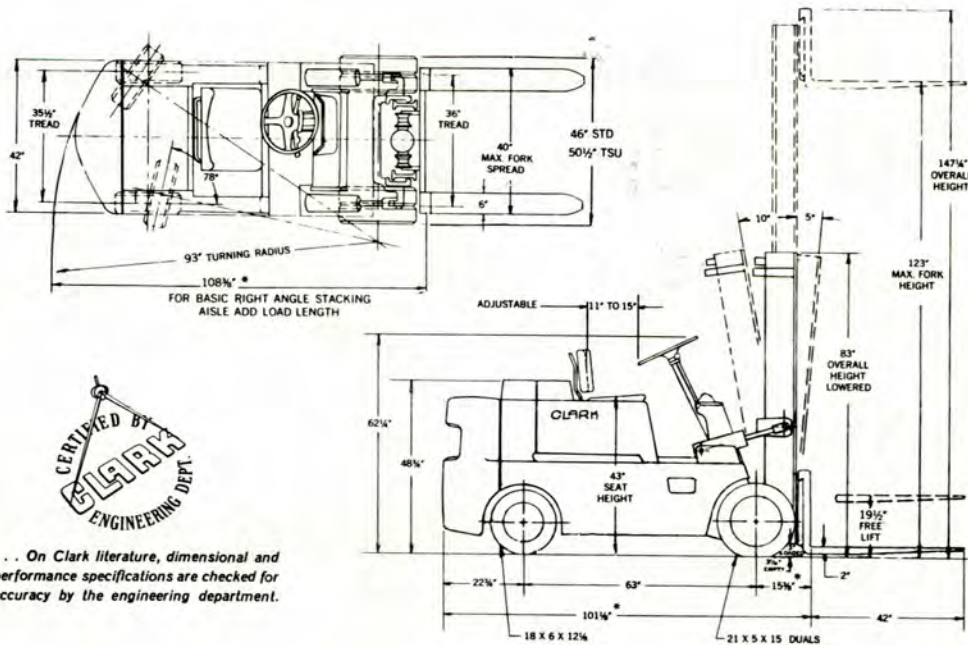
**DRIVE AXLE AND TRANSMISSION** Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full floating drive axle assembly. Axle housing, not drive shaft, carries weight of truck. Final gear reduction is made through fully enclosed pinion and ring gear at drive wheels.

**HYDRATORK® DRIVE, STANDARD** 2-speed power shifted transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled thru cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears and high and low range gears are in constant mesh. Direction selector lever for left-hand finger-tip control on steering column.

**HYDRAULIC INCHING** In close quarters the "free pedal" portion of either the left or right foot inching-brake pedal, hydraulically actuates inching valve permitting power to be gradually disengaged from drive wheels, even when engine is running at top speed for fast lifting.

**FRICTION CLUTCH TRANSMISSION, OPTIONAL** "Quick Change" 12" diameter single disc, dry plate clutch capacity of 300 lb. ft. of torque, controlled by low effort automotive type pedal. Two shift levers mounted on the steering column control the 3-speed synchronized transmission in either direction.

SPECIFICATIONS (CONTINUED)



... On Clark literature, dimensional and performance specifications are checked for accuracy by the engineering department.

\*ADD 1 1/2" FOR TRIPLE STAGE UPRIGHT

**BRAKES** (Two systems). Hydraulic spot disc brakes provide powerful braking without self-energization. Eliminates sudden "grabbing" of the brakes. Foot brake torque multiplied through final reduction at each drive wheel minimizes pedal effort. Brakes are enclosed within drive axle housing and require no adjustment for life of lining. Mechanical parking brake operates on transmission drive shaft.

**STEERING** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for floor level variations up to 3 1/2". Positive stops for lateral stability. Inclined king pins minimize road shocks. Recirculated ball type steering gear with 18" diameter handwheel. Tie rods are automotive type.

**UPRIGHT** Nested telescopic roller type. "I" beam inner section of SAE 1045 steel is nested within outer channel of SAE 1045 steel for greater safety and visibility. Side loading on upright rails is taken on upright rollers. Upright and carriage rollers are adjustable for wear to maintain new truck tolerances. Carriage also has 4 interior adjustable side thrust rollers to prevent binding. Carriage has additional lateral thrust rollers to prevent upright spread, insuring maximum free-rolling movement.

**LIFT AND TILT CYLINDERS** Tilt rods chrome plated. Externally removable shims compensate for wear on tilt cylinder gland packings. Tilt lock valves insure positive control — no upright drift. Both lift and tilt cylinders have metal rod wipers to keep foreign material from the packings. Free-floating mounting of piston type lift cylinder minimizes side strains. Modulated flow regulator in cylinder base reduces maximum lowering speed as weight of load increases.

**HYDRAULIC SYSTEM** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads. S.A.E. straight threads and O-ring seals used throughout pressure system. Vane-type pump is driven by hardened gears. Hydraulic sump, built into frame of 3/8" thick plate has 12 gal. capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filler cap breather, (2) a 25-micron full flow filter in sump.

**FORK CARRIAGE AND FORKS** All-welded construction, 1045 steel fork carriage to withstand impacts. Lateral fork adjustments from 0" to 40" with or without optional load rack. Convenient snap action latch assures positive fork positioning. Heat treated and upset forged forks to provide full section strength at heel.

**SEATING** Rubber mounted wide seat and back rest are Polyether, covered with vinyl plastic. Curved back rest tilts to provide additional driver comfort. An automotive type latch releases the seat for horizontal adjustment up to 4".

**MAINTENANCE** Split swing-out hood offers easy access for servicing. Check-points such as water and hydraulic sump filler caps, oil dip-stick and filter readily accessible. Battery swings out. Quick detachable counterweight is hook mounted, secured with one large bolt.

**GENERAL** Protectoseal gas tank filler cap. Auxiliary fuel supply — 1/2 gal. 12" height recessed pin-type coupler. Bolts and screws are zinc or cadmium plated. Multi-pass muffler. All exposed surfaces are shot-blasted and prime painted with weather resistant paint.

**DRIVER'S OVERHEAD GUARDS AND LOAD BACK RESTS** Driver's Overhead Guards and Load Back Rests are available as optional equipment. Clark Equipment Company recommends the use of these accessories and advises owner to consider his operation for their necessity.

**COLORS** Two tone. Silver gray, combined with one of five options: red, orange, yellow, green, or blue.



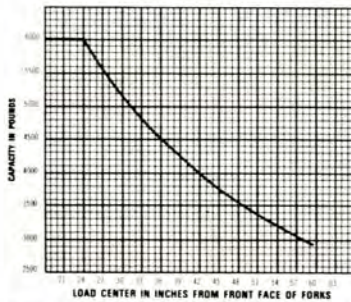
**CLARKLIFT®** **CY-60** **DIMENSIONAL SPECIFICATIONS**  
**CFY-60**

**UPRIGHT DIMENSIONAL TABLE**

Std. Hi-Lo	TSU	Over-all Height		Free Lift	
		Lowered	Std.	Hi-Lo	TSU
75	—	60½	19½	37¼	—
81	—	63½	19½	40¼	—
87	—	66½	19½	43¼	—
93	126	69½	19½	46¼	17½
* 99	135	72½	19½	49¼	17½
105	*144	75½	19½	52¼	17½
111	153	78½	19½	55¼	17½
117	162	81½	19½	58¼	17½
*123	171	84½	19½	61¼	17½
129	*180	87½	19½	64¼	17½
135	189	90½	19½	67¼	15½
141	198	** 93½	19½	70¼	17½
*147	207	** 96½	17½	73¼	15½
153	*216	**100½	19½	77¼	17½
159	225	**103½	19½	80¼	15½
165	234	**107½	19½	84¼	17½
*171	243	**110½	19½	87¼	15½
177	—	113½	17½	90¼	17½
183	—	117½	19½	94¼	17½
189	—	120½	19½	97¼	17½
195	—	124½	19½	101¼	17½
201	—	127½	19½	104¼	17½

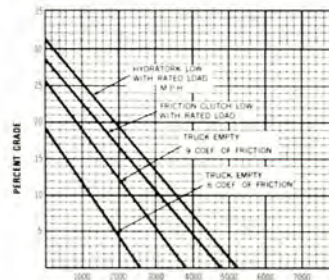
\*Preferred standard heights.  
\*\*Add 1" for triple stage upright.  
For overall height raised add 24¼" to maximum fork height.

**CAPACITY CHART**



RATED CAPACITIES SHOWN ABOVE ARE COMPUTED WITH UPRIGHTS IN VERTICAL POSITION THEY APPLY ONLY ON MAXIMUM FORK HEIGHTS UP TO AND INCLUDING 154"

**GRADE & DRAWBAR PULL CHART**



AVAILABLE DRAWBAR PULL IN POUNDS WITH TOWING COUPLER 12" FROM FLOOR  
EMPTY TRUCK GRADES ARE WITH EITHER TRANSMISSION

**ENGINEERING SPECIFICATIONS**

**MODEL** C(F)Y 60 Weight ..... 10,375 lbs. standard

**WEIGHT DISTRIBUTION AND CAPACITY** Percent on drive wheels, truck empty: 48%  
Rated capacity ..... 6,000 lbs. at 24" load center  
Alternate ratings ..... 4,550 lbs. at 36" load center  
..... 3,610 lbs. at 48" load center  
(See capacity chart for other ratings)

**TIRES** *Standard Tires* Ply Air Press.  
Single Drive ..... 8.25 x 15 12 100 lbs.  
Steer ..... 7.00 x 12 12 100 lbs.  
*Optional Tires*  
Dual Drive ..... 7.50 x 15 10 95 lbs.

**DIMENSIONS AND UNDERCLEARANCES** *Dimensions* Basic aisle for right angle stacking (add load length) 119"  
Length (to face of forks) ..... 108"  
Wheelbase ..... 69"  
*Underclearances*  
Upright ..... 6"  
Drive axle ..... 9"  
Steer axle ..... 8¼"  
Center of frame ..... 11"  
Counterweight ..... 8¼"

**SPEEDS AND GRADES** Travel speeds *Loaded Empty*  
C(F)Y ..... 12.5 mph 13.8 mph  
Gradeability with rated load 31% 28%

	STANDARD		HI-LO	
	Loaded	Empty	Loaded	Empty
Lift speed	71	78	65	72
Lowering speed	60	80	60	65

**ENGINE** Industrial Continental Red Seal, 6 cylinder, L-head, equipped with stellite-faced valves; seats, positive valve rotators. Connecting rods, main bearings, cam shaft and timing gears are pressure lubricated by submerged gear type pump. Mechanical governor controls engine speed accurately without choking off power. Updraft carburetor.  
Model ..... F-244  
Bore ..... 37/16"  
Stroke ..... 43/8"  
Displacement — cubic inches ..... 244  
Crankcase capacity — quarts ..... 5  
Governed rpm with rated load ..... 2250  
Horsepower at governed rpm ..... 69  
Max. torque — lb. ft. .... 192  
Fuel tank capacity — gals. .... 15  
Note: LP Gas adaptation optional at extra cost.

**ENGINE FILTERS** Three types. (1) Fuel filter in metallic bowl. (2) One quart oil filter with automotive-type replaceable cartridge. (3) Dry type in-take air filter that uses a replaceable pleated paper cartridge with minute 5-micron openings.

**ELECTRICAL SYSTEM** 12-volt, 60 amp-hour battery. 25 amp. low cut-in generator charges at idle. Other features include enclosed electric starter motor with positive engagement and electrical cut-out; weather-shielded key starting switch; dust-proof distributor; electric horn. Multiple-disconnect plug to instrument panel simplifies servicing.

**INSTRUMENTS** Direct reading engine hour meter, mounted above gas fill compartment. Ammeter, engine-oil pressure light, fuel and temperature gauges, all mounted in cowl for easy reading.

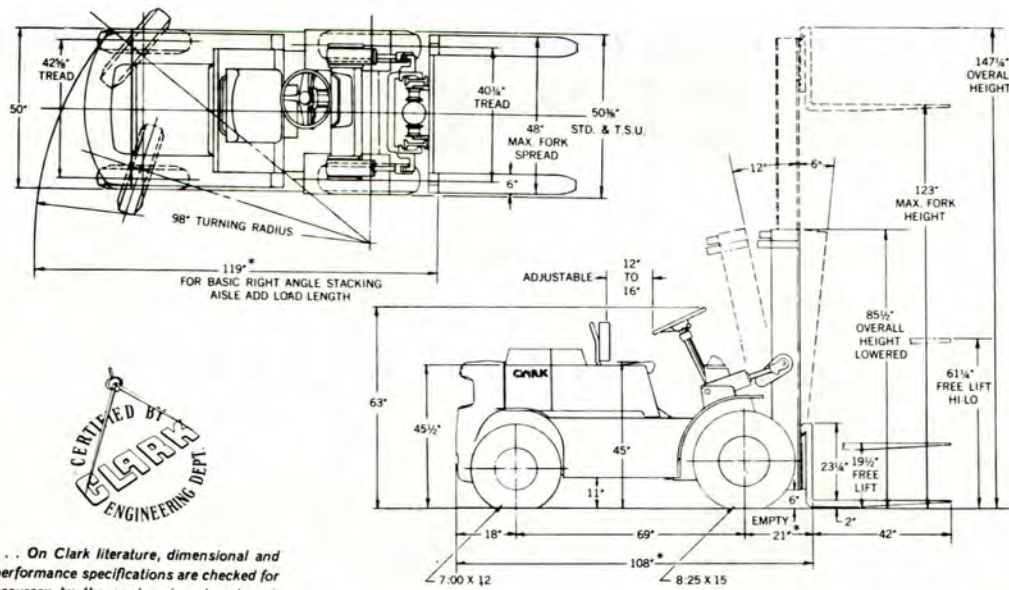
**DRIVE AXLE AND TRANSMISSION** Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full floating drive axle assembly. Axle housing carries weight of truck not drive shaft. Final gear reduction is made through fully enclosed pinion and ring gear at drive wheels.

**HYDRATORK® DRIVE, STANDARD** 2-speed power shifted transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled thru cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears and high and low range gears are in constant mesh. Direction selector lever for left-hand finger-tip control on steering column.

**HYDRAULIC INCHING** In close quarters the "free pedal" portion of either the left or right foot inching-brake pedal, hydraulically actuates inching valve permitting power to be gradually disengaged from drive wheels, even when engine is running at top speed for fast lifting.

**FRICTION CLUTCH TRANSMISSION, OPTIONAL** "Quick Change" 12" diameter single disc, dry plate clutch capacity of 330 lb. ft. of torque, controlled by automotive type pedal with over-center spring assist to reduce foot effort required. Two shift levers mounted on the steering column control the 3-speed synchronized transmission in either direction.

SPECIFICATIONS (CONTINUED)



... On Clark literature, dimensional and performance specifications are checked for accuracy by the engineering department.

\* ADD 1 1/2" FOR TRIPLE STAGE UPRIGHT

**BRAKES** (Two systems). Hydraulic spot disc brakes provide powerful braking without self-energization. Eliminates sudden "grabbing" of the brakes. Foot brake torque multiplied through final reduction at each drive wheel minimizes pedal effort. Brakes are enclosed within drive axle housing and require no adjustment for life of lining. Mechanical parking brake operates on transmission drive shaft.

**STEERING** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for ground level variations up to 6". Positive stops for lateral stability. Inclined king pins minimize road shocks. Recirculated ball type steering gear with 18" diameter handwheel. Tie rods are automotive type.

**UPRIGHT** Nested telescopic roller type. "I" beam inner section of SAE 1045 steel is nested within outer channel of SAE 1045 steel for greater safety and visibility. Side loading on upright rails is taken on upright rollers. Upright and carriage rollers are adjustable for wear to maintain new truck tolerances. Carriage also has 4 interior adjustable side thrust rollers to prevent binding. Carriage has additional lateral thrust rollers to prevent upright spread, insuring maximum free-rolling movement.

**LIFT AND TILT CYLINDERS** Tilt rods chrome plated. Externally removable shims compensate for wear on tilt cylinder gland packings. Tilt lock valves insure positive control — no upright drift. Both lift and tilt cylinders have metal rod wipers to keep foreign material from the packings. Free-floating mounting of piston type lift cylinder minimizes side strains. Modulated flow regulator in cylinder base reduces maximum lowering speed as weight of load increases.

**HYDRAULIC SYSTEM** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads; will open fully within 100 p.s.i. of cracking pressure. SAE straight threads and O-ring seals used throughout pressure system. Vane-type pump is driven by hardened gears. Hydraulic sump, built into frame of 3/8" thick plate has 12.5 gal. capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filler cap breather, (2) a 25-micron full flow filter in sump.

**FORK CARRIAGE AND FORKS** All-welded construction, 1045 steel fork carriage to withstand impacts. Lateral fork adjustments from 0" to 48" with or without optional load rack. Convenient snap action latch assures positive fork positioning. Heat treated and upset forged forks to provide full section strength at heel.

**SEATING** Rubber mounted extra wide seat and back rest are Polyether, covered with vinyl plastic. Curved back rest tilts to provide additional driver comfort. An automotive type latch releases the seat for horizontal adjustment up to 4".

**MAINTENANCE** Split swing-out hood offers easy access for servicing. Check-points such as water and hydraulic sump filler caps, oil dip-stick and filler readily accessible. Battery swings out. Quickly detachable counterweight is hook mounted, secured with one large bolt.

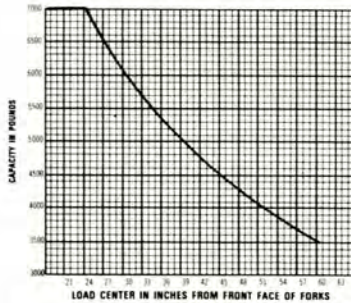
**GENERAL** Protectoseal gas tank filler cap. 12" height recessed pin-type coupler. Bolts and screws are zinc or cadmium plated. Multi-pass muffler. All exposed surfaces are shot-blasted and prime painted with weather resistant paint.

**DRIVER'S OVERHEAD GUARDS AND LOAD BACK RESTS** Driver's Overhead Guards and Load Back Rests are available as optional equipment. Clark Equipment Company recommends the use of these accessories and advises owner to consider his operation for their necessity.

**COLORS** Two tone. Silver gray, combined with one of five options: red, orange, yellow, green, or blue.

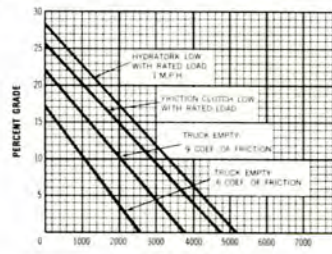
**CLARKLIFT®  
CY-70 DIMENSIONAL SPECIFICATIONS  
CFY-70**

**CAPACITY CHART**



RATED CAPACITIES SHOWN ABOVE ARE COMPUTED WITH UPRIGHTS IN VERTICAL POSITION. THEY APPLY ONLY ON MAXIMUM FORK HEIGHTS UP TO AND INCLUDING 154"

**GRADE & DRAWBAR PULL CHART**



AVAILABLE DRAWBAR PULL IN POUNDS WITH TOWING COUPLER 1" FROM FLOOR. EMPTY TRUCK GRADES ARE WITH EITHER TRANSMISSION.

**UPRIGHT DIMENSIONAL TABLE**

Std. Hi-Lo	TSU	Over-all Height		Free Lift		
		Lowered	Std.	Hi-Lo	TSU	
75	—	60½	19½	37½	—	—
81	—	63½	19½	40¼	—	—
87	—	66½	19½	43¼	—	—
93	126	69½	19½	46¼	17½	—
* 99	135	72½	19½	49¼	17½	—
105	*144	75½	19½	52¼	17½	—
111	153	78½	19½	55¼	17½	—
117	162	81½	19½	58¼	17½	—
*123	171	84½	19½	61¼	17½	—
129	*180	87½	19½	64¼	17½	—
135	189	90½	19½	67¼	15½	—
141	198	** 93½	19½	70¼	17½	—
*147	207	** 96½	17½	73¼	15½	—
153	*216	**100½	19½	77¼	17½	—
159	225	**103½	19½	80¼	15½	—
165	234	**107½	19½	84¼	17½	—
*171	243	**110½	19½	87¼	15½	—
177	—	113½	17½	90¼	17½	—
183	—	117½	19½	94¼	17½	—
189	—	120½	19½	97¼	17½	—
195	—	124½	19½	101¼	17½	—
201	—	127½	19½	104¼	17½	—

\*Preferred standard heights.

\*\*Add 1" for triple stage upright.

For overall height raised add 24¼" to maximum fork height.

**ENGINEERING SPECIFICATIONS**

**MODEL** C(F)Y 70 Weight 11,315 lbs. standard

**WEIGHT DISTRIBUTION AND CAPACITY**  
 Percent on drive wheels, truck empty: 44%  
 Rated capacity 7,000 lbs. at 24" load center  
 Alternate ratings 5,320 lbs. at 36" load center  
 4,220 lbs. at 48" load center  
 (See capacity chart for other ratings)

**TIRES**  
*Standard Tires*  
 Single Drive 8.25 x 15 12 100 lbs.  
 Steer 7.00 x 12 12 100 lbs.  
*Optional Tires*  
 Dual Drive 7.50 x 15 10 95 lbs.

**DIMENSIONS AND UNDERCLEARANCES**  
 Dimensions  
 Length (to face of forks) 110"  
 Wheelbase 69"  
 Width (single drive tires) 50¾"  
 Tread (drive) 40¾"  
 Tread (steer) 42¾"  
 Turning radius 100"  
 Basic aisle for right angle stacking (add load length) 121"  
 Underclearances  
 Upright 6"  
 Drive axle 9"  
 Steer axle 8¼"  
 Center of frame 11"  
 Counterweight 8¼"

**SPEEDS AND GRADES**  
 Travel speeds  
 C(F)Y Loaded Empty  
 12.4 mph 13.3 mph  
 Gradeability with rated load 28% 25%  
 Lift speed  
 Lowering speed

	STANDARD		HI-LO	
	Loaded	Empty	Loaded	Empty
Lift speed	71	78	65	72
Lowering speed	60	80	60	65

**ENGINE** Industrial Continental Red Seal, 6 cylinder, L-head, equipped with stellite-faced valves; seats, positive valve rotators. Connecting rods, main bearings, cam shaft and timing gears are pressure lubricated by submerged gear type pump. Mechanical governor controls engine speed accurately without choking off power. Updraft carburetor.  
 Model F-244  
 Bore 3⅞"  
 Stroke 4⅜"  
 Displacement — cubic inches 244  
 Crankcase capacity — quarts 5  
 Governed rpm with rated load 2250  
 Horsepower at governed rpm 69  
 Max. torque — lb. ft. 192  
 Fuel tank capacity — gals. 15  
 Note: LP Gas adaptation optional at extra cost.

**ENGINE FILTERS** Three types. (1) Fuel filter in metallic bowl. (2) One quart oil filter with automotive-type replaceable cartridge. (3) Dry type in-take air filter that uses a replaceable pleated paper cartridge with minute 5-micron openings.

**ELECTRICAL SYSTEM** 12-volt, 60 amp-hour battery. 25 amp. low cut-in generator charges at idle. Other features include enclosed electric starter motor with positive engagement and electrical cut-out; weather-shielded key starting switch; dust-proof distributor; electric horn. Multiple-disconnect plug to instrument panel simplifies servicing.

**INSTRUMENTS** Direct reading engine hour meter, mounted above gas fill compartment. Ammeter, engine-oil pressure light, fuel and temperature gauges, all mounted in cowl for easy reading.

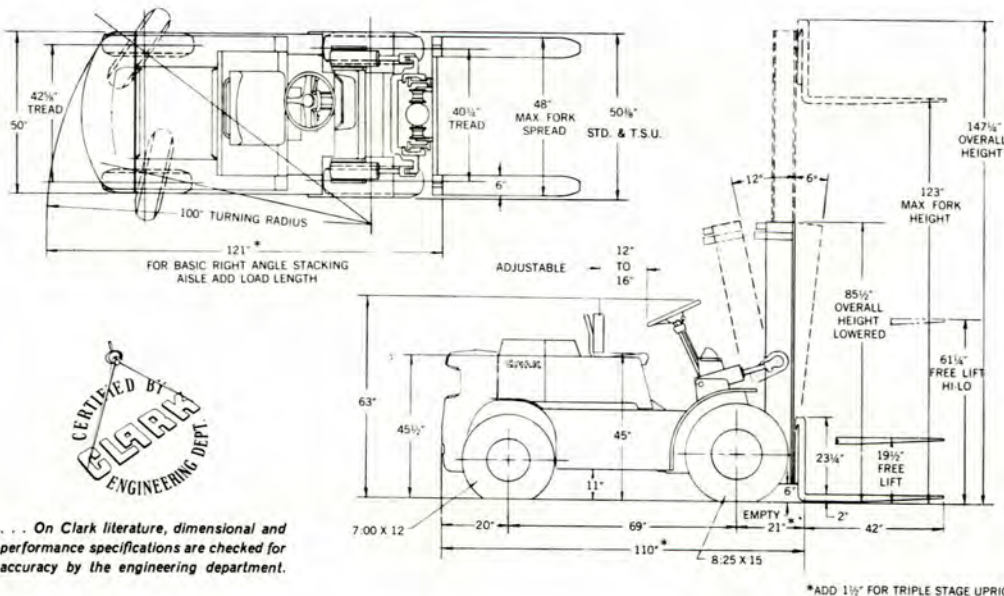
**DRIVE AXLE AND TRANSMISSION** Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full floating drive axle assembly. Axle housing carries weight of truck not drive shaft. Final gear reduction is made through fully enclosed pinion and ring gear at drive wheels.

**HYDRATOR® DRIVE, STANDARD** 2-speed power shifted transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled thru cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears and high and low range gears are in constant mesh. Direction selector lever for left-hand finger-tip control on steering column.

**HYDRAULIC INCHING** In close quarters the "free pedal" portion of either the left or right foot inching-brake pedal, hydraulically actuates inching valve permitting power to be gradually disengaged from drive wheels, even when engine is running at top speed for fast lifting.

**FRICITION CLUTCH TRANSMISSION, OPTIONAL** "Quick Change" 12" diameter single disc, dry plate clutch capacity of 330 lb. ft. of torque, controlled by automotive type pedal with over-center spring assist to reduce foot effort required. Two shift levers mounted on the steering column control the 3-speed synchronized transmission in either direction.

SPECIFICATIONS (CONTINUED)



... On Clark literature, dimensional and performance specifications are checked for accuracy by the engineering department.

**BRAKES** (Two systems). Hydraulic spot disc brakes provide powerful braking without self-energization. Eliminates sudden "grabbing" of the brakes. Foot brake torque multiplied through final reduction at each drive wheel minimizes pedal effort. Brakes are enclosed within drive axle housing and require no adjustment for life of lining. Mechanical parking brake operates on transmission drive shaft.

**STEERING** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for ground level variations up to 6". Positive stops for lateral stability. Inclined king pins minimize road shocks. Recirculated ball type steering gear with 18" diameter handwheel. Tie rods are automotive type.

**UPRIGHT** Nested telescopic roller type. "I" beam inner section of SAE 1045 steel is nested within outer channel of SAE 1045 steel for greater safety and visibility. Side loading on upright rails is taken on upright rollers. Upright and carriage rollers are adjustable for wear to maintain new truck tolerances. Carriage also has 4 interior adjustable side thrust rollers to prevent binding. Carriage has additional lateral thrust rollers to prevent upright spread, insuring maximum free-rolling movement.

**LIFT AND TILT CYLINDERS** Tilt rods chrome plated. Externally removable shims compensate for wear on tilt cylinder gland packings. Tilt lock valves insures positive control — no upright drift. Both lift and tilt cylinders have metal rod wipers to keep foreign material from the packings. Free-floating mounting of piston type lift cylinder minimizes side strains. Modulated flow regulator in cylinder base reduces maximum lowering speed as weight of load increases.

**HYDRAULIC SYSTEM** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads; will open fully within 100 p.s.i. of cracking pressure. SAE straight threads and O-ring seals used throughout pressure system. Vane-type pump is driven by hardened gears. Hydraulic sump, built into frame of 3/8" thick plate has 12.5 gal. capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filler cap breather, (2) a 25-micron full flow filter in sump.

**FORK CARRIAGE AND FORKS** All-welded construction, 1045 steel fork carriage to withstand impacts. Lateral fork adjustments from 0" to 48" with or without optional load rack. Convenient snap action latch assures positive fork positioning. Heat treated and upset forged forks to provide full section strength at heel.

**SEATING** Rubber mounted extra wide seat and back rest are Polyether, covered with vinyl plastic. Curved back rest tilts to provide additional driver comfort. An automotive type latch releases the seat for horizontal adjustment up to 4".

**MAINTENANCE** Split swing-out hood offers easy access for servicing. Check-points such as water and hydraulic sump filler caps, oil dip-stick and filler readily accessible. Battery swings out. Quickly detachable counterweight is hook mounted, secured with one large bolt.

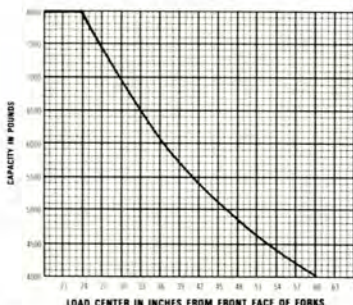
**GENERAL** Protectoseal gas tank filler cap. 12" height recessed pin-type coupler. Bolts and screws are zinc or cadmium plated. Multi-pass muffler. All exposed surfaces are shot-blasted and prime painted with weather resistant paint.

**DRIVER'S OVERHEAD GUARDS AND LOAD BACK RESTS** Driver's Overhead Guards and Load Back Rests are available as optional equipment. Clark Equipment Company recommends the use of these accessories and advises owner to consider his operation for their necessity.

**COLORS** Two tone. Silver gray, combined with one of five options: red, orange, yellow, green, or blue.

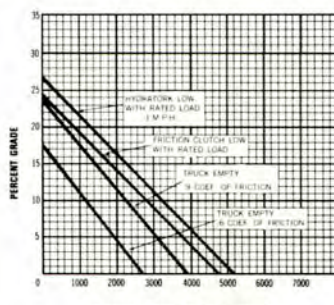
**CLARKLIFT®  
CY-80      DIMENSIONAL SPECIFICATIONS  
CFY-80**

**CAPACITY CHART**



RATED CAPACITIES SHOWN ABOVE ARE COMPUTED WITH UPRIGHTS IN VERTICAL POSITION. THEY APPLY ONLY ON MAXIMUM FORK HEIGHTS UP TO AND INCLUDING 154"

**GRADE & DRAWBAR PULL CHART**



AVAILABLE DRAWBAR PULL IN POUNDS WITH TOWING COUPLER 1" FROM FLOOR. EMPTY TRUCK GRADES ARE WITH EITHER TRANSMISSION.

**UPRIGHT DIMENSIONAL TABLE**

Max. Fork Ht.	Over-all		Free Lift			
	Std. Hi-Lo	TSU	Lowered	Std.	Hi-Lo	TSU
75	—	60½	19½	37¼	—	—
81	—	63½	19½	40¼	—	—
87	—	66½	19½	43¼	—	—
93	126	69½	19½	46¼	17½	—
* 99	135	72½	19½	49¼	17½	—
105	*144	75½	19½	52¼	17½	—
111	153	78½	19½	55¼	17½	—
117	162	81½	19½	58¼	17½	—
*123	171	84½	19½	61¼	17½	—
129	*180	87½	19½	64¼	17½	—
135	189	90½	19½	67¼	15½	—
141	198	** 93½	19½	70¼	17½	—
*147	207	** 96½	17½	73¼	15½	—
153	*216	**100½	19½	77¼	17½	—
159	225	**103½	19½	80¼	15½	—
165	234	**107½	19½	84¼	17½	—
*171	243	**110½	19½	87¼	15½	—
177	—	113½	17½	90¼	17½	—
183	—	117½	19½	94¼	17½	—
189	—	120½	19½	97¼	17½	—
195	—	124½	19½	101¼	17½	—
201	—	127½	19½	104¼	17½	—

\*Preferred standard heights.

\*\*Add 1" for triple stage upright.

For overall height raised add 24¼" to maximum fork height.

**ENGINEERING SPECIFICATIONS**

**MODEL** C(F)Y 80 Weight 11,725 lbs. standard

**WEIGHT DISTRIBUTION AND CAPACITY** Percent on drive wheels, truck empty: 45%  
Rated capacity — 8,000 lbs. at 24" load center  
Alternate ratings — 6,110 lbs. at 36" load center  
4,875 lbs. at 48" load center  
(See capacity chart for other ratings)

**TIRES** *Standard Tires* Ply Air Press.  
Single Drive 8.25 x 15 12 100 lbs.  
Steer 7.00 x 12 12 100 lbs.  
*Optional Tires*  
Dual Drive 7.50 x 15 10 95 lbs.

**DIMENSIONS AND UNDERCLEARANCES** *Dimensions* Basic aisle for right angle stacking (add load length) 129"  
Length (to face of forks) 118"  
Wheelbase 77"  
Width (single drive tires) 50¾"  
Tread (drive) 40¾"  
Tread (steer) 42¾"  
Turning radius 108"  
*Underclearances*  
Upright 6"  
Drive axle 9"  
Steer axle 8¼"  
Center of frame 11"  
Counterweight 8¼"

**SPEEDS AND GRADES** Travel speeds *Loaded Empty*  
C(F)Y 12.1 mph 13.3 mph  
Gradeability with rated load 26% 24%  
*STANDARD HI-LO*  
*Loaded Empty Loaded Empty*  
Lift speed 71 78 65 72  
Lowering speed 60 80 60 65

**ENGINE** Industrial Continental Red Seal, 6 cylinder, L-head, equipped with stellite-faced valves; seats, positive valve rotators. Connecting rods, main bearings, cam shaft and timing gears are pressure lubricated by submerged gear type pump. Mechanical governor controls engine speed accurately without choking off power. Updraft carburetor.  
Model F-244  
Bore 3¾"  
Stroke 4¾"  
Displacement — cubic inches 244  
Crankcase capacity — quarts 5  
Governed rpm with rated load 2250  
Horsepower at governed rpm 69  
Max. torque — lb. ft. 192  
Fuel tank capacity — gals. 15  
Note: LP Gas adaptation optional at extra cost.

**ENGINE FILTERS** Three types. (1) Fuel filter in metallic bowl. (2) One quart oil filter with automotive-type replaceable cartridge. (3) Dry type in-take air filter that uses a replaceable pleated paper cartridge with minute 5-micron openings.

**ELECTRICAL SYSTEM** 12-volt, 60 amp-hour battery, 25 amp. low cut-in generator charges at idle. Other features include enclosed electric starter motor with positive engagement and electrical cut-out; weather-shielded key starting switch; dust-proof distributor; electric horn. Multiple-disconnect plug to instrument panel simplifies servicing.

**INSTRUMENTS** Direct reading engine hour meter, mounted above gas fill compartment. Ammeter, engine-oil pressure light, fuel and temperature gauges, all mounted in cowl for easy reading.

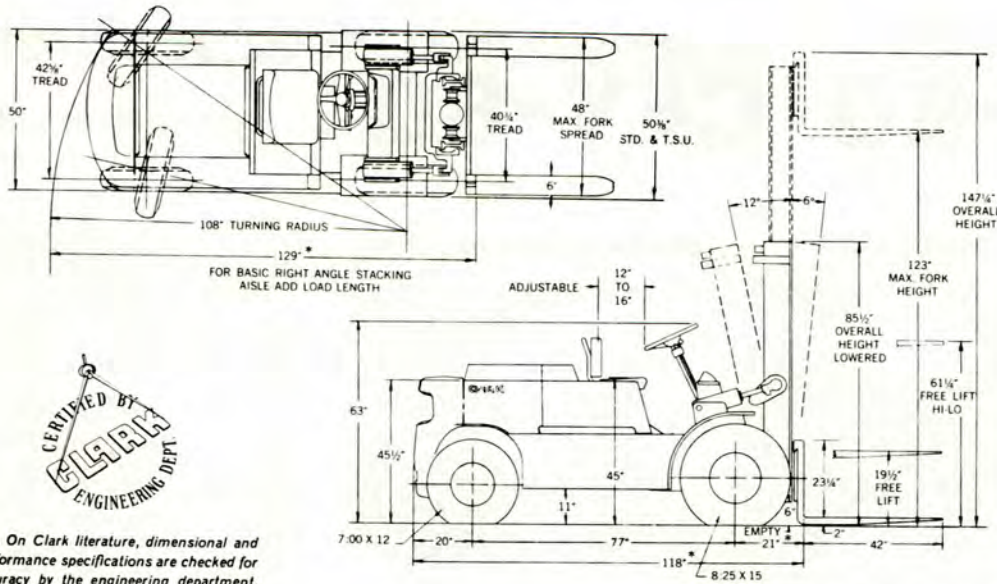
**DRIVE AXLE AND TRANSMISSION** Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full floating drive axle assembly. Axle housing carries weight of truck not drive shaft. Final gear reduction is made through fully enclosed pinion and ring gear at drive wheels.

**HYDRATORK® DRIVE, STANDARD** 2-speed power shifted transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled thru cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears and high and low range gears are in constant mesh. Direction selector lever for left-hand finger-tip control on steering column.

**HYDRAULIC INCHING** In close quarters the "free pedal" portion of either the left or right foot inching-brake pedal, hydraulically actuates inching valve permitting power to be gradually disengaged from drive wheels, even when engine is running at top speed for fast lifting.

**FRICTION CLUTCH TRANSMISSION, OPTIONAL** "Quick Change" 12" diameter single disc, dry plate clutch capacity of 330 lb. ft. of torque, controlled by automotive type pedal with over-center spring assist to reduce foot effort required. Two shift levers mounted on the steering column control the 3-speed synchronized transmission in either direction.

SPECIFICATIONS (CONTINUED)



... On Clark literature, dimensional and performance specifications are checked for accuracy by the engineering department.

\*ADD 1 1/2" FOR TRIPLE STAGE UPRIGHT

**BRAKES** (Two systems). Hydraulic spot disc brakes provide powerful braking without self-energization. Eliminates sudden "grabbing" of the brakes. Foot brake torque multiplied through final reduction at each drive wheel minimizes pedal effort. Brakes are enclosed within drive axle housing and require no adjustment for life of lining. Mechanical parking brake operates on transmission drive shaft.

**STEERING** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for ground level variations up to 6". Positive stops for lateral stability. Inclined king pins minimize road shocks. Recirculated ball type steering gear with 18" diameter handwheel. Tie rods are automotive type.

**UPRIGHT** Nested telescopic roller type. "I" beam inner section of SAE 1045 steel is nested within outer channel of SAE 1045 steel for greater safety and visibility. Side loading on upright rails is taken on upright rollers. Upright and carriage rollers are adjustable for wear to maintain new truck tolerances. Carriage also has 4 interior adjustable side thrust rollers to prevent binding. Carriage has additional lateral thrust rollers to prevent upright spread, insuring maximum free-rolling movement.

**LIFT AND TILT CYLINDERS** Tilt rods chrome plated. Externally removable shims compensate for wear on tilt cylinder gland packings. Tilt lock valves insure positive control — no upright drift. Both lift and tilt cylinders have metal rod wipers to keep foreign material from the packings. Free-floating mounting of piston type lift cylinder minimizes side strains. Modulated flow regulator in cylinder base reduces maximum lowering speed as weight of load increases.

**HYDRAULIC SYSTEM** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads; will open fully within 100 p.s.i. of cracking pressure. SAE straight threads and O-ring seals used throughout pressure system. Vane-type pump is driven by hardened gears. Hydraulic sump, built into frame of 3/8" thick plate has 12.5 gal. capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filler cap breather, (2) a 25-micron full flow filter in sump.

**FORK CARRIAGE AND FORKS** All-welded construction, 1045 steel fork carriage to withstand impacts. Lateral fork adjustments from 0" to 48" with or without optional load rack. Convenient snap action latch assures positive fork positioning. Heat treated and upset forged forks to provide full section strength at heel.

**SEATING** Rubber mounted extra wide seat and back rest are Polyether, covered with vinyl plastic. Curved back rest tilts to provide additional driver comfort. An automotive type latch releases the seat for horizontal adjustment up to 4".

**MAINTENANCE** Split swing-out hood offers easy access for servicing. Check-points such as water and hydraulic sump filler caps, oil dip-stick and filter readily accessible. Battery swings out. Quickly detachable counterweight is hook mounted, secured with one large bolt.

**GENERAL** Protectoseal gas tank filler cap. 12" height recessed pin-type coupler. Bolts and screws are zinc or cadmium plated. Multi-pass muffler. All exposed surfaces are shot-blasted and prime painted with weather resistant paint.

**DRIVER'S OVERHEAD GUARDS AND LOAD BACK RESTS** Driver's Overhead Guards and Load Back Rests are available as optional equipment. Clark Equipment Company recommends the use of these accessories and advises owner to consider his operation for their necessity.

**COLORS** Two tone. Silver gray, combined with one of five options: red, orange, yellow, green, or blue.

**E**NGINEERING  
**S**PECIFICATIONS

**CLARKLIFT® C 60D**

6,000 pounds capacity, 24 inch load center

STANDARD HI-LO TSU

MODEL C(F) 60D Service Weight 10,210 lbs. 10,260 lbs. 10,880 lbs.  
Percent on drive wheels, truck empty: 42 %

**INSURANCE CLASSIFICATIONS.** The C (F) 60D has as standard equipment those additional safe-guards to the exhaust, fuel, and electrical systems that are required by U.L. for trucks designated DS. At this time approval by Underwriter's Laboratories is pending.

**DIMENSIONS**

Length (to front face of forks) _____	95 5/8"	Tread, drive _____	35"
Wheelbase _____	58"	Tread, steer _____	35 1/2"
Width, standard _____	44"	Turning radius _____	87 3/8"
		Basic aisle for right angle stacking (add load length) _____	102 3/4"

**UNDERCLEARANCES**

Upright _____	3 1/16"	Center of frame _____	5 1/8"
Drive axle _____	5 1/8"	Counterweight _____	CF 60D 4"
Steer axle _____	3 3/4"		

**SPEEDS AND GRADES**

	C 60 D	
Travel speeds with rated load _____	9.7 M P H ( 853 F P M )	9.1 M P H ( 800 F P M )
Gradeability with rated load _____	28 %	23 %

	STANDARD	HI-LO	TSU
	Loaded Empty	Loaded Empty	Loaded Empty
Lifting speed (FPM) _____	76 90	72 86	71 85
Lowering speed " _____	60 80	60 65	60 80

**DIESEL ENGINE.** General Motors 2 cylinder, 2 cycle, 2 valve. Rotor-type pump crankshaft driven. Quickly replaceable, cam-operated unit fuel injectors pressurize fuel at injector tip, eliminating high pressure fuel lines. Optional equipment includes push button cold weather priming system, controlled from within the operator compartment. System injects additives into engine air-intake for easier cold weather starting.

Model _____	2-53	Governed RPM with _____	no load _____	2150
Bore _____	3 7/8"	SAE rated horsepower at _____	2150 RPM _____	47
Stroke _____	4 1/2"	Max. SAE rated torque, _____	lb. ft. at 1200 RPM _____	114
Displacement _____	106.1 cu. in.	Fuel tank capacity, gals. _____		11
Crankcase capacity _____	8 qts.			

**ENGINE FILTERS.** Three types: (1) Duo-fuel filter. (2) One quart oil filter with automotive-type replaceable cartridge. (3) Two-stage dry type in-take air filter with pre-cleaner that uses a washable replaceable pleated paper cartridge.

**ELECTRICAL SYSTEM.** 12-volt, 130 amp-hour battery; 14 amp enclosed generator. Enclosed electric starter motor has positive engagement, electrical cut-out. Weather-shielded key starting switch; electric horn; and multiple disconnect plug to instrument panel. Lights optional at extra cost.

**INSTRUMENTS.** Direct reading engine hour meter; ammeter, engine oil pressure, fuel, and temperature gauges, all mounted in cowl for easy reading.

**AXLE AND FINAL DRIVE.** Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full-floating drive axle assembly. Axle housing, not drive shaft, carries weight of truck. Final gear reduction is made through fully enclosed pinion and ring gear at drive wheels.

**HYDRATORK® TRANSMISSION.** Standard equipment on the C 60. Two-speed power shifted transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled through cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears, high and low range gears, are in constant mesh, and are full power shifted. Direction selection and range shift lever, for left-hand finger-tip control on steering column.

**HYDRAULIC INCHING.** In close quarters the "free-pedal" portion of either the left or the right inching-brake pedal, hydraulically actuates inching valve, permitting power to be gradually disengaged from the drive wheels, even when the engine is running at top speed for fast lifting.

**FRICTION CLUTCH TRANSMISSION.** Standard equipment on the CF 60. "Quick change" 12" diameter single disc, dry plate clutch capacity of 300 lb. ft. of torque, controlled by low effort automotive type pedal. Two shift levers mounted on the steering column control the 3-speed transmission synchronized between 2nd and 3rd, and between forward and reverse.

**BRAKES.** Two systems. Hydraulic spot disc brakes provide powerful braking without sudden grabbing. Brakes are self-adjusting, and require no periodic maintenance for the life of the lining. Foot brake torque is multiplied through final reduction at each drive wheel to maximize braking, minimize pedal effort. Brakes are enclosed within drive axle housing. Mechanical parking brake operates on transmission drive shaft.

**STEERING.** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for floor level variations up to 3 1/2". Positive stops for lateral stability. Inclined king pins minimize road shocks. Recirculated ball type steering gear with 18" diameter handwheel. Tie rods are automotive type.

**HYDRAULIC SYSTEM.** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads. Vane-type pump is driven directly by crankshaft. Hydraulic sump, built into frame of 3/8" thick plate has 9 gallon capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filler cap breather, (2) a 25-micron full flow filter in sump.

**SEATING.** Rubber mounted wide seat and back rest are Polyurethane foam, covered with vinyl plastic. Backrest is contoured, and center pivoted to fit position of driver, reducing driver fatigue. Automotive-type latch releases the seat for horizontal adjustment up to 4".

**MAINTENANCE.** Split swing-out hood offers easy access for servicing. Check points such as water and hydraulic sump filler caps, oil dipstick and filler readily accessible. Batteries swing out. Quickly detachable counterweight is hook mounted, secured with one large bolt.

**OVERHEAD GUARD AND LOAD BACK REST.** Driver's overhead guard and 48" high load back rest are standard equipment.

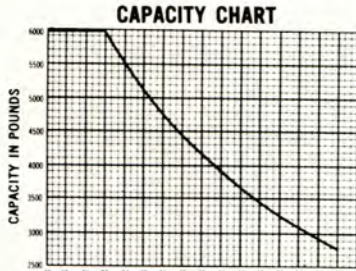
**ADDED ADVANTAGES.** Protectoseal gas tank filler cap; auxiliary fuel supply of 1/2 gallon; recessed pin-type coupler at 12"; multi-pass muffler; bolts and screws are zinc or cadmium plated; all exposed surfaces are shot-blasted and prime painted with weather resistant paint.

**COLORS.** Standard delivery color is two-tone silver-grey and yellow; optional colors with grey are red, orange, green and blue.

**DIMENSIONAL SPECIFICATIONS**

**CLARKLIFT® C 60D**

6,000 pounds capacity, 24 inch load center



**LOAD CENTER IN INCHES FROM FRONT FACE OF FORKS**—RATED CAPACITIES SHOWN ABOVE ARE COMPUTED WITH UPRIGHTS IN VERTICAL POSITION. THEY APPLY ONLY ON STANDARD UPRIGHTS WITH MAXIMUM FORK HEIGHTS UP TO AND INCLUDING 154".

**UPRIGHT DIMENSION TABLE**

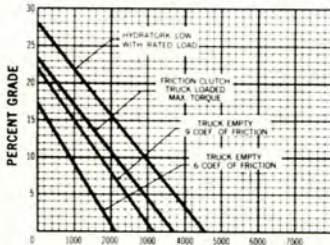
Max. Fork Ht. Std. Hi-Le	TSU	Over-all Height Lowered	Free Lift		
			Std.	Hi-Le	TSU
76	—	56	13½	32¾	—
82	—	59	13½	35¾	—
88	—	62	13½	38¾	—
94	126	65	13½	41¾	11½
100	135	68	13½	44¾	11½
*106	*144	71	13½	47¾	11½
112	153	74	13½	50¾	11½
118	162	77	13½	53¾	11½
124	171	80	13½	56¾	11½
*130	*180	83	13½	59¾	11½
136	189	86	13½	62¾	9½
142	198	89	13½	65¾	9½
148	207	** 92	11½	68¾	9½
*154	*216	** 95	11½	71¾	9½
160	225	** 99	13½	75¾	9½
172	243	**106	13½	82¾	9½
*178	252	**109	11½	85¾	9½
184	—	112	11½	88¾	—
190	—	116	13½	92¾	—
196	—	119	11½	95¾	—
202	—	123	13½	99¾	—
208	—	126	11½	102¾	—

\*PREFERRED STANDARD HEIGHTS.

\*\*ADD 1" FOR TRIPLE STAGE UPRIGHT.

FOR OVERALL HEIGHT RAISED (LESS LOAD BACK REST) ADD 24½" TO MAXIMUM FORK HEIGHT.

**GRADE & DRAWBAR PULL CHART**



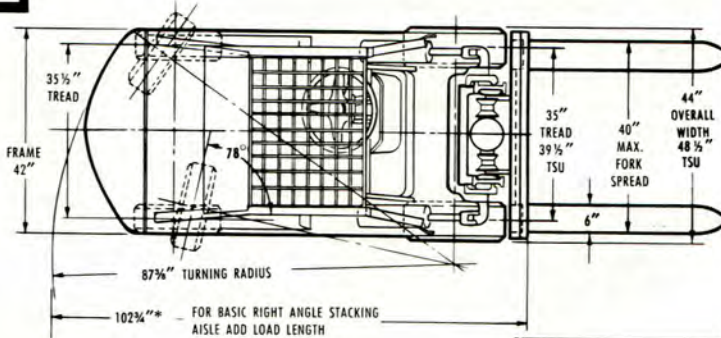
AVAILABLE DRAWBAR PULL IN POUNDS (WITH TOWING COUPLER 12" FROM FLOOR) — EMPTY TRUCK GRADES ARE WITH EITHER TRANSMISSION.



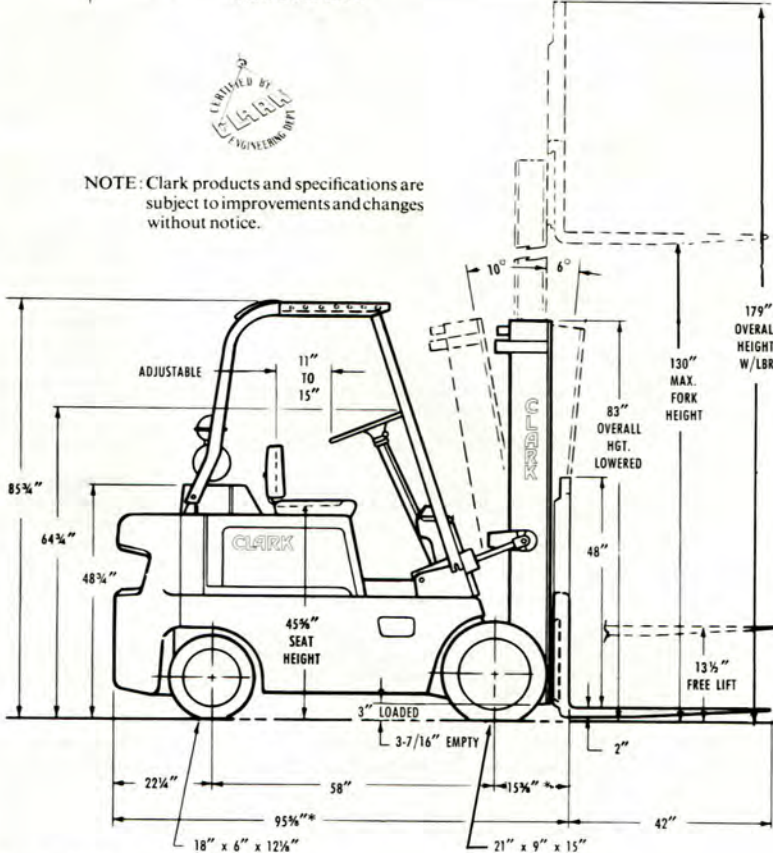
Industrial Truck Division  
Battle Creek, Michigan

GAS/DIESEL/ELECTRIC FORK LIFTS  
ELECTRIC NARROW AISLE TRUCKS  
ELECTRIC HAND TRUCKS/STRADDLE CARRIERS  
TOWING TRACTORS/COMPLETE LINE OF HANDLING DEVICES

SS1887D 106415ME



NOTE: Clark products and specifications are subject to improvements and changes without notice.



\*ADD 1½" FOR TRIPLE STAGE UPRIGHT



**E**NGINEERING  
**S**PECIFICATIONS

**CLARKLIFT® C 70D**

7,000 pounds capacity, 24 inch load center

**STANDARD HI-LO TSU**  
MODEL C(F) 70D Service Weight 10,910 lbs. 10,960 lbs. 11,580 lbs.  
Percent on drive wheels, truck empty: 36 %

**INSURANCE CLASSIFICATIONS.** The C(F)70D has as standard equipment those additional safeguards to the exhaust, fuel, and electrical systems that are required by U.L. for trucks designated DS. At this time approval by Underwriter's Laboratories is pending.

**DIMENSIONS**

Length (to front face of forks) _____	97¼"	Tread, drive _____	35"
Wheelbase _____	58"	Tread, steer _____	35½"
Width, standard _____	44"	Turning radius _____	88⅝"
		Basic aisle for right angle stacking (add load length) _____	104"

**UNDERCLEARANCES**

Upright _____	37/16"	Center of frame _____	51/8"
Drive axle _____	5/8"	Counterweight _____	4"
Steer axle _____	3/4"		

**SPEEDS AND GRADES**

Travel speeds with rated load _____	C 70D 9.7 M P H (853 F P M)	CF 70D 9.1 M P H (800 F P M)
Gradeability with rated load _____	25 %	20 %

	<b>STANDARD</b>	<b>HI-LO</b>	<b>TSU</b>
	Loaded Empty	Loaded Empty	Loaded Empty
Lifting speed (FPM) _____	76 90	72 86	71 85
Lowering speed " _____	60 80	60 65	60 80

Lift of 10 feet averages 12.4 seconds.

**DIESEL ENGINE.** General Motors 2 cylinder, 2 cycle, 2 valve. Rotor-type pump crankshaft driven. Quickly replaceable, cam-operated unit fuel injectors pressurize fuel at injector tip, eliminating high pressure fuel lines. Optional equipment includes push button cold weather priming system, controlled from within the operator compartment. System injects additives into engine air-intake for easier cold weather starting.

Model _____	2-53	Governed RPM with no load _____	2150
Bore _____	37/8"	SAE rated horsepower at 2150 RPM _____	47
Stroke _____	4½"	Max. SAE rated torque, lb. ft. at 1200 RPM _____	124
Displacement _____	106.1 cu. in.	Fuel tank capacity, gals. _____	11
Crankcase capacity _____	8 qts.		

**ENGINE FILTERS.** Three types: (1) Duo-fuel filter. (2) One quart oil filter with automotive-type replaceable cartridge. (3) Two-stage dry type in-take air filter with pre-cleaner that uses a washable replaceable pleated paper cartridge.

**ELECTRICAL SYSTEM.** 12-volt, 130 amp-hour battery; 14 amp enclosed generator. Enclosed electric starter motor has positive engagement, electrical cut-out. Weather-shielded key starting switch; electric horn; and multiple disconnect plug to instrument panel. Lights optional at extra cost.

**INSTRUMENTS.** Direct reading engine hour meter; ammeter, engine oil pressure, fuel, and temperature gauges, all mounted in cowl for easy reading.

**AXLE AND FINAL DRIVE.** Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full-floating drive axle assembly. Axle housing, not drive shaft, carries weight of truck. Final gear reduction is made through fully enclosed pinion and ring gear at drive wheels.

**HYDRATORK® TRANSMISSION.** Standard equipment on the C 70. Two-speed power shifted transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled through cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears, high and low range gears, are in constant mesh, and are full power shifted. Direction selection and range shift lever, for left-hand finger-tip control on steering column.

**HYDRAULIC INCHING.** In close quarters the "free-pedal" portion of either the left or the right inching-brake pedal, hydraulically actuates inching valve, permitting power to be gradually disengaged from the drive wheels, even when the engine is running at top speed for fast lifting.

**FRICION CLUTCH TRANSMISSION.** Standard equipment on the CF 70. "Quick change" 12" diameter single disc, dry plate clutch capacity of 300 lb. ft. of torque, controlled by low effort automotive type pedal. Two shift levers mounted on the steering column control the 3-speed transmission synchronized between 2nd and 3rd, and between forward and reverse.

**BRAKES.** Two systems. Hydraulic spot disc brakes provide powerful braking without sudden grabbing. Brakes are self-adjusting, and require no periodic maintenance for the life of the lining. Foot brake torque is multiplied through final reduction at each drive wheel to maximize braking, minimize pedal effort. Brakes are enclosed within drive axle housing. Mechanical parking brake operates on transmission drive shaft.

**STEERING.** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for floor level variations up to 3½". Positive stops for lateral stability. Inclined king pins minimize road shocks. Recirculated ball type steering gear with 18" diameter handwheel. Tie rods are automotive type.

**HYDRAULIC SYSTEM.** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads. Vane-type pump is driven directly by crankshaft. Hydraulic sump, built into frame of 3/8" thick plate has 9 gallon capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filter cap breather, (2) a 25-micron full flow filter in sump.

**SEATING.** Rubber mounted wide seat and back rest are Polyurethane foam, covered with vinyl plastic. Backrest is contoured, and center pivoted to fit position of driver, reducing driver fatigue. Automotive-type latch releases the seat for horizontal adjustment up to 4".

**MAINTENANCE.** Split swing-out hood offers easy access for servicing. Check points such as water and hydraulic sump filler caps, oil dipstick and filler readily accessible. Batteries swing out. Quickly detachable counterweight is hook mounted, secured with one large bolt.

**OVERHEAD GUARD AND LOAD BACK REST.** Driver's overhead guard and 48" high load back rest are standard equipment.

**ADDED ADVANTAGES.** Protectoseal gas tank filler cap; auxiliary fuel supply of ½ gallon; recessed pin-type coupler at 12"; multi-pass muffler; bolts and screws are zinc or cadmium plated; all exposed surfaces are shot-blasted and prime painted with weather resistant paint.

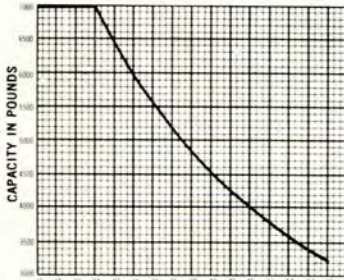
**COLORS.** Standard delivery color is two-tone silver-grey and yellow; optional colors with grey are red, orange, green and blue.

**DIMENSIONAL  
SPECIFICATIONS**

**CLARKLIFT® C 70D**

7,000 pounds capacity, 24 inch load center

**CAPACITY CHART**



LOAD CENTER IN INCHES FROM FRONT FACE OF FORKS—RATED CAPACITIES SHOWN ABOVE ARE COMPUTED WITH UPRIGHTS IN VERTICAL POSITION. THEY APPLY ONLY ON STANDARD UPRIGHTS WITH MAXIMUM FORK HEIGHTS UP TO AND INCLUDING 153"

**UPRIGHT DIMENSION TABLE**

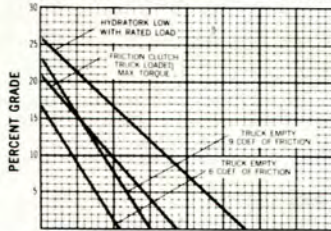
Max. Fork Ht. Std. Hi-Lo	TSU	Over-all Height Lowered	Free Lift		
			Std.	Hi-Lo	TSU
75	—	59	19 1/2	35 3/4	—
81	—	62	19 1/2	38 3/4	—
87	—	65	19 1/2	41 3/4	—
93	126	68	19 1/2	44 3/4	17 1/2
* 99	135	71	19 1/2	47 3/4	17 1/2
105	*144	74	19 1/2	50 3/4	17 1/2
111	153	77	19 1/2	53 3/4	17 1/2
117	162	80	19 1/2	56 3/4	17 1/2
*123	171	83	19 1/2	59 3/4	17 1/2
129	*180	86	19 1/2	62 3/4	17 1/2
135	189	89	19 1/2	65 3/4	15 1/2
141	198	** 92	19 1/2	68 3/4	17 1/2
*147	207	** 95	17 1/2	71 3/4	15 1/2
153	*216	** 99	19 1/2	75 3/4	17 1/2
159	225	**102	19 1/2	78 3/4	15 1/2
165	234	**106	19 1/2	82 3/4	17 1/2
*171	243	**109	19 1/2	85 3/4	15 1/2
177	—	112	17 1/2	88 3/4	—
183	—	116	19 1/2	92 3/4	—
189	—	119	19 1/2	95 3/4	—
195	—	123	19 1/2	99 3/4	—
201	—	126	19 1/2	102 3/4	—

\*PREFERRED STANDARD HEIGHTS.

\*\*ADD 1" FOR TRIPLE STAGE UPRIGHT.

FOR OVERALL HEIGHT RAISED (LESS LOAD BACK REST) ADD 24 1/2" TO MAXIMUM FORK HEIGHT.

**GRADE & DRAWBAR PULL CHART**



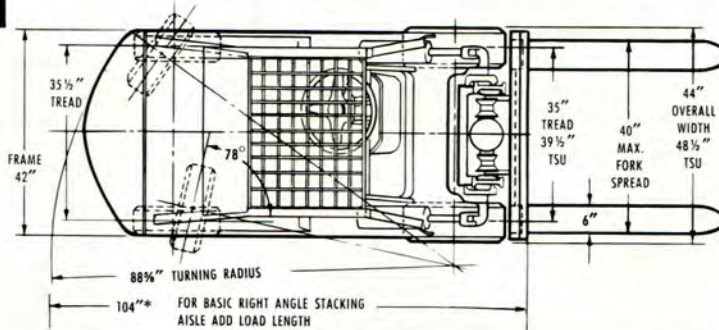
AVAILABLE DRAWBAR PULL IN POUNDS (WITH TOWING COUPLER 12" FROM FLOOR) — EMPTY TRUCK GRADES ARE WITH EITHER TRANSMISSION.



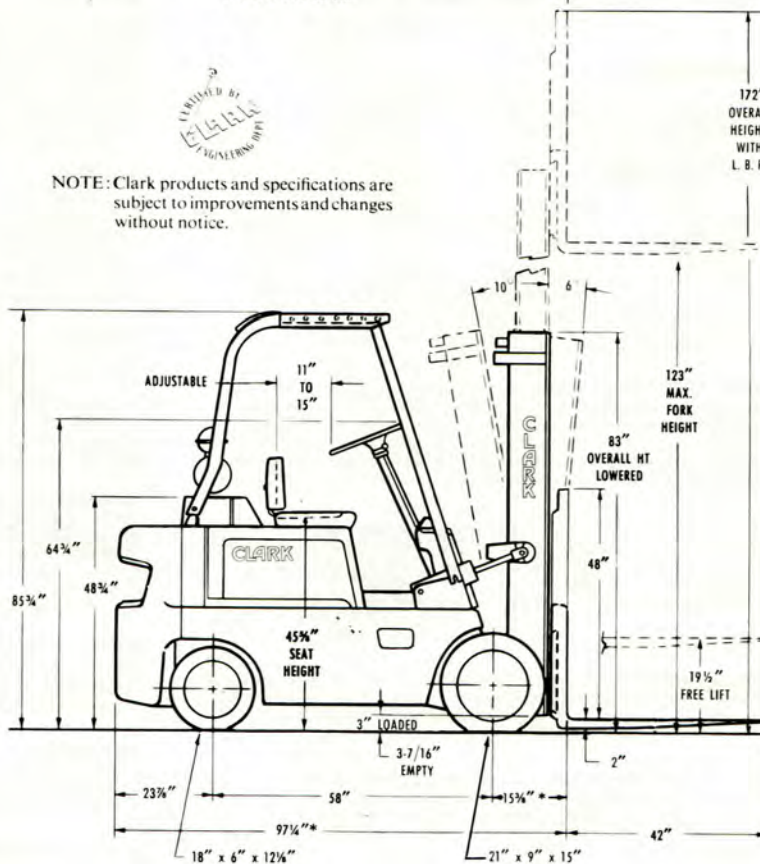
Industrial Truck Division  
Battle Creek, Michigan

GAS DIESEL ELECTRIC FORK LIFTS  
ELECTRIC NARROW AISLE TRUCKS  
ELECTRIC HAND TRUCKS/STRADDLE CARRIERS  
TOWING TRACTORS/COMPLETE LINE OF HANDLING DEVICES

SS1824D 106415ME



NOTE: Clark products and specifications are subject to improvements and changes without notice.



\*ADD 1 1/2" FOR TRIPLE STAGE UPRIGHT

PRINTED IN U.S.A.

**ENGINEERING  
SPECIFICATIONS**

**CLARKLIFT® C 80D**

8,000 pounds capacity, 24 inch load center

	<i>STANDARD</i>	<i>HI-LO</i>	<i>TSU</i>
<b>MODEL C(F) 80D Service Weight</b>	11,630 lbs.	11,680 lbs.	12,300 lbs.
Percent on drive wheels, truck empty: 31%			

**INSURANCE CLASSIFICATIONS.** The C(F)80D has as standard equipment those additional safeguards to the exhaust, fuel, and electrical systems that are required by U.L. for trucks designated DS. At this time approval by Underwriter's Laboratories is pending.

**DIMENSIONS**

Length (to front face of forks) _____	99¼"	Tread, drive _____	35"
Wheelbase _____	58"	Tread, steer _____	35½"
Width, standard _____	46"	Turning radius _____	90¾"
		Basic aisle for right angle stacking add load length) _____	106"

**UNDERCLEARANCES**

Upright _____	3¾"	Center of frame _____	5½"
Drive axle _____	5½"	Counterweight _____	4"
Steer axle _____	3¾"		

**SPEEDS AND GRADES**

	<i>C 80D</i>	<i>CF 80D</i>
Travel speeds with rated load _____	9.7 M P H (853 F P M )	9.1 M P H (800 F P M )
Gradeability with rated load _____	23%	19%

	<i>STANDARD</i>	<i>HI-LO</i>	<i>TSU</i>
	<i>Loaded</i>	<i>Empty</i>	<i>Loaded</i>
Lifting speed (FPM) _____	76	90	72
Lowering speed " _____	60	80	60
Lift of 10 feet averages _____	12.4 seconds.		

**DIESEL ENGINE.** General Motors 2 cylinder, 2 cycle, 2 valve. Rotor-type pump crankshaft driven. Quickly replaceable, cam-operated unit fuel injectors pressurize fuel at injector tip, eliminating high pressure fuel lines. Optional equipment includes push button cold weather priming system, controlled from within the operator compartment. System injects additives into engine air-intake for easier cold weather starting.

Model _____	2-53	Governed RPM with no load _____	2150
Bore _____	3⅞"	SAE rated horsepower at 2150 RPM _____	47
Stroke _____	4½"	Max. SAE rated torque, lb. ft. at 1200 RPM _____	124
Displacement _____	106.1 cu. in.	Fuel tank capacity, gals. _____	11
Crankcase capacity _____	8 qts.		

**ENGINE FILTERS.** Three types: (1) Duo-fuel filter. (2) One quart oil filter with automotive-type replaceable cartridge. (3) Two-stage dry type in-take air filter with pre-cleaner that uses a washable replaceable pleated paper cartridge.

**ELECTRICAL SYSTEM.** 12-volt, 130 amp-hour battery; 14 amp enclosed generator. Enclosed electric starter motor has positive engagement, electrical cut-out. Weather-shielded key starting switch; electric horn; and multiple disconnect plug to instrument panel. Lights optional at extra cost.

**INSTRUMENTS.** Direct reading engine hour meter; ammeter, engine oil pressure, fuel, and temperature gauges, all mounted in cowl for easy reading.

**AXLE AND FINAL DRIVE.** Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full-floating drive axle assembly. Axle housing, not drive shaft, carries weight of truck. Final gear reduction is made through fully enclosed pinion and ring gear at drive wheels.

**HYDRATORK® TRANSMISSION.** Standard equipment on the C 80. Two-speed power shifted transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled through cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears, high and low range gears, are in constant mesh, and are full power shifted. Direction selection and range shift lever, for left-hand finger-tip control on steering column.

**HYDRAULIC INCHING.** In close quarters the "free-pedal" portion of either the left or the right inching-brake pedal, hydraulically actuates inching valve, permitting power to be gradually disengaged from the drive wheels, even when the engine is running at top speed for fast lifting.

**FRICITION CLUTCH TRANSMISSION.** Standard equipment on the CF 80. "Quick change" 12" diameter single disc, dry plate clutch capacity of 300 lb. ft. of torque, controlled by low effort automotive type pedal. Two shift levers mounted on the steering column control the 3-speed transmission synchronized between 2nd and 3rd, and between forward and reverse.

**BRAKES.** Two systems. Hydraulic spot disc brakes provide powerful braking without sudden grabbing. Brakes are self-adjusting, and require no periodic maintenance for the life of the lining. Foot brake torque is multiplied through final reduction at each drive wheel to maximize braking, minimize pedal effort. Brakes are enclosed within drive axle housing. Mechanical parking brake operates on transmission drive shaft.

**STEERING.** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for floor level variations up to 3½". Positive stops for lateral stability. Inclined king pins minimize road shocks. Recirculated ball type steering gear with 18" diameter handwheel. Tie rods are automotive type.

**HYDRAULIC SYSTEM.** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads. Vane-type pump is driven directly by crankshaft. Hydraulic sump, built into frame of ⅜" thick plate has 10 gallon capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filler cap breather, (2) a 25-micron full flow filter in sump.

**SEATING.** Rubber mounted wide seat and back rest are Polyurethane foam, covered with vinyl plastic. Backrest is contoured, and center pivoted to fit position of driver, reducing driver fatigue. Automotive-type latch releases the seat for horizontal adjustment up to 4".

**MAINTENANCE.** Split swing-out hood offers easy access for servicing. Check points such as water and hydraulic sump filler caps, oil dipstick and filler readily accessible. Batteries swing out. Quickly detachable counterweight is hook mounted, secured with one large bolt.

**OVERHEAD GUARD AND LOAD BACK REST.** Driver's overhead guard and 48" high load back rest are standard equipment.

**ADDED ADVANTAGES.** Protectoseal gas tank filler cap; auxiliary fuel supply of ½ gallon; recessed pin-type coupler at 12"; multi-pass muffler; bolts and screws are zinc or cadmium plated; all exposed surfaces are shot-blasted and prime painted with weather resistant paint.

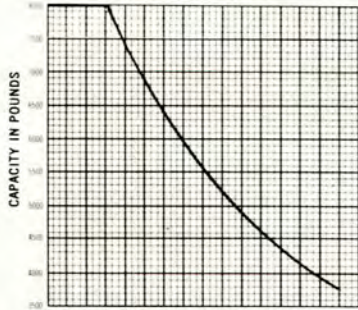
**COLORS.** Standard delivery color is two-tone silver-grey and yellow; optional colors with grey are red, orange, green and blue.

**DIMENSIONAL  
SPECIFICATIONS**

**CLARKLIFT® C 80D**

8,000 pounds capacity, 24 inch load center

**CAPACITY CHART**



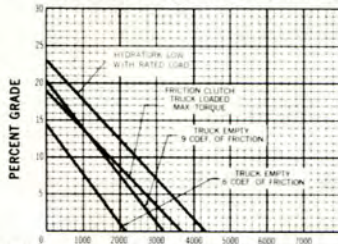
LOAD CENTER IN INCHES FROM FRONT FACE OF FORKS—RATED CAPACITIES SHOWN ABOVE ARE COMPUTED WITH UPRIGHTS IN VERTICAL POSITION. THEY APPLY ONLY ON STANDARD UPRIGHTS WITH MAXIMUM FORK HEIGHTS UP TO AND INCLUDING 153"

**UPRIGHT DIMENSION TABLE**

Max. Fork Ht. Std. Hi-Lo	TSU	Over-all Height Lowered	Free Lift		
			Std.	Hi-Lo	TSU
75	—	59	19 1/2	35 3/4	—
81	—	62	19 1/2	38 3/4	—
87	—	65	19 1/2	41 3/4	—
93	126	68	19 1/2	44 3/4	17 1/2
* 99	135	71	19 1/2	47 3/4	17 1/2
105	*144	74	19 1/2	50 3/4	17 1/2
111	153	77	19 1/2	53 3/4	17 1/2
117	162	80	19 1/2	56 3/4	17 1/2
*123	171	83	19 1/2	59 3/4	17 1/2
129	*180	86	19 1/2	62 3/4	17 1/2
135	189	89	19 1/2	65 3/4	15 1/2
141	198	** 92	19 1/2	68 3/4	17 1/2
*147	207	** 95	17 1/2	71 3/4	15 1/2
153	*216	** 99	19 1/2	75 3/4	17 1/2
159	225	**102	19 1/2	78 3/4	15 1/2
165	234	**106	19 1/2	82 3/4	17 1/2
*171	243	**109	19 1/2	85 3/4	15 1/2
177	—	112	17 1/2	88 3/4	—
183	—	116	19 1/2	92 3/4	—
189	—	119	19 1/2	95 3/4	—
195	—	123	19 1/2	99 3/4	—
201	—	126	19 1/2	102 3/4	—

\*PREFERRED STANDARD HEIGHTS.  
\*\*ADD 1" FOR TRIPLE STAGE UPRIGHT.  
FOR OVERALL HEIGHT RAISED (LESS LOAD BACK REST) ADD 24 1/2" TO MAXIMUM FORK HEIGHT.

**GRADE & DRAWBAR PULL CHART**



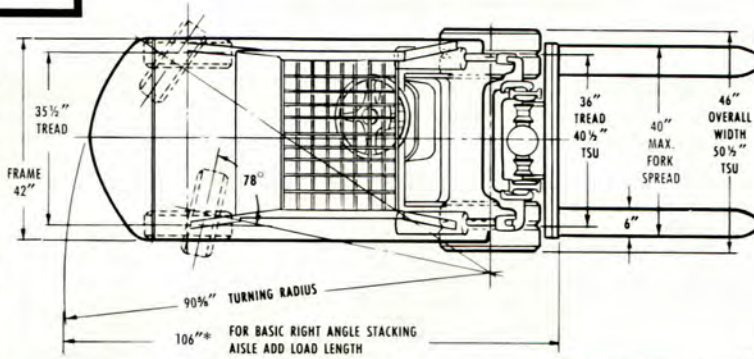
AVAILABLE DRAWBAR PULL IN POUNDS (WITH TOWING COUPLER 12" FROM FLOOR) — EMPTY TRUCK GRADES ARE WITH EITHER TRANSMISSION.



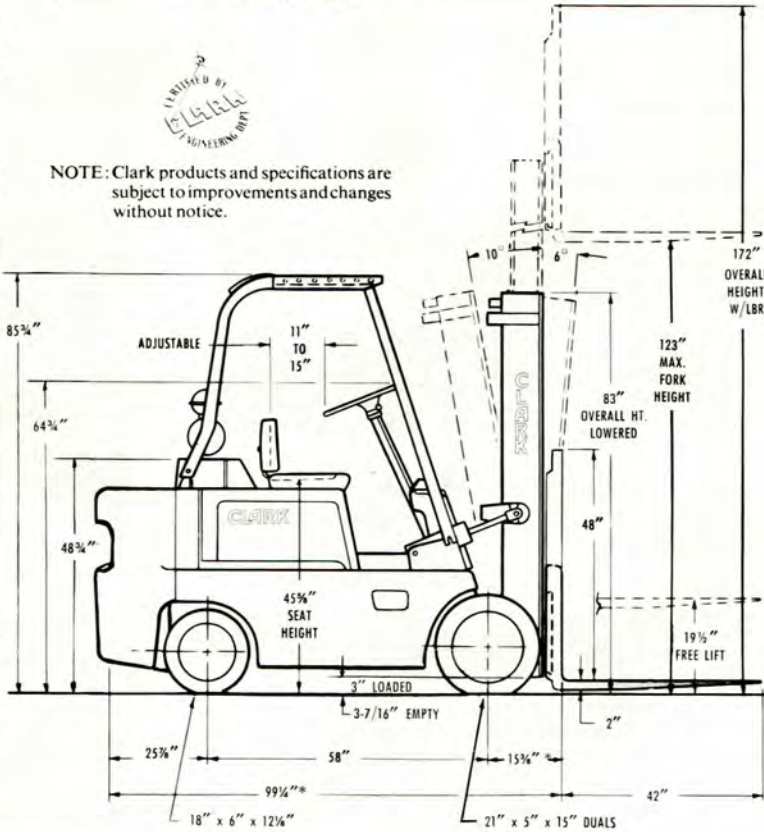
Industrial Truck Division  
Battle Creek, Michigan

GAS DIESEL ELECTRIC FORK LIFTS  
ELECTRIC NARROW AISLE TRUCKS  
ELECTRIC HAND TRUCKS/STRADDLE CARRIERS  
TOWING TRACTORS/COMPLETE LINE OF HANDLING DEVICES

SS1882D 106415ME



NOTE: Clark products and specifications are subject to improvements and changes without notice.



\*ADD 1 1/2" FOR TRIPLE STAGE UPRIGHT

**ENGINEERING**  
**SPECIFICATIONS**

**CLARKLIFT®**  
**CY 60D/CHY 60D**  
6,000 pounds capacity, 24 inch load center

<b>MODEL CY 60D/CHY 60D</b>	<b>STANDARD</b>	<b>HI-LO</b>	<b>TSU</b>
Service Weights (Single drive tires)	11,220 lbs.	11,270 lbs.	11,890 lbs.
Service Weights (Dual drive tires)	11,750 lbs.	11,800 lbs.	12,415 lbs.
Percent on drive wheels, truck empty:	52% (Single); 55% (Dual)		

<b>DIMENSIONS</b>			
Length (to front face of forks)	108½"	Tread (steer)	42½"
Wheelbase	69"	Turning radius (single drive tires)	98½"
Width (single drive tires)	50½"	Turning radius (dual drive tires)	103½"
(dual drive tires)	68½"	Basic aisle for right angle stacking (add load length)	
Tread (single drive tires)	40½"	(single drive tires)	119½"
(dual drive, outside tires)	60"	(dual drive tires)	124½"

<b>UNDERCLEARANCES (EMPTY)</b>			
Upright (single drive tires)	6"	Drive axle (dual drive tires)	8"
Upright (dual drive tires)	5"	Steer axle	8¼"
Drive axle (single drive tires)	9"	Center of frame	11"
		Counterweight	8¼"

<b>SPEEDS AND GRADES</b>		<b>CY 60D</b>	<b>CHY 60D</b>
Travel speeds with rated load			
Single drive tires		12.5 M P H (1100 F P M)	12.5 M P H (1100 F P M)
Dual drive tires		12.0 M P H (1055 F P M)	12.0 M P H (1055 F P M)
Gradeability with rated load			
Single drive tires		33.3	29.5
Dual drive tires		33.5	29.9

	<b>STANDARD</b>	<b>HI-LO</b>	<b>TSU</b>
	Loaded	Empty	Loaded
Lifting speed (FPM)	77	87	72
Lowering speed (FPM)	60	80	65

<b>TIRES — Standard Tires</b>		<b>Ply</b>	<b>Air Pressure</b>
Single drive	8.25x15	12	100 lbs.
Steer	7.00x12	12	100 lbs.
Optional Tires, Dual Drive	7.50x15	10	95 lbs.

**DIESEL ENGINE.** General Motors 3 cylinder, 2 cycle, 2 valve. Rotor type pump, crankshaft driven. Quickly replaceable, cam-operated, "L" fuel injectors (needle valve type) pressurize fuel at injector tip, eliminating high pressure fuel lines. "N" type high compression pistons.

Model	3-53
Bore	3¾"
Stroke	4½"
Displacement — cubic inches	159
Crankcase capacity — quarts	12
Governed rpm with no load	2400
SAE rated horsepower at 2400 rpm	73
SAE rated maximum torque — lb. ft. at 1200 rpm	185
Fuel tank capacity — gals.	15

**ENGINE FILTERS.** Four types — (1) A full-flow engine oil filter with a 40-micron replaceable type element. (2) Fuel strainer located between fuel tank and fuel pump with a 30-micron, replaceable density type element. (3) Fuel filter located between fuel pump and fuel injectors with a 10-micron replaceable paper type element. (4) Two stage, dry-type, intake air filter with an integral pre-cleaner that uses a washable, replaceable, pleated paper cartridge. Cool air is drawn from outside engine compartment.

**ELECTRICAL SYSTEM.** 12-volt, 150 amp-hour battery; 42 amp low cut-in alternator charges at idle. Enclosed electric starter motor has positive engagement, electrical cut-out. Weather-shielded key starting switch; electric horn; and multiple disconnect plug to instrument panel. Lights optional at extra cost.

**INSTRUMENTS.** Direct reading engine hour meter, ammeter, engine oil pressure, fuel and temperature gauges, all mounted in cowl for easy reading.

**DRIVE AXLE AND TRANSMISSION.** Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full floating drive axle assembly. Axle housing, not drive shaft, carries weight of truck. Final gear reduction is through fully enclosed pinion and ring gear at drive wheels.

**HYDRATORK® DRIVE.** (Model CY 60D). Two-speed power-shift transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled through a cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears and high and low range gears are in constant mesh. Direction selector lever for left-hand fingertip control on steering column.

**HYDRAULIC INCHING.** In close quarters, the "free pedal" portion of either the left or right foot inching-brake pedal, hydraulically actuates inching valve permitting power to be gradually disengaged from drive wheels, even when engine is running at top speed for fast lifting.

**HYDRACOOOL® CLUTCH.** (Model CHY 60D). Three-speed synchro-mesh transmission with Hydracool oil-sprayed 12-inch clutch. Provides for extended clutch life, better heat dissipation and smoother inching. Sump tank is integral with clutch housing. A pump delivers lubricant to clutch facing. Fluid is filtered with full-flow replaceable cartridge type filter. Pressure switch in spray tube controls warning light on dash.

**BRAKES.** Two systems. (1) Hydraulic spot disc brakes provide powerful braking without sudden grabbing. Brakes are self-adjusting, and require no periodic maintenance for the life of the lining. Foot brake torque is multiplied through final reduction at each drive wheel to maximize braking, minimize pedal effort. Brakes are enclosed within drive axle housing. (2) Mechanical parking brake operates on transmission drive shaft.

**STEERING.** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for ground level variations up to 6". Inclined king pins minimize road shocks. Recirculating ball type steering gear with 18" diameter handwheel. Automotive type tie rods.

**HYDRAULIC SYSTEM.** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads. Gear type pump is driven directly off crankshaft. Hydraulic sump, built into frame of ¾" thick plate has 13.5 gal. capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filler cap breather, (2) a 25-micron full flow filter in sump.

**SEATING.** Rubber mounted wide seat and backrest are Polyurethane foam, covered with vinyl plastic. Backrest is contoured, and center pivoted to fit position of driver, reducing driver fatigue. Automotive-type latch releases the seat for horizontal adjustment up to 4".

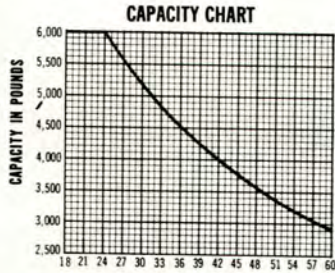
**OVERHEAD GUARD AND LOAD BACKREST EXTENSION.** Overhead guard and 48" high load backrest extension are standard equipment.

**ADDED ADVANTAGES.** Protectoseal fuel tank filler cap; recessed pin-type coupler at 12"; multi-pass muffler; bolts and screws are zinc or cadmium plated.

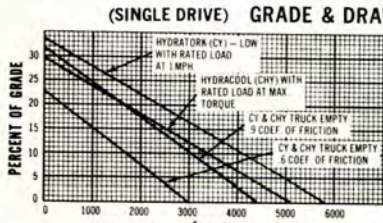
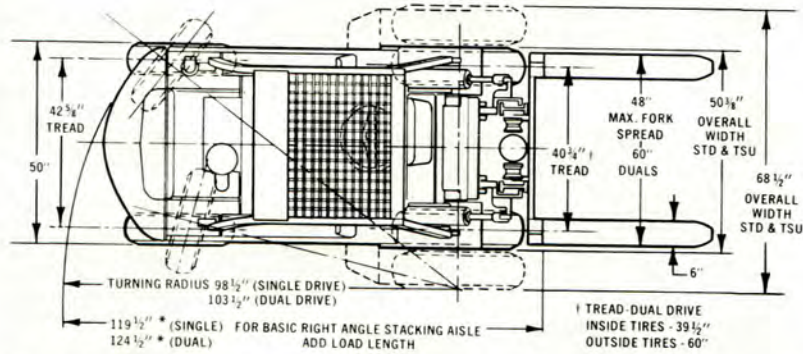
**PAINT.** Exposed surfaces are shot-blasted, primed and painted with weather resistant paint. Standard color is Clark Green with yellow wheel rims. Optional colors are solid yellow or orange.

**D**IMENSIONAL  
**S**PECIFICATIONS

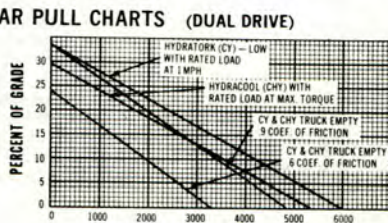
**CLARKLIFT®**  
**CY 60D/CHY 60D**  
6,000 pounds capacity, 24 inch load center



Load center in inches from front face of forks. Capacities shown above are computed with uprights in vertical position. Lifts above 153" maximum fork height, contact factory. Specific capacities will be shown on truck nameplate.



AVAILABLE DRAWBAR PULL IN POUNDS  
With towing coupler 12" from floor.

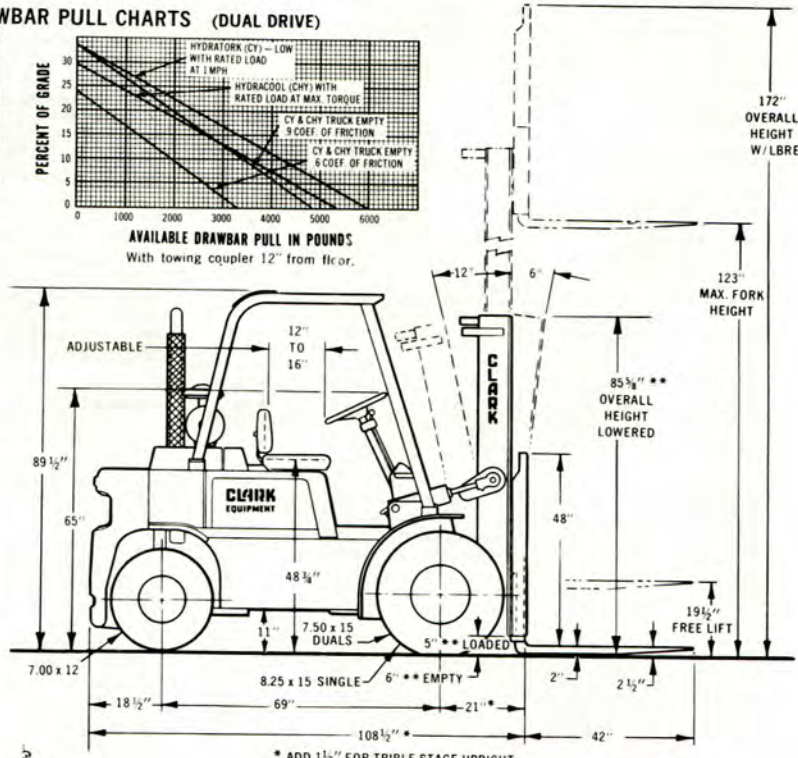


AVAILABLE DRAWBAR PULL IN POUNDS  
With towing coupler 12" from floor.

**UPRIGHT DIMENSION TABLE**

MAX. FORK HT.		OVERALL HEIGHT LOWERED†	FREE LIFE		
STD.	TSU & FFL TSU		STD.	H-LO & FFL TSU	TSU
75	—	61 1/4	19%	38%	—
81	—	64 1/4	19%	41%	—
87	—	67 1/4	19%	44%	—
93	126	70 1/4	19%	47%	17%
*99	135	73 1/4	19%	50%	17%
105	*144	76 1/4	19%	53%	17%
111	153	79 1/4	19%	56%	17%
117	162	82 1/4	19%	59%	17%
*123	171	85 1/4	19%	62%	17%
129	—	88 1/4	19%	65%	—
—	*180	90 1/4	—	—	17%
135	—	91 1/4	19%	68%	—
—	189	93 1/4	—	—	15%
141	—	94 1/4	19%	71%	—
*147	198	**97 1/4	17%	74%	17%
153	207	101 1/4	19%	78%	15%
159	—	104 1/4	19%	81%	—
—	*216	106 1/4	—	—	17%
165	225	**108 1/4	19%	85%	15%
*171	—	111 1/4	19%	88%	—
177	234	114 1/4	17%	91%	17%
—	243	117 1/4	—	—	15%
183	—	118 1/4	19%	95%	—
189	—	121 1/4	19%	98%	—
195	—	126 1/4	19%	102%	—
201	—	129 1/4	19%	105%	—

†Single Drive Tires—Subtract 1" for dual drive.  
\*Preferred standard heights.  
\*\*Add 1" for triple stage upright.  
For overall height raised, add 49" to MFH.  
Intermediate heights available in increments of 3" MFH.



\* ADD 1 1/2" FOR TRIPLE STAGE UPRIGHT  
\*\* DEDUCT 1" FOR DUAL DRIVE



Clark products and specifications are subject to improvements and changes without notice.

**ENGINEERING**  
**SPECIFICATIONS**

**CLARKLIFT®**  
**CY 70D/CHY 70D**  
7,000 pounds capacity, 24 inch load center

**MODEL CY 70D/CHY 70D**      **STANDARD**    **HI-LO**      **TSU**  
Service Weights (Single drive tires) 11,980 lbs. 12,030 lbs. 12,650 lbs.  
Service Weights (Dual drive tires) 12,370 lbs. 12,420 lbs. 13,040 lbs.  
Percent on drive wheels, truck empty: 48% (Single); 50% (Dual)

**DIMENSIONS**

Length (to front face of forks).....	110½"	Tread (steer).....	42% "
Wheelbase.....	69"	Turning radius (single drive tires).....	100½"
Width (single drive tires).....	50 ½"	Turning radius (dual drive tires).....	105½"
(dual drive tires).....	68 ½"	Basic aisle for right angle stacking (add load length) (single drive tires).....	121½"
Tread (single drive tires).....	40 ½"	(dual drive tires).....	126½"
(dual drive, outside tires).....	60"		

**UNDERCLEARANCES (EMPTY)**

Upright (single drive tires).....	6"	Drive axle (dual drive tires).....	8"
Upright (dual drive tires).....	5"	Steer axle.....	8 ¼"
Drive axle (single drive tires).....	9"	Center of frame.....	11"
		Counterweight.....	8 ¼"

**SPEEDS AND GRADES**

Travel speeds with rated load		<b>CY 70D</b>	<b>CHY 70D</b>
Single drive tires.....		12.3 M P H (1080 F P M)	12.3 M P H (1080 F P M)
Dual drive tires.....		12.0 M P H (1055 F P M)	12.0 M P H (1055 F P M)
Gradeability with rated load			
Single drive tires.....		30.4%	27.0%
Dual drive tires.....		30.6%	27.5%

	<b>STANDARD</b>		<b>HI-LO</b>		<b>TSU</b>	
Lifting speed (FPM)	Loaded	Empty	Loaded	Empty	Loaded	Empty
Lowering speed (FPM)	77	87	72	82	72	82
	60	80	60	65	60	80

**TIRES — Standard Tires**

Single drive.....	8.25x15	<b>Ply</b>	<b>Air Pressure</b>
Steer.....	7.00x12	12	100 lbs.
Optional Tires, Dual Drive.....	7.50x15	10	95 lbs.

**DIESEL ENGINE.** General Motors 3 cylinder, 2 cycle, 2 valve. Rotor type pump, crankshaft driven. Quickly replaceable, cam-operated, "L" fuel injectors (needle valve type) pressurize fuel at injector tip, eliminating high pressure fuel lines. "N" type high compression pistons.

Model.....	3-53
Bore.....	3 7/8"
Stroke.....	4 1/2"
Displacement — cubic inches.....	159
Crankcase capacity — quarts.....	12
Governed rpm with no load.....	2400
SAE rated horsepower at 2400 rpm.....	73
SAE rated maximum torque — lb. ft. at 1200 rpm.....	185
Fuel tank capacity — gals.....	15

**ENGINE FILTERS.** Four types — (1) A full-flow engine oil filter with a 40-micron replaceable type element. (2) Fuel strainer located between fuel tank and fuel pump with a 30-micron, replaceable density type element. (3) Fuel filter located between fuel pump and fuel injectors with a 10-micron replaceable paper type element. (4) Two stage, dry-type, intake air filter with an integral pre-cleaner that uses a washable, replaceable, pleated paper cartridge. Cool air is drawn from outside engine compartment.

**ELECTRICAL SYSTEM.** 12-volt, 150 amp-hour battery; 42 amp low cut-in alternator charges at idle. Enclosed electric starter motor has positive engagement, electrical cut-out. Weather-shielded key starting switch; electric horn; and multiple disconnect plug to instrument panel. Lights optional at extra cost.

**INSTRUMENTS.** Direct reading engine hour meter, ammeter, engine oil pressure, fuel and temperature gauges, all mounted in cowl for easy reading.

**DRIVE AXLE AND TRANSMISSION.** Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full floating drive axle assembly. Axle housing-not drive shaft, carries weight of truck. Final gear reduction is through fully enclosed pinion and ring gear at drive wheels.

**HYDRATORK® DRIVE.** (Model CY 70D). Two-speed power-shift transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled through a cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears and high and low range gears are in constant mesh. Direction selector lever for left-hand fingertip control on steering column.

**HYDRAULIC INCHING.** In close quarters, the "free pedal" portion of either the left or right foot inching-brake pedal, hydraulically actuates inching valve permitting power to be gradually disengaged from drive wheels, even when engine is running at top speed for fast lifting.

**HYDRACOOOL® CLUTCH.** (Model CHY 70D). Three-speed synchro-mesh transmission with Hydracool oil-sprayed 12-inch clutch. Provides for extended clutch life, better heat dissipation and smoother inching. Sump tank is integral with clutch housing. A pump delivers lubricant to clutch facing. Fluid is filtered with full-flow replaceable cartridge type filter. Pressure switch in spray tube controls warning light on dash.

**BRAKES.** Two systems. (1) Hydraulic spot disc brakes provide powerful braking without sudden grabbing. Brakes are self-adjusting, and require no periodic maintenance for the life of the lining. Foot brake torque is multiplied through final reduction at each drive wheel to maximize braking, minimize pedal effort. Brakes are enclosed within drive axle housing. (2) Mechanical parking brake operates on transmission drive shaft.

**STEERING.** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for ground level variations up to 6". Inclined king pins minimize road shocks. Recirculating ball type steering gear with 18" diameter handwheel. Automotive type tie rods.

**HYDRAULIC SYSTEM.** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads. Gear type pump is driven directly off crankshaft. Hydraulic sump, built into frame of 3/8" thick plate has 13.5 gal. capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filler cap breather, (2) a 25-micron full flow filter in sump.

**SEATING.** Rubber mounted wide seat and backrest are Polyurethane foam, covered with vinyl plastic. Backrest is contoured, and center pivoted to fit position of driver, reducing driver fatigue. Automotive-type latch releases the seat for horizontal adjustment up to 4".

**OVERHEAD GUARD AND LOAD BACKREST EXTENSION.** Overhead guard and 48" high load backrest extension are standard equipment.

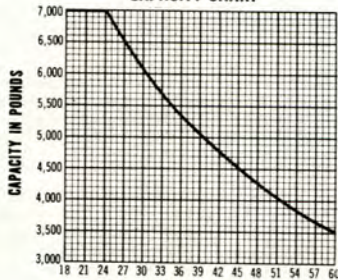
**ADDED ADVANTAGES.** Protectoseal fuel tank filler cap; recessed pin-type coupler at 12"; multi-pass muffler; bolts and screws are zinc or cadmium plated.

**PAINT.** Exposed surfaces are shot-blasted, primed and painted with weather resistant paint. Standard color is Clark Green with yellow wheel rims. Optional colors are solid yellow or orange.

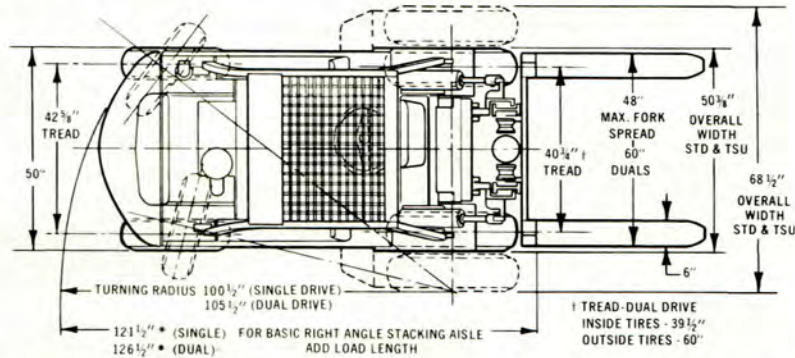
**DIMENSIONAL  
SPECIFICATIONS**

**CLARKLIFT®  
CY 70D/CHY 70D**  
7,000 pounds capacity, 24 inch load center

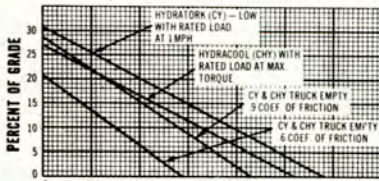
**CAPACITY CHART**



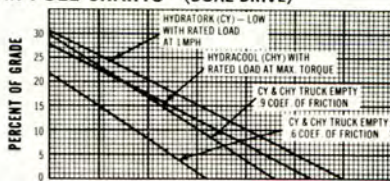
Load center in inches from front face of forks. Capacities shown above are computed with uprights in vertical position. Lifts above 153" maximum fork height, contact factory. Specific capacities will be shown on truck nameplate.



**(SINGLE DRIVE) GRADE & DRAWBAR PULL CHARTS (DUAL DRIVE)**



**AVAILABLE DRAWBAR PULL IN POUNDS**  
With towing coupler 12" from floor.

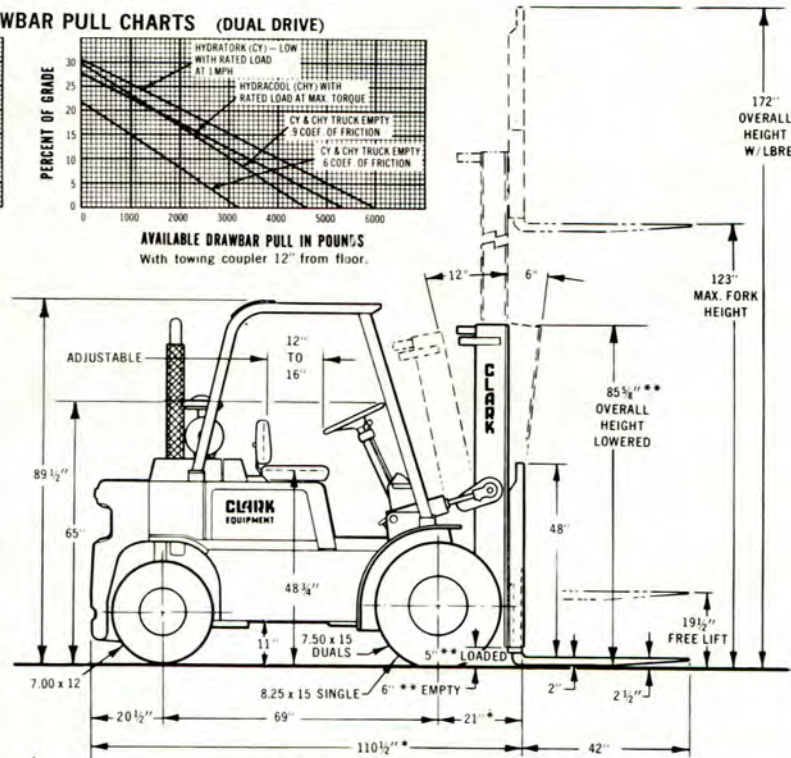


**AVAILABLE DRAWBAR PULL IN POUNDS**  
With towing coupler 12" from floor.

**UPRIGHT DIMENSION TABLE**

MAX. FORK HT. STD. HI-LO	TSU & FFL TSU	OVERALL HEIGHT LOWERED <sup>1</sup>	FREE LIFE		
			STD.	HI-LO & FFL TSU	TSU
75	—	61 3/4	19%	38%	—
81	—	64 3/4	19%	41%	—
87	—	67 3/4	19%	44%	—
93	126	70 3/4	19%	47%	17%
*99	135	73 3/4	19%	50%	17%
105	*144	76 3/4	19%	53%	17%
111	153	79 3/4	19%	56%	17%
117	162	82 3/4	19%	59%	17%
*123	171	85 3/4	19%	62%	17%
129	—	88 3/4	19%	65%	—
—	*180	90 3/4	—	—	17%
135	—	91 3/4	19%	68%	—
—	189	93 3/4	—	—	15%
141	—	94 3/4	19%	71%	—
*147	198	**97 3/4	17%	74%	17%
153	207	101 3/4	19%	78%	15%
159	—	104 3/4	19%	81%	—
—	*216	106 3/4	—	—	17%
165	225	**108 3/4	19%	85%	15%
*171	—	111 3/4	19%	88%	—
177	234	114 3/4	17%	91%	17%
—	243	117 3/4	—	—	15%
183	—	118 3/4	19%	95%	—
189	—	121 3/4	19%	98%	—
195	—	126 3/4	19%	102%	—
201	—	129 3/4	19%	105%	—

<sup>1</sup>Single Drive Tires—Subtract 1" for dual drive.  
\*Preferred standard heights.  
\*\*Add 1" for triple stage upright.  
For overall height raised, add 49" to MFH.  
Intermediate heights available in increments of 3" MFH.



\* ADD 1 1/2" FOR TRIPLE STAGE UPRIGHT  
\*\* DEDUCT 1" FOR DUAL DRIVE

Clark products and specifications are subject to improvements and changes without notice.





**E**NGINEERING  
**S**PECIFICATIONS

**CLARKLIFT<sup>®</sup>**  
**CY 80D / CHY 80D**  
8,000 pounds capacity, 24 inch load center

**MODEL CY 80D/CHY 80D**  
Service Weights (Single drive tires) 12,820 lbs. 12,870 lbs. 13,490 lbs.  
Service Weights (Dual drive tires) 13,210 lbs. 13,260 lbs. 13,880 lbs.  
Percent on drive wheels, truck empty: 43% (Single); 44% (Dual)

**DIMENSIONS**  
Length (to front face of forks).....112 7/8"  
Wheelbase.....69"  
Width (single drive tires).....50 1/2"  
(dual drive tires).....68 1/2"  
Tread (single drive tires).....40 1/4"  
(dual drive.....60"  
outside tires).....60"  
Tread (steer).....42%  
Turning radius (single drive tires).....102%  
Turning radius (dual drive tires).....107%  
Basic aisle for right angle stacking (add load length)  
(single drive tires).....123%  
(dual drive tires).....128%

**UNDERCLEARANCES (EMPTY)**  
Upright (single drive tires).....6"  
Upright (dual drive tires).....5"  
Drive axle (single drive tires).....9"  
Drive axle (dual drive tires).....8"  
Steer axle.....8 1/4"  
Center of frame.....11"  
Counterweight.....8 1/4"

**SPEEDS AND GRADES**  
Travel speeds with rated load  
Single drive tires.....11.6 M P H (1020 F P M)  
Dual drive tires.....11.0 M P H (968 F P M)  
CY 80D CHY 80D  
11.6 M P H 11.6 M P H  
(1020 F P M) (1020 F P M)  
11.0 M P H 11.0 M P H  
(968 F P M) (968 F P M)

Gradeability with rated load  
Single drive tires.....27.7%  
Dual drive tires.....27.9%  
24.6%  
24.9%

	STANDARD		HI-LO		TSU	
	Loaded	Empty	Loaded	Empty	Loaded	Empty
Lifting speed (FPM)	77	87	72	82	72	82
Lowering speed (FPM)	60	80	60	65	60	80

**TIRES — Standard Tires**  
Single drive 8.25x15 12 100 lbs.  
Steer 7.00x12 12 100 lbs.  
Optional Tires, Dual Drive 7.50x15 10 95 lbs.  
Ply Air Pressure

**DIESEL ENGINE.** General Motors 3 cylinder, 2 cycle, 2 valve. Rotor type pump, crankshaft driven. Quickly replaceable, cam-operated, "L" fuel injectors (needle valve type) pressurize fuel at injector tip, eliminating high pressure fuel lines. "N" type high compression pistons.

Model	3-53
Bore	3 7/8"
Stroke	4 1/2"
Displacement — cubic inches	159
Crankcase capacity — quarts	12
Governed rpm with no load	2400
SAE rated horsepower at 2400 rpm	73
SAE rated maximum torque — lb. ft. at 1200 rpm	185
Fuel tank capacity — gals.	15

**ENGINE FILTERS.** Four types — (1) A full-flow engine oil filter with a 40-micron replaceable type element. (2) Fuel strainer located between fuel tank and fuel pump with a 30-micron, replaceable density type element. (3) Fuel filter located between fuel pump and fuel injectors with a 10-micron replaceable paper type element. (4) Two stage, dry-type, intake air filter with an integral pre-cleaner that uses a washable, replaceable, pleated paper cartridge. Cool air is drawn from outside engine compartment.

**ELECTRICAL SYSTEM.** 12-volt, 150 amp-hour battery; 42 amp low cut-in alternator charges at idle. Enclosed electric starter motor has positive engagement, electrical cut-out. Weather-shielded key starting switch; electric horn; and multiple disconnect plug to instrument panel. Lights optional at extra cost.

**INSTRUMENTS.** Direct reading engine hour meter, ammeter, engine oil pressure, fuel and temperature gauges, all mounted in cowl for easy reading.

**DRIVE AXLE AND TRANSMISSION.** Integral assembly with 3-point mounting including engine, torque converter, transmission, spiral bevel pinion and ring gear, differential and full floating drive axle assembly. Axle housing-not drive shaft, carries weight of truck. Final gear reduction is through fully enclosed pinion and ring gear at drive wheels.

**HYDRATORK<sup>®</sup> DRIVE.** (Model CY 80D). Two-speed power-shift transmission has torque converter which multiplies engine torque without shock on drive shaft and gears. Transmission oil is cooled through a cooler in bottom radiator tank and is a filtered system with replaceable type cartridge. The forward and reverse gears and high and low range gears are in constant mesh. Direction selector lever for left-hand fingertip control on steering column.

**HYDRAULIC INCHING.** In close quarters, the "free pedal" portion of either the left or right foot inching-brake pedal, hydraulically actuates inching valve permitting power to be gradually disengaged from drive wheels, even when engine is running at top speed for fast lifting.

**HYDRACOOOL<sup>®</sup> CLUTCH.** (Model CHY 80D). Three-speed synchro-mesh transmission with Hydracool oil-sprayed 12-inch clutch. Provides for extended clutch life, better heat dissipation and smoother inching. Sump tank is integral with clutch housing. A pump delivers lubricant to clutch facing. Fluid is filtered with full-flow replaceable cartridge type filter. Pressure switch in spray tube controls warning light on dash.

**BRAKES.** Two systems. (1) Hydraulic spot disc brakes provide powerful braking without sudden grabbing. Brakes are self-adjusting, and require no periodic maintenance for the life of the lining. Foot brake torque is multiplied through final reduction at each drive wheel to maximize braking, minimize pedal effort. Brakes are enclosed within drive axle housing. (2) Mechanical parking brake operates on transmission drive shaft.

**STEERING.** Power steering is standard. Steering control is maintained through mechanical linkage in the event of power failure. Strong vanadium steel steer axle is mounted on two torsional rubber bushings to cushion shock and to provide articulation for ground level variations up to 6". Inclined king pins minimize road shocks. Recirculating ball type steering gear with 18" diameter handwheel. Automotive type tie rods.

**HYDRAULIC SYSTEM.** Full feathering balanced spool type valves for gentle starts and stops. Built-in pressure relief valve protects system against overloads. Gear type pump is driven directly off crankshaft. Hydraulic sump, built into frame of 3/4" thick plate has 13.5 gal. capacity. Flexible rubber hydraulic hose lines are steel braid reinforced. System is protected from dirt by (1) a 5-micron pleated replacement filler cap breather, (2) a 25-micron full flow filter in sump.

**SEATING.** Rubber mounted wide seat and backrest are Polyurethane foam, covered with vinyl plastic. Backrest is contoured, and center pivoted to fit position of driver, reducing driver fatigue. Automotive-type latch releases the seat for horizontal adjustment up to 4".

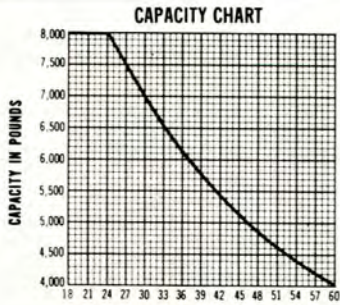
**OVERHEAD GUARD AND LOAD BACKREST EXTENSION.** Overhead guard and 48" high load backrest extension are standard equipment.

**ADDED ADVANTAGES.** Protectoseal fuel tank filler cap; recessed pin-type coupler at 12"; multi-pass muffler; bolts and screws are zinc or cadmium plated.

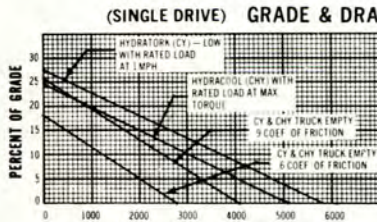
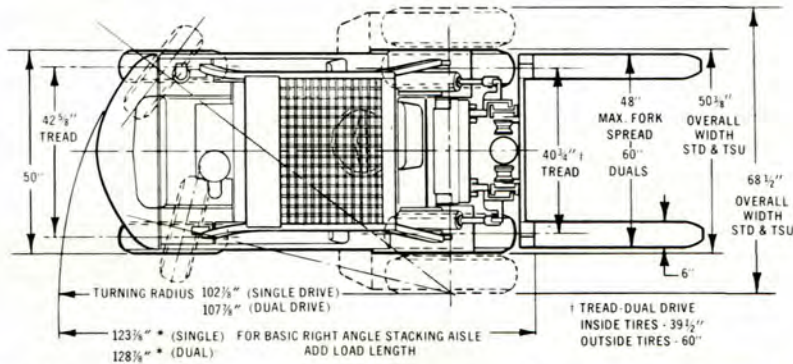
**PAINT.** Exposed surfaces are shot-blasted, primed and painted with weather resistant paint. Standard color is Clark Green with yellow wheel rims. Optional colors are solid yellow or orange.

**D**IMENSIONAL  
**S**PECIFICATIONS

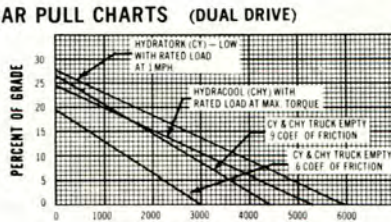
**CLARKLIFT®**  
**CY 80D / CHY 80D**  
8,000 pounds capacity, 24 inch load center



Load center in inches from front face of forks. Capacities shown above are computed with uprights in vertical position. Lifts above 153" maximum fork height, contact factory. Specific capacities will be shown on truck nameplate.



AVAILABLE DRAWBAR PULL IN POUNDS  
With towing coupler 12" from floor.

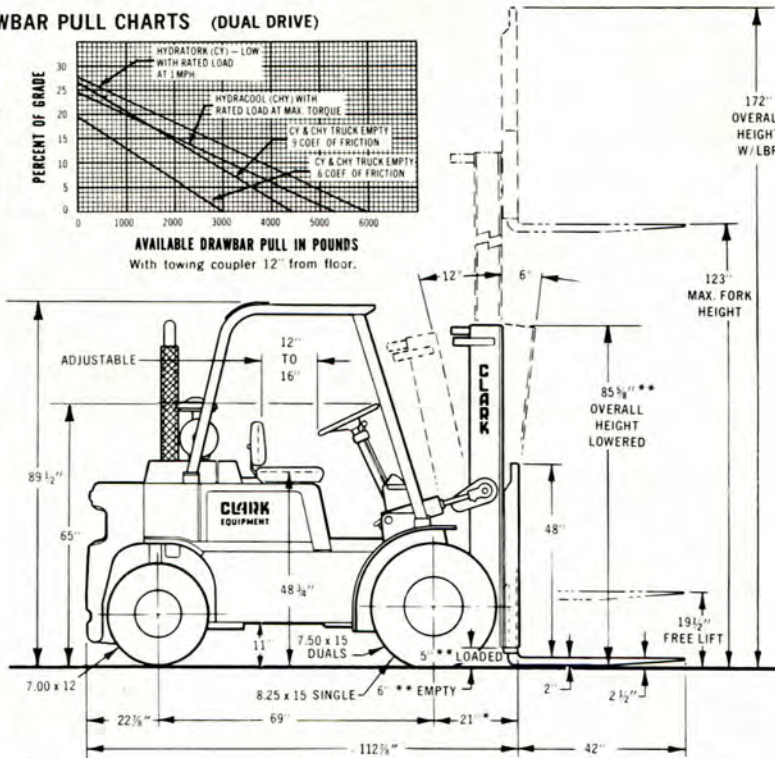


AVAILABLE DRAWBAR PULL IN POUNDS  
With towing coupler 12" from floor.

**UPRIGHT DIMENSION TABLE**

MAX. FORK HT.	OVERALL HEIGHT LOWERED†		FREE LIFE		
	STD. HI-LO	TSU & FFL TSU	STD.	HI-LO & FFL TSU	TSU
75	—	61 1/4	19 1/2	38 1/2	—
81	—	64 1/4	19 1/2	41 1/2	—
87	—	67 1/4	19 1/2	44 1/2	—
93	126	70 1/4	19 1/2	47 1/2	17 1/2
*99	135	73 1/4	19 1/2	50 1/2	17 1/2
105	*144	76 1/4	19 1/2	53 1/2	17 1/2
111	153	79 1/4	19 1/2	56 1/2	17 1/2
117	162	82 1/4	19 1/2	59 1/2	17 1/2
*123	171	85 1/4	19 1/2	62 1/2	17 1/2
129	—	88 1/4	19 1/2	65 1/2	—
—	*180	90 1/4	—	—	17 1/2
135	—	91 1/4	19 1/2	68 1/2	—
—	189	93 1/4	—	—	15 1/2
141	—	94 1/4	19 1/2	71 1/2	—
*147	198	*97 1/4	17 1/2	74 1/2	17 1/2
153	207	101 1/4	19 1/2	78 1/2	15 1/2
159	—	104 1/4	19 1/2	81 1/2	—
—	*216	106 1/4	—	—	17 1/2
165	225	*108 1/4	19 1/2	85 1/2	15 1/2
*171	—	111 1/4	19 1/2	88 1/2	—
177	234	114 1/4	17 1/2	91 1/2	17 1/2
—	243	117 1/4	—	—	15 1/2
183	—	118 1/4	19 1/2	95 1/2	—
189	—	121 1/4	19 1/2	98 1/2	—
195	—	126 1/4	19 1/2	102 1/2	—
201	—	129 1/4	19 1/2	105 1/2	—

†Single Drive Tires—Subtract 1" for dual drive.  
\*Preferred standard heights.  
\*\*Add 1" for triple stage upright.  
For overall height raised, add 49" to MFH.  
Intermediate heights available in increments of 3" MFH.



\* ADD 1 1/2" FOR TRIPLE STAGE UPRIGHT  
\*\* DEDUCT 1" FOR DUAL DRIVE



Clark products and specifications are subject to improvements and changes without notice.



# INDUSTRIAL TRUCK DIVISION



## SPECIFICATIONS

For machines equipped with diesel engines, refer to your diesel engine manual for specifications on the engine and its' accessories; items prefixed by a plus sign '+'.  
 + Cooling System Capacity.....15 quarts  
 + Fan Belt Deflection (long span).....3/4"

Clutch Pedal Free Travel (CF & CFY).....  
 .....5/8 to 1 inch  
 Brake Pedal Free Travel.....3/16 to 5/16 inch

Torque Converter (C & CY)....diameter 11 inches  
 .....Torque multiplication 2 to 1

Transmission Hydratork Friction Clutch

Speeds: 2 3  
 Capacity: 13 quarts 12 1/2 pints

### STEERING AXLE

Toe in.....0 degrees  
 Camber.....1 degree  
 Caster.....0 degrees

Left hand turning radius angle:

	C(F) MODELS	C(F)Y MODELS
Left wheel	78 deg	75 deg
Right wheel	55 deg 42'	52 deg

Right hand turning radius angle:

	C(F) MODELS	C(F)Y MODELS
Left wheel	55 deg 42'	52 deg
Right wheel	78 deg	75 deg

### DRIVE AXLE

	C(F)MODELS/C(F)Y MODELS	
Ratio-Bevel Gear...	4.375 to 1	5.286 to 1
Wheel Reduction.....	4.09 to 1	4.09 to 1
Axle end (grease) capacity.....	1 1/4 pounds	1 1/4 pounds

### MAIN HYDRAULIC PUMP

Type.....Vane  
 Capacity.....17 GPM @ 2250 engine RPM

### STEERING PUMP

Type.....Vane  
 Capacity:.....  
 .....regulated to 2 GPM by flow control

### HYDRAULIC VALVE

Pressure Relief Valve Setting.....  
 .....2000 PSI @ 2250 engine RPM

## + ELECTRICAL SYSTEM

### Starting Motor

Brush tension (min).....35 oz.  
 Rotation viewing D.E.....C  
 Spec. No.....2441

#### No load test:

Volts.....10.6  
 Min. amps.....49\*  
 Max. amps.....76\*  
 Min RPM.....6200  
 Max. RPM.....9400

#### Resistance test:

Volts.....4.3  
 Min amps.....270  
 Max amps.....310

### Distributor

Rotation viewing D.E.....C  
 Point opening (in).....021  
 Cam angle (deg).....22-26  
 Spec. No.....70  
 Centrifugal advance:

#### Start

RPM.....300  
 Deg.....3-2.3

#### Intermediate

RPM.....400  
 Deg.....3-5

#### Intermediate

RPM.....800  
 Deg.....5.5-7.5

#### Maximum

RPM.....1100  
 Deg.....7.5-9.5

### Generator

Rotation.....C  
 Circuit.....A  
 Brush spring tension.....24-32  
 Field Current

Amps.....1.69-1.79  
 Volts.....12.0

#### Cold output

Amps.....25.0  
 Volts.....14.0  
 RPM.....1970

### Voltage regulator

Circuit.....A  
 Polarity.....N  
 Spec. No.....2146

#### Cutout Relay

Air gap (in).....020  
 Point opening.....020  
 Closing voltage range..11.8-13.5

#### Voltage regulator

Air gap (in).....075  
 Volt setting range.....  
 .....14.2-15.2 at 85 degrees

#### Current regulator

Air gap (in).....075  
 Current setting range.....  
 .....24.5-29 at 85 degrees



# INDUSTRIAL TRUCK DIVISION



## SPECIFICATIONS

Ignition timing.....2 degrees BTDC

### SPARK PLUGS

Gap (in).....Standard .025  
.....Resistor .035

### BATTERY (12 Volt)

20 hr. rate @ 61 amp. hr.  
300 amp. @ 1.6 min. @ 0 deg F  
300 amp. @ 10 sec. @ 7.7 volts @ 0 deg F  
6 cell, 66 plates  
Group number SAE 25 MD.

### WHEEL NUT TORQUE

Steering wheels.....275-300 lb. ft.  
Drive wheels.....450-500 lb. ft.

\* Includes solenoid.



# INDUSTRIAL TRUCK DIVISION



## SPECIFICATIONS

### L.P.Gas and Gasoline ENGINE TORQUE SPECIFICATIONS

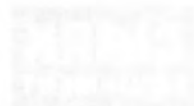
Engines have many studs, bolts, and cap screws of special material and sizes and it is very important that care be exercised to torque all studs and bolts correctly.

The torque specifications, foot pounds, listed below MUST be followed in order to have the engine conform to the original specifications.

Size - Diameter	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"
Cylinder Heads	-----	35-40	70-85	100-110	130-140	145-155
Manifolds	15-20	25-30	40-50	50-60	50-60	60-70
Gear Covers, Water Pumps, Front and Rear End Plates	15-20	25-30	50-55	80-90	-----	-----
Oil Pans	12-16	12-16	-----	-----	-----	-----



# INDUSTRIAL TRUCK DIVISION



INDUSTRIAL TRUCK DIVISION

INDUSTRIAL TRUCK DIVISION

The following information is for your information and is not to be used as a basis for any action. It is subject to change without notice and is not to be construed as a contract. It is intended for your information only.

Model	Capacity	Speed	Weight	Dimensions	Price	Availability
Model A	1000 lbs	10 mph	1500 lbs	48" x 48" x 48"	\$1500	Available
Model B	2000 lbs	15 mph	2500 lbs	54" x 54" x 54"	\$2500	Available
Model C	3000 lbs	20 mph	3500 lbs	60" x 60" x 60"	\$3500	Available
Model D	4000 lbs	25 mph	4500 lbs	66" x 66" x 66"	\$4500	Available
Model E	5000 lbs	30 mph	5500 lbs	72" x 72" x 72"	\$5500	Available

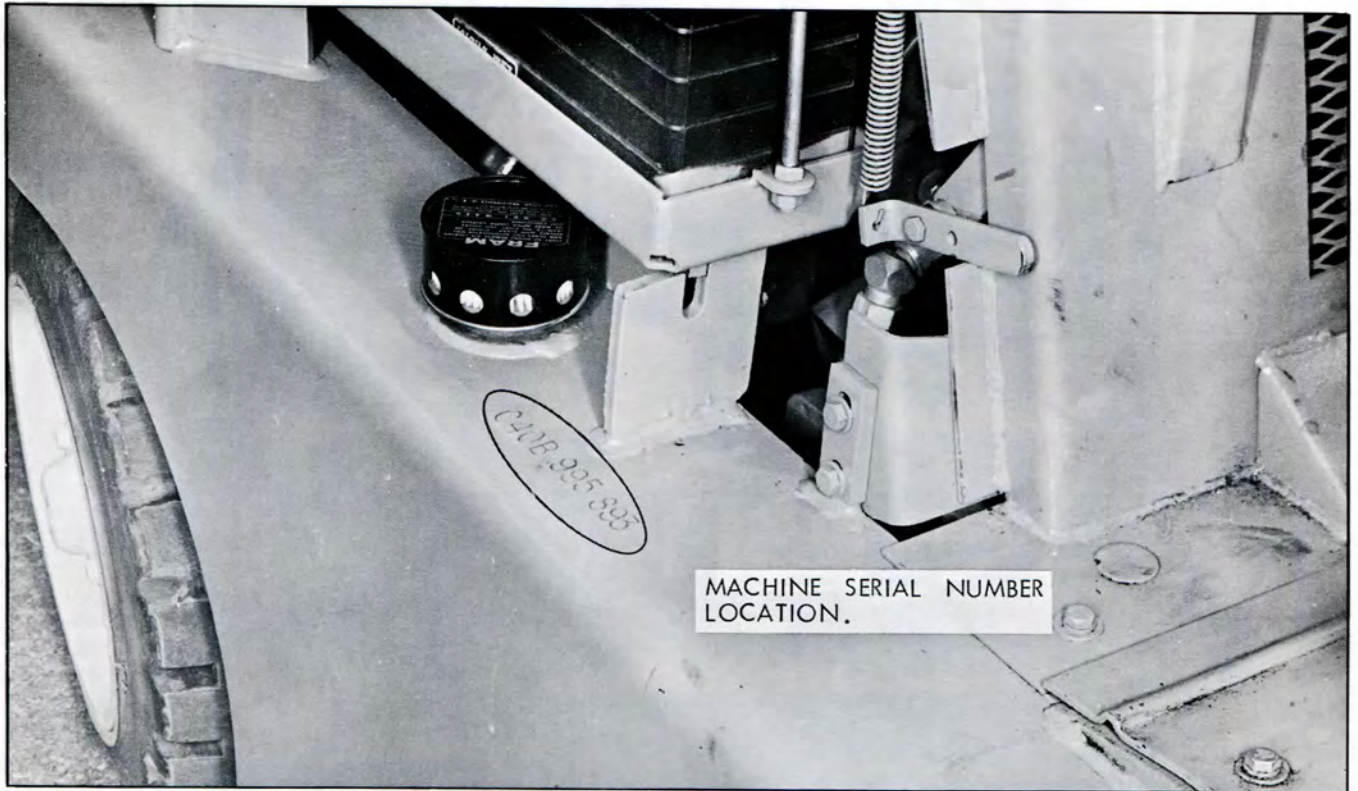


Plate 9474. Machine Serial No. Location

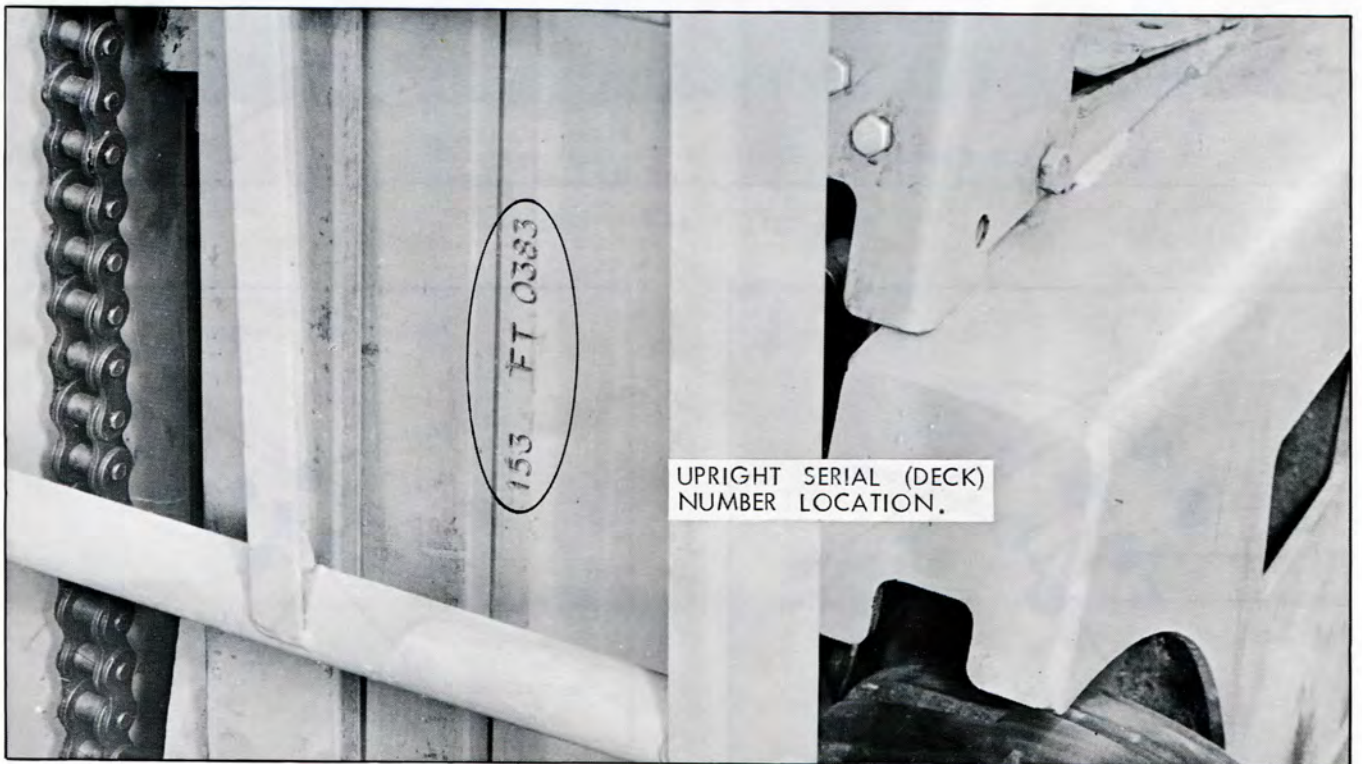


Plate 9475. Upright Serial (Deck) No. Location

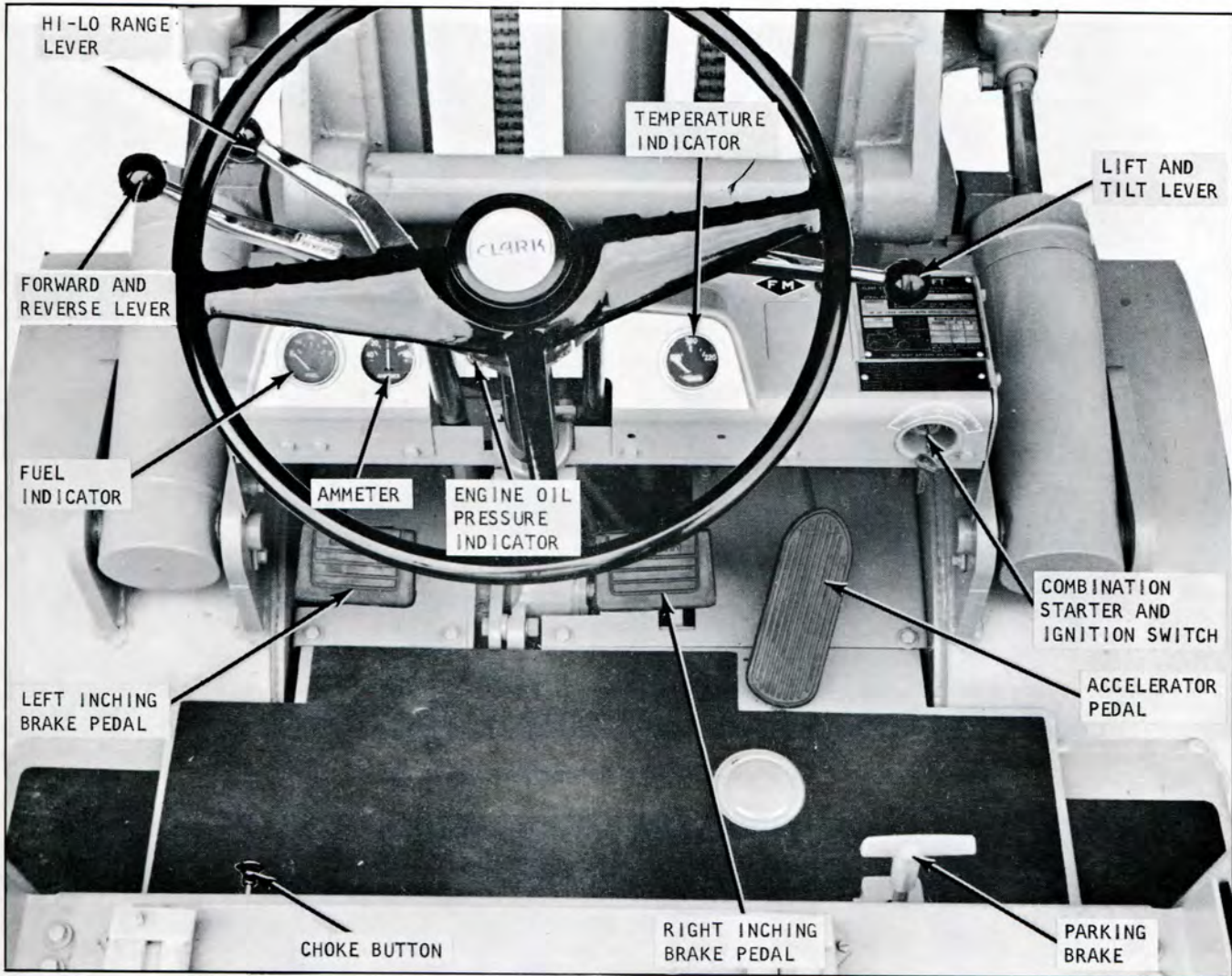


Plate 7229. Overall Controls

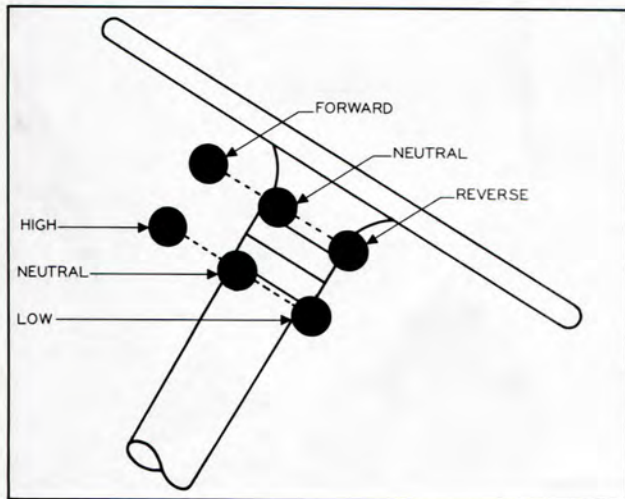


Plate 4548. Directional Control Levers

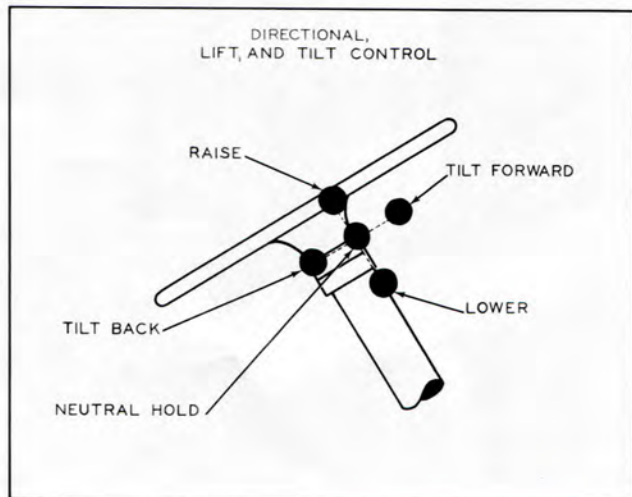


Plate 4448. Hydraulic Control Lever



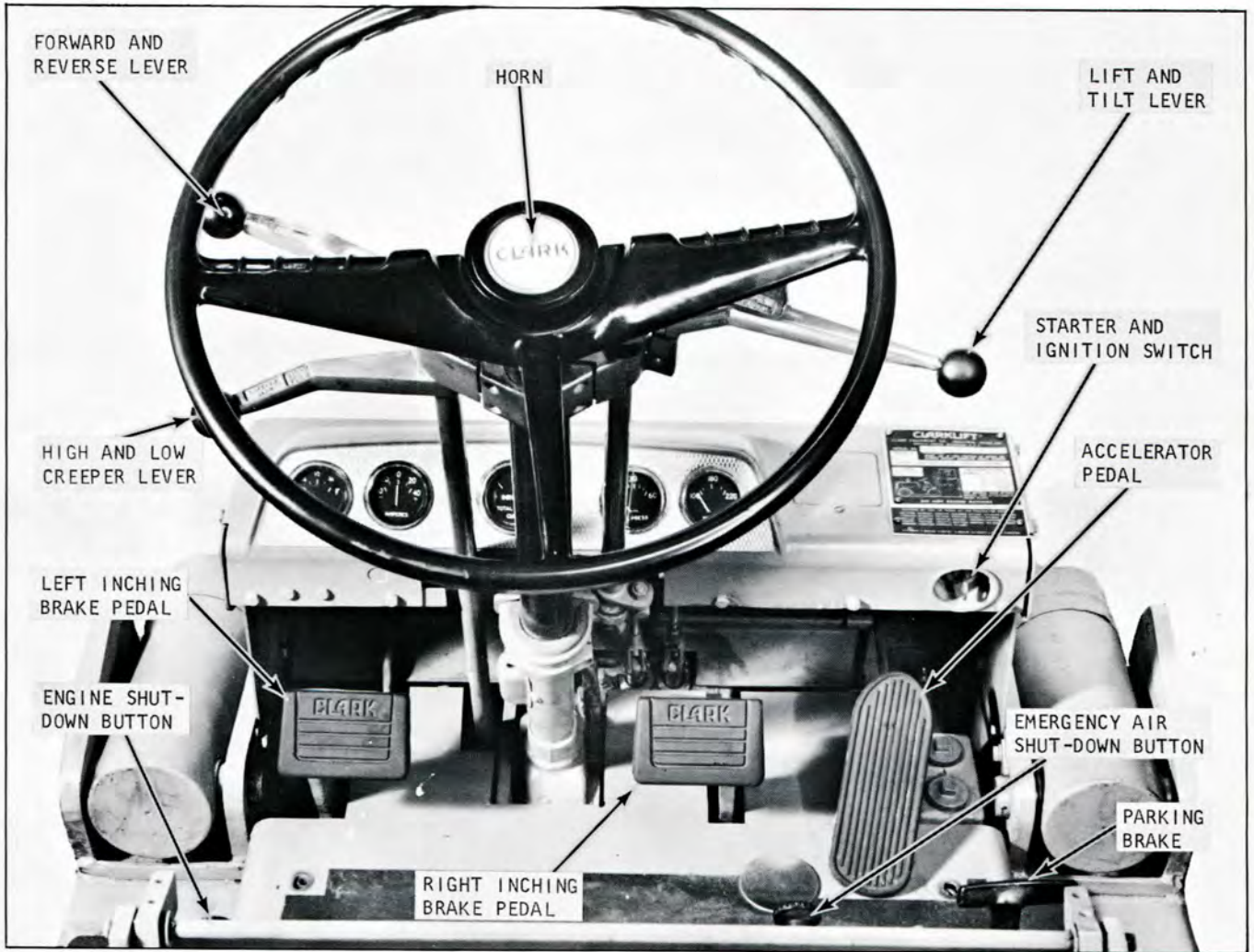


Plate 8605. Overall Controls

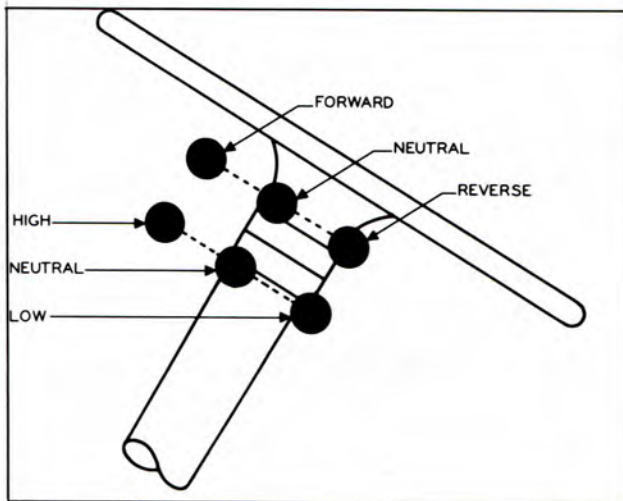


Plate 4548. Directional Control Levers

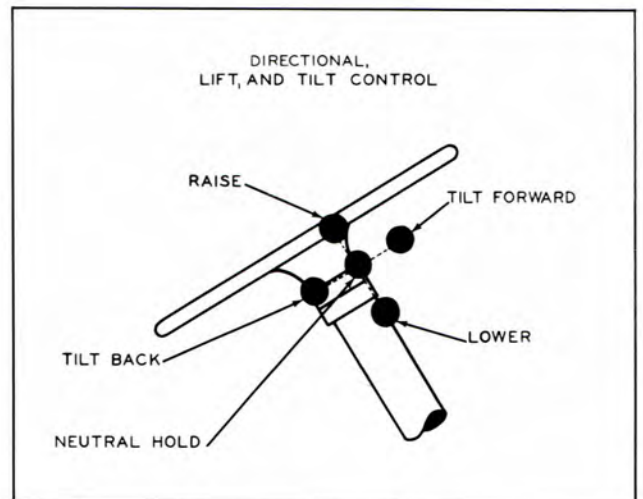
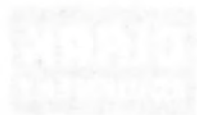


Plate 4448. Hydraulic Control Lever



# INDUSTRIAL TRUCK DIVISION



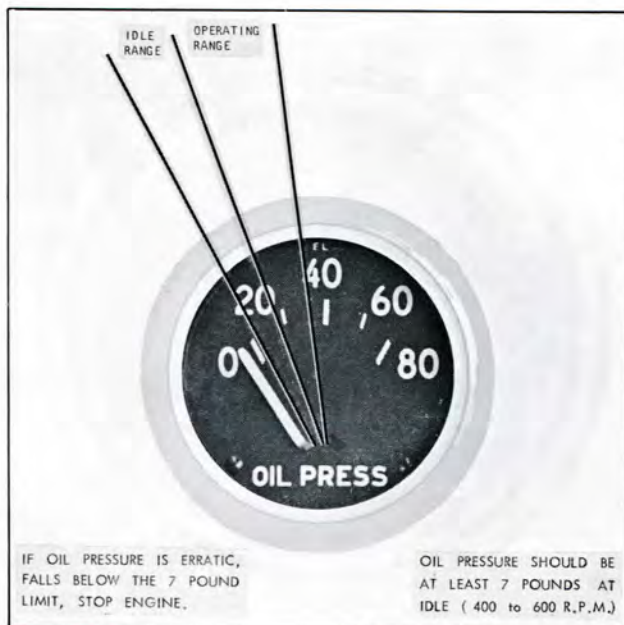


Plate 6288. Oil Pressure Indicator  
(MACHINES SO EQUIPPED)



Plate 6885. Oil Pressure Warning Light  
(MACHINES SO EQUIPPED)

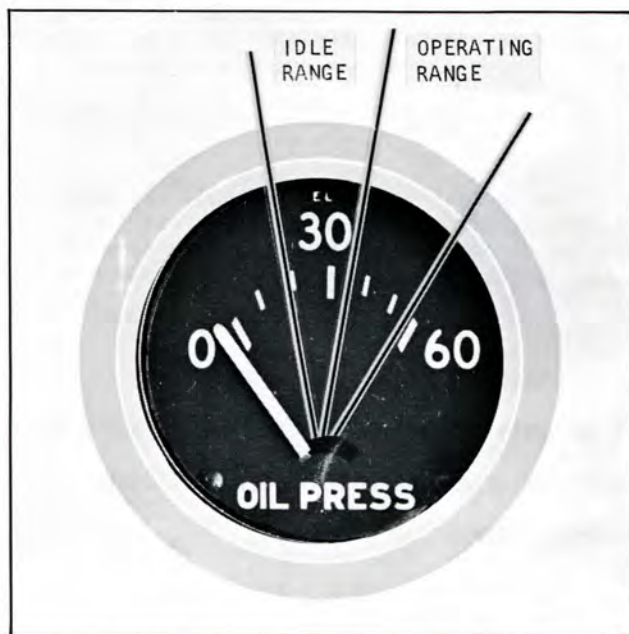


Plate 8606. Oil Pressure Indicator  
(MACHINES SO EQUIPPED)

a. Oil Pressure Indicator. Select the gauge in your machine. Your machine engine oil pressure should read as marked in the illustration.

**CAUTION**

IF OIL PRESSURE WARNING LIGHT COMES ON, STOP THE ENGINE IMMEDIATELY AND FIND THE CAUSE OF THE TROUBLE. REFER TO TROUBLE SHOOTING SECTION FOR THIS INFORMATION. IF THE OIL PRESSURE IS ERRATIC OR FALLS BELOW THE ABOVE LIMIT, STOP THE ENGINE IMMEDIATELY AND FIND THE CAUSE OF THE TROUBLE. REFER TO TROUBLE SHOOTING SECTION FOR THIS INFORMATION. ON NEW MACHINES, AFTER STARTING ENGINE, RUN IT AT IDLE FOR FIVE MINUTES, THEN STOP ENGINE AND RECHECK OIL LEVEL IN CRANKCASE. BRING OIL LEVEL TO HIGH MARK, IF NECESSARY.

**NOTE**

Before placing machine in operation, run engine a few minutes to warm oil especially in cold operating conditions.

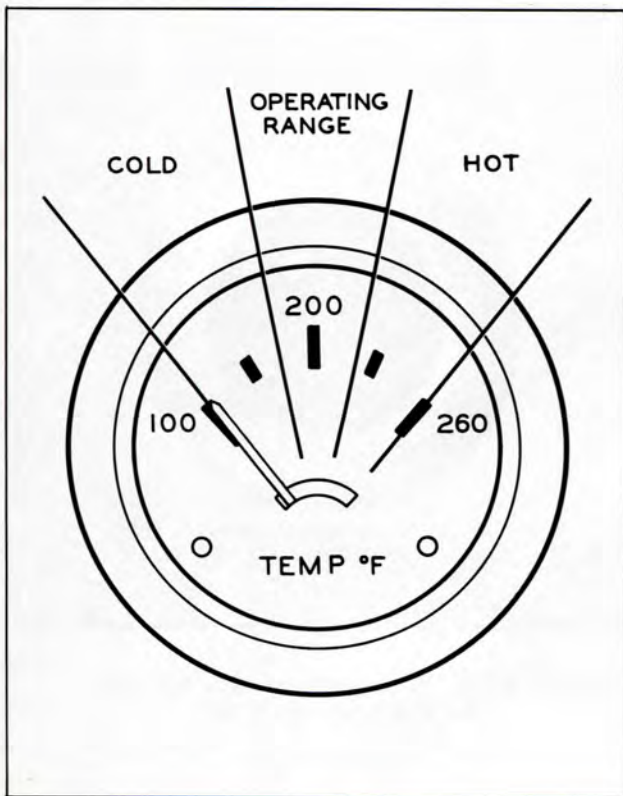


Plate 8288. Engine Coolant Temperature Indicator

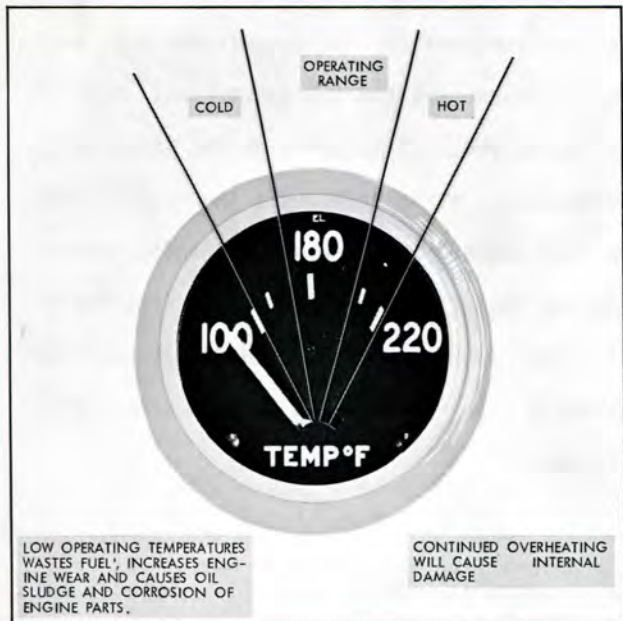


Plate 6287. Engine Coolant Temperature Indicator



Plate 7162. Hour Meter

The hour meter accurately records the actual hours of machine operation. This will serve as an aid in determining the time intervals for lubrication and preventive maintenance services.

**NOTE**

The coolant temperature should register in the operating range after the first few minutes of operation. Low operating temperatures wastes fuel and increases engine wear.

**CAUTION**

DO NOT IDLE THE ENGINE FOR LONG PERIODS AS IT IS NOT ONLY DETRIMENTAL TO THE ENGINE BUT ALSO INCREASES OPERATING COSTS AS YOU ARE USING FUEL WITHOUT BENEFIT.

**NOTE**

Select the indicator in your machine. Coolant temperatures should read as marked, except for diesel equipped machines.

DIESEL MACHINES: REFER TO DIESEL OPERATORS MANUAL FOR COOLANT TEMPERATURES.

## OPERATIONS



Plate 6418. Ignition Switch

## STARTING

Place all transmission control levers in neutral position. Pull out on choke and engage the starter by actuating the ignition switch in the start position.

## CAUTION

DO NOT ENGAGE THE STARTER LONGER THAN 15 SECONDS WITHOUT A MINUTE OR SO INTERVAL BETWEEN TRIALS.

If the engine becomes overchoked or flooded; push choke button in, depress accelerator pedal fully and engage starter. If all necessary equipment is in correct working order, the engine will start.

After engine has started, check instrument panel making certain the engine oil pressure indicator shows adequate pressure. If no oil pressure is indicated, stop engine and correct the difficulty.

## NOTE

RUN ENGINE A FEW MINUTES TO WARM OIL, BEFORE PUTTING MACHINE TO WORK ESPECIALLY IN COLD OPERATING CONDITIONS.

## TO OPERATE MACHINE

1. Place Transmission control levers in neutral position and start engine.
2. Move Hi and Lo range lever for desired speed.
3. Now move forward and reverse lever out of neutral and into position for desired direction. Accelerate as required.
4. Inching Operation: To inch the machine into a load, the brake pedal should be depressed in its free travel range and the accelerator pedal actuated as required. The initial brake movement is used to regulate the inching control valve which allows a decrease in pressure on the transmission selector pack discs. This permits controlled slippage of the discs allowing the machine to inch - - - after the brake pedal travel has actuated the inching valve mechanism the brake become applied and all pressure by-passes the selector discs.

## CAUTION

TO PROLONG MACHINE LIFE IT IS BEST TO COME TO A COMPLETE STOP BEFORE SHIFTING TO THE OPPOSITE DIRECTION.

ALLOW FOOT TO REST ON BRAKE PEDAL ONLY WHEN INCHING IS DESIRED. DO NOT ALLOW FOOT TO REST ON BRAKE PEDAL WHILE DRIVING MACHINE FROM POINT TO POINT. RIDING THE BRAKE PEDAL WILL CAUSE CONTINUED SLIPPAGE OF THE TRANSMISSION SELECTOR PACKS RESULTING IN OVERHEATING AND UNNECESSARY WEAR OR DAMAGE TO TRANSMISSION COMPONENTS.

## TO STOP MACHINE

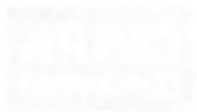
Remove foot from accelerator pedal and depress brake pedal. If machine is to be parked, place transmission control levers in neutral position, apply hand brake and shut engine off.

## CAUTION

IF THE ENGINE HAS BEEN OPERATING AT OR NEAR FULL LOAD, IT SHOULD BE ALLOWED TO RUN AT FAST IDLE (600 to 800 R.P.M.) FOR ONE OR TWO MINUTES AFTER LOAD IS REMOVED BEFORE BEING STOPPED. THIS ALLOWS INTERNAL ENGINE TEMPERATURES TO EQUALIZE.



# INDUSTRIAL TRUCK DIVISION



## OUR QUALITY

The quality of our products is a result of the care and attention given to every detail of our manufacturing process. We use only the finest materials and employ the most skilled craftsmen to ensure that every truck we produce meets the highest standards of performance and reliability.

Our trucks are designed for maximum efficiency and durability, allowing you to get the most out of your investment. Whether you need a truck for material handling, transport, or specialized applications, we have the solution for you.

At the Industrial Truck Division, we are committed to providing you with the best products and service possible. Contact us today to learn more about our wide range of industrial trucks and how we can help you improve your productivity.



Our trucks are built to last, with a focus on long-term value. We offer a variety of models to suit different needs and budgets, ensuring that you can find the right truck for your application.

Our commitment to quality is reflected in our comprehensive warranty and support programs. We provide the training and resources you need to get the most out of your truck, and we are always available to assist you with any questions or concerns.

At the Industrial Truck Division, we are dedicated to helping you work smarter and more efficiently. Contact us today to explore the possibilities.

Our trucks are designed for maximum efficiency and durability, allowing you to get the most out of your investment. Whether you need a truck for material handling, transport, or specialized applications, we have the solution for you.

At the Industrial Truck Division, we are committed to providing you with the best products and service possible. Contact us today to learn more about our wide range of industrial trucks and how we can help you improve your productivity.

Our trucks are built to last, with a focus on long-term value. We offer a variety of models to suit different needs and budgets, ensuring that you can find the right truck for your application.

Our commitment to quality is reflected in our comprehensive warranty and support programs. We provide the training and resources you need to get the most out of your truck, and we are always available to assist you with any questions or concerns.

At the Industrial Truck Division, we are dedicated to helping you work smarter and more efficiently. Contact us today to explore the possibilities.

Our trucks are designed for maximum efficiency and durability, allowing you to get the most out of your investment. Whether you need a truck for material handling, transport, or specialized applications, we have the solution for you.

At the Industrial Truck Division, we are committed to providing you with the best products and service possible. Contact us today to learn more about our wide range of industrial trucks and how we can help you improve your productivity.



# INDUSTRIAL TRUCK DIVISION



## OPERATIONS

### DIESEL ENGINE COLD WEATHER STARTING AID

To assist in starting an engine under low temperature conditions, a Spray Priming System is provided. Instructions for operation of the system are as follows:

Push actuator button a full stroke while counting to five (equivalent to five seconds), and release. DO NOT PRE-LOAD THE ENGINE WITH STARTING FLUID. If engine falters after starting, depress the actuator button a partial stroke to provide injection of a minute amount of fluid to affect smoother engine operation--- inject additional fluid only when necessary to keep the engine running ---- starting procedure may be modified to use longer or shorter injection period depending on weather conditions, etc. The Spray Priming System cannot be used after the engine has reached operating temperature.

#### To Install A New Can Of Starting Fluid.

The handle of the main unit should be pulled all the way up and the can pulled straight down and then removed. A new can may be inserted after first removing the cap and spray button. It should be installed in as nearly a vertical position as possible, lifting with a light twisting motion in order to have the stem of the can inserted into the "O" ring seal ----DO NOT FORCE. Push handle down into position and the Spray Priming System is ready for use again.

### NOTE

A Spray Starting Fluid Can, FULL OR EMPTY, should always be in place (installed in the spray system) to prevent drawing dust and dirt into the spray nozzle.

### WARNING

THE STARTING FLUID IS TOXIC AND INFLAMMABLE.

EXERCISE CAUTION WHEN HANDLING.

(A) BATTERY CURRENT SHUT-OFF SWITCH

This switch is provided so that the batteries can be completely disconnected from the electrical circuits, thereby eliminating the possibility of the battery discharging in the event of short circuits.

(B) EMERGENCY STOP KNOB

In an emergency, or if after pulling the engine stop knob the engine continues to operate, the emergency stop knob may be pulled to stop the engine. The emergency stop knob, when pulled, will trip the air shut-down valve located between the air inlet housing and the blower and shut off the air supply to the engine. Lack of air will prevent further combustion of the fuel and stop the engine.

The emergency stop knob must be pushed back in after the engine stops so the air shut-down valve can be opened (Plate 8607) for re-starting after the malfunction has been corrected.

(C) STOP KNOB

A stop knob is used on most applications to shut the engine down. When stopping an engine, the speed should be reduced to idle and the engine allowed to operate at idle for a few minutes to permit the coolant to reduce the temperature of the engine's moving parts. Then, the stop knob should be pulled and held until the engine stops. Pulling on the stop knob manually places the injector racks in the "no-fuel" position. The stop knob should be returned to its original position after the engine stops.

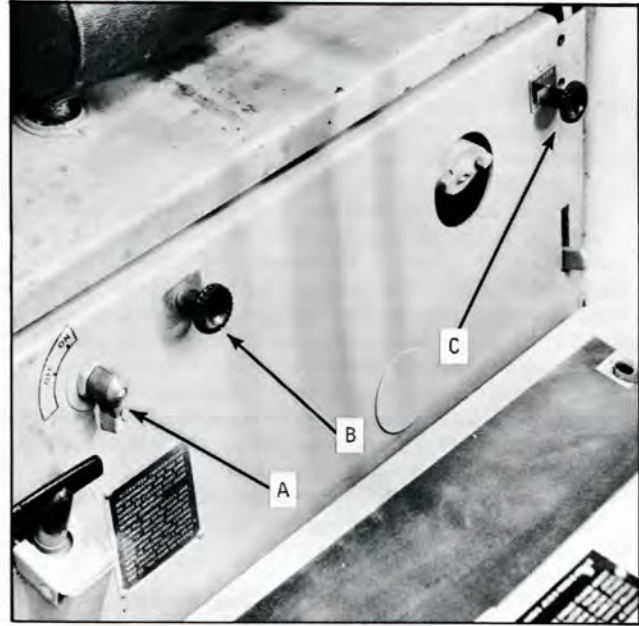


Plate 8608. Battery and Engine Shut-off

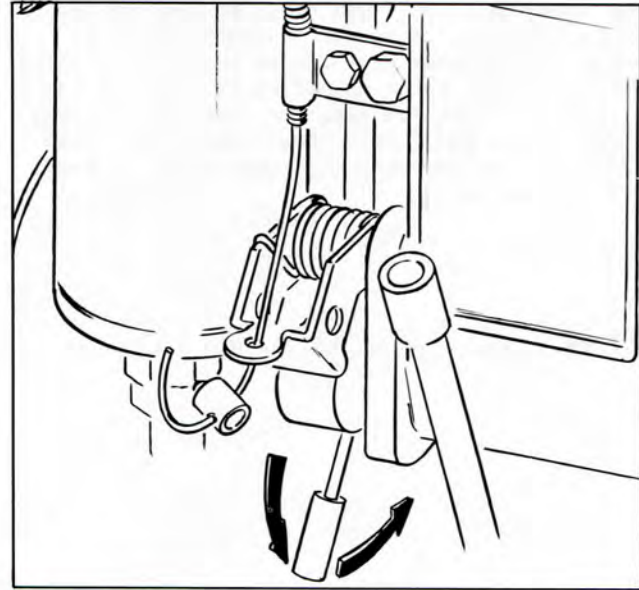


Plate 8607. Air Shut-Down Valve Latch



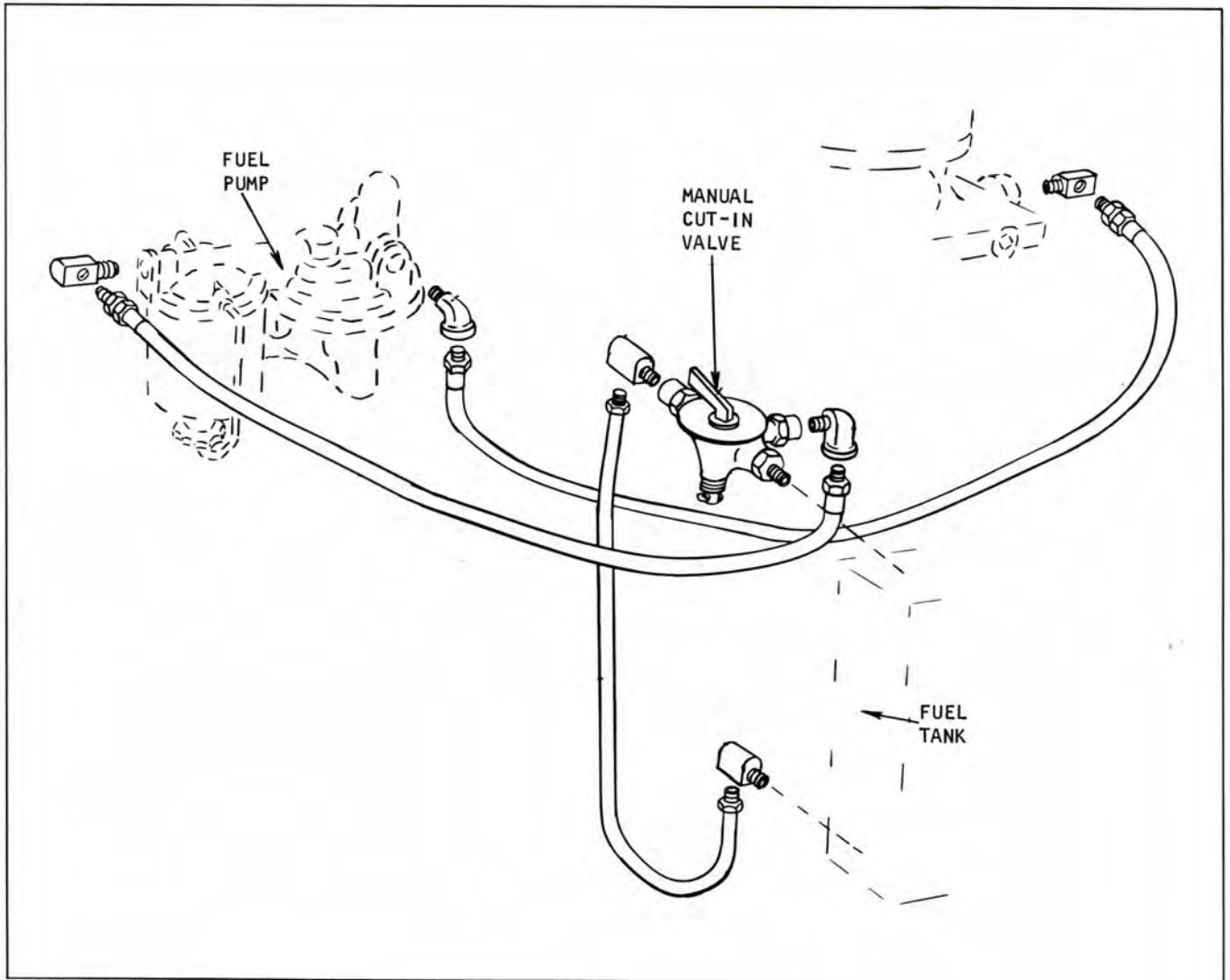
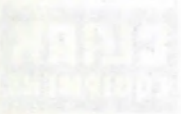


Plate 7236. Manual Cut-in Valve

The auxiliary fuel reserve manual cut-in valve located at the fuel tank may be turned to the auxiliary position in the event that the main fuel tank supply becomes exhausted. The reserve fuel supply of approximately 1/2 gallon will in most

cases be adequate to allow the machine to be driven to its refueling location. After the fuel supply has been replenished the manual cut-in lever should be turned to the normal position.

(ON MACHINES SO EQUIPPED)



# INDUSTRIAL TRUCK DIVISION

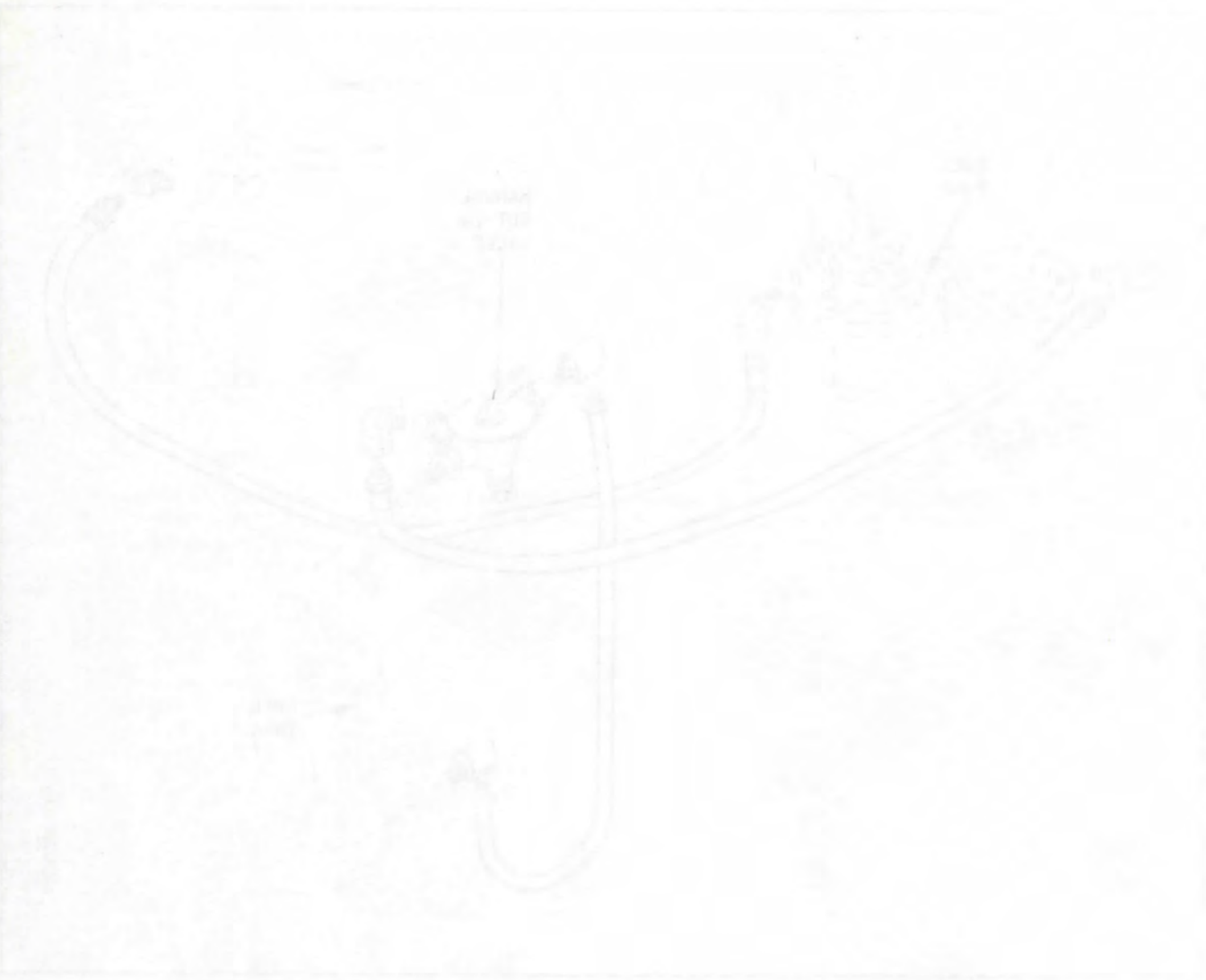


Diagram of Hydraulic System

The hydraulic system is designed to provide power to the steering and suspension components of the industrial truck. It consists of a pump, a reservoir, and various valves and hoses that control the flow of hydraulic fluid to the actuators.

The system is capable of operating at pressures up to 1000 psi. It is designed to be easy to maintain and repair, with all components accessible from the operator's seat.

Diagram of Electrical System



# INDUSTRIAL TRUCK DIVISION



## OPERATIONS

### To Move A Load.

The forks should be adjusted sidewise on the fork bars to obtain firm support and maximum balance of the load. Raise or lower the forks to the proper level and engage the load by driving forward. Tilt the upright backward sufficiently to adequately cradle the load, and raise load sufficiently to clear obstructions, accelerating engine slightly at the same time. Back away from stack.

The operator should have clear vision ahead when moving in a forward direction. When this is not possible, the operator should drive in reverse and turn in his seat to obtain clear vision backward.

When the load is to be deposited, enter the area squarely, especially when placing one load on top of another, in order that all piles will be square and secure. Place load directly over desired area and slowly lower into position. Disengage forks from the load by using necessary lift-tilt and then back away.

Loads will vary in size, shape, method of packaging, stacking procedures, etc. The best way to handle a load will depend on these factors. If in doubt, consult with your supervisor.

### I M P O R T A N T

EVERY 8 OPERATING HOURS (OR EVERY SHIFT) ELEVATE UPRIGHT TO THE UPPER LIMIT. THIS WILL PROVIDE LUBRICATION TO THE TOP PORTION OF THE LIFT CYLINDER. CHECK FOR NORMAL SEQUENCE OF OPERATION.

### OPERATING SAFETY RULES AND PRACTICES.

1. Operators of powered industrial trucks should be physically qualified. An examination should be made on an annual basis and include such things as field of vision, hearing, depth perception and reaction timing.

2. Only trained and authorized operators should be permitted to operate a powered industrial truck. Methods should be devised to train operators in the safe operation of powered industrial trucks. It is recommended that badges or other visual indication of the operator's authorization should be displayed at all times during work period.

### GENERAL.

1. Safeguard the pedestrians at all times. Do not drive a truck up to anyone standing in front of a bench or other fixed object.

2. Do not allow anyone to stand or pass under the elevated portion of any truck, whether loaded or empty.

3. Unauthorized personnel should not be permitted to ride on powered industrial trucks. A safe place to ride should be provided where riding of trucks is authorized.

4. Do not put arms or legs between the uprights of the mast or outside the running lines of the truck.

5. When leaving a powered industrial truck unattended, load engaging means should be fully lowered, controls should be neutralized, power shut off, brakes set, key or connector plug removed. Block wheels if truck is parked on an incline.

6. Maintain a safe distance from the edge of ramps or platforms and do not, while on any elevated dock or platform, push freight cars. Do not use trucks for opening or closing freight doors.

7. Have brakes set and wheel blocks in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semi-trailer during loading or unloading when the trailer is not coupled to a tractor. Check the flooring of trucks, trailers, and railroad cars for breaks and weakness before driving onto them.

8. Be sure of sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.

9. Use an Overhead Guard and Load Backrest Extension unless conditions prevent their use.

```

x x x x x x x x x x x x x x x x x x x x x x x x x x
x
x           W A R N I N G           x
x
x AN OVERHEAD GUARD IS INTENDED TO OFFER PROTECTION FROM THE IMPACT OF SMALL PACKAGES, BOXES, BAGGED MATERIAL, ETC., REPRESENTATIVE OF THE JOB APPLICATION, BUT NOT TO WITHSTAND THE IMPACT OF A FALLING CAPACITY LOAD.
x
x x x x x x x x x x x x x x x x x x x x x x x x x x

```

10. Use only approved industrial trucks in hazardous locations.



# INDUSTRIAL TRUCK DIVISION



## OPERATIONS

11. Elevate personnel only on an approved safety platform firmly secured to the lifting carriage and/or forks.
12. Report all accidents involving personnel, building structures, and equipment.
13. Fire aisles, access to stairways, and fire equipment should be kept clear.

### TRAVELING.

1. Observe all traffic regulations including authorized plant speed limits. Under normal traffic conditions, keep to the right. Maintain a safe distance, approximately three truck lengths from the truck ahead, and keep the truck under control at all times. Use of truck on public roads should conform to local traffic regulations.
2. Yield the right of way to ambulances, fire trucks, or other vehicles in emergency situations.
3. Do not pass another truck traveling in the same direction at intersections, blind spots, or at other dangerous locations.
4. Slow down and sound horn at cross aisles and other locations where vision is obstructed. If the load being carried obstructs forward view travel with the load trailing.
5. Cross railroad tracks diagonally wherever possible. Do not park closer than 8 feet from center of railroad tracks.
6. Look in the direction of, and keep a clear view of the path of travel.
7. Ascend or descend grades slowly.

When ascending or descending grades in excess of 10%, loaded trucks should be driven with the load upgrade.

Unloaded trucks should be operated on all grades with the load engaging means downgrade.

On all grades the load and load engaging means should be tilted back if applicable, and raised only as far as necessary to clear the road surface.

8. Under all travel conditions the truck should be operated at a speed that will permit it to be brought to a stop in a safe manner.
9. Travel with load engaging means or load low and, where possible, tilted back. Do not elevate the load except during stacking.
10. Make starts, stops, turns or direction reversals in a smooth manner so as not to shift load and/or overturn the truck.

11. Stunt driving and horseplay should not be permitted.
12. Slow down for wet and slippery floors.
13. Before driving over a dockboard or bridgeplate, be sure that it is properly secured. Drive carefully and slowly across the dockboard or bridgeplate and never exceed its rated capacity.
14. Do not run vehicles onto any elevator unless specifically authorized to do so. Approach elevators slowly, and then enter squarely after the elevator car is properly leveled. Once on the elevator, neutralize the controls, shut off power, and set brakes. It is advisable that all personnel leave the elevator before a truck is allowed to enter or leave.
15. Avoid running over loose objects on the roadway surface.

### LOADING.

1. Handle only stable or safely arranged loads. When handling off-center loads which cannot be centered, operate with caution.
2. Handle only loads within the rated capacity of the truck.
3. Adjust for long or high (including multiple tiered) loads which may affect capacity.
4. When attachments are used, particular care should be taken in securing, manipulating, positioning, and transporting the load. Operate trucks equipped with attachments as partially loaded trucks when not handling a load.
5. Place load engaging means under the load as far as possible and carefully tilt the mast backward to stabilize the load. Caution should be used in tilting backward with high or segmented loads.
6. Use extreme care when tilting load forward or backward particularly when high tiering. Do not tilt forward with load engaging means elevated except to pick up a load. Do not tilt an elevated load forward except when the load is in a deposit position over a rack or stack. When stacking or tiering use only enough backward tilt to stabilize the load.

### OPERATOR CARE OF THE TRUCK.

1. Give special consideration to the proper functioning of tires, horn, lights, battery, controller, lift system (including load engaging means, chains, cable, and limit switches), brakes and steering mechanism. If at any time



# INDUSTRIAL TRUCK DIVISION



## OPERATIONS

### OPERATOR CARE OF THE TRUCK (CONT.).

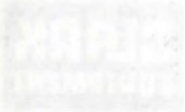
a powered industrial truck is found to be in need of repair, defective, or in any way unsafe, the matter should be reported immediately to the designated authority, and the truck should be taken out of service until it has been restored to safe operating condition.

2. Do not make repairs or adjustments unless specifically authorized to do so.
3. Do not fill fuel tanks while engine is running and avoid spillage.
4. Spillage of oil or fuel should be carefully washed away or completely evaporated and fuel tank cap replaced before restarting engine.
5. Do not operate a truck with a leak in the fuel system until the leak has been corrected.
6. Do not use open flames for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

### NOTE

The preceding is reproduced from:

American National Standard ... Safety Standard  
for Powered Industrial Trucks. B56.1 - 1969



# INDUSTRIAL TRUCK DIVISION



The following information is for your information only. It is not intended to constitute an offer of insurance or any other financial product. Please contact your insurance agent for more information.

This policy is subject to the terms, conditions, coverages, exclusions, and limitations set forth in the policy contract.

The policy is issued to the named insured and is not assignable without the written consent of the insurer.

The policy is issued on the basis of the information provided by the insured. Any misstatement or omission of material facts may result in the policy being voided.

The policy is issued for the term of one year, unless otherwise specified.

The policy is issued in accordance with the provisions of the policy contract.

The undersigned hereby certifies that the information provided herein is true and correct to the best of their knowledge and belief.

Signature: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

FUEL HANDLING AND STORAGE SAFETY

## Liquefied Petroleum Gas Fuel (LPG Powered Trucks)

1. The storage and handling of liquefied petroleum gas (LP-Gas) should be in accordance with the Standard for Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58, USA Standard Z106.1-1965).
2. Trucks using LP-Gas should be refueled only at locations designated for that purpose. Safe outdoor locations are preferable to indoor. Trucks should be refueled as provided in the Standard for the Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58, USA Standard Z106.1-1965).
3. Reasonable care should be exercised in handling of LP-Gas containers to avoid damage. Do not drop, throw, roll, or drag LP-Gas containers or any associated parts of the containers or fuel systems.
4. Do not over-fill LP-Gas containers.
5. Engine should be stopped and operator off the truck during refueling.
6. Trained and designated personnel should recharge or exchange LP-Gas containers.
7. Personnel engaged in recharging of LP-Gas containers should wear protective clothing such as face shield, long sleeves, and gauntlet gloves.
8. Never use a match or flame to check for leaks, use a soap solution.
9. LP-Gas powered trucks should not be refueled nor stored near underground entrances, elevator shafts nor any other place where LP-Gas could collect in a pocket causing a potentially dangerous condition.
10. Trucks equipped with permanently mounted LP-Gas containers should be refueled outdoors.
11. Exchange of removable LP-Gas containers preferably should be done outdoors, but may be done indoors. Means should be provided in the fuel system to minimize the escape of fuel when the containers are exchanged. This should be accomplished by either of the following methods:
  - A. Using an automatic quick closing coupling (a type closing in both directions when uncoupled) in the fuel line, or.....
  - B. Closing the valve at the LP-Gas container and allowing the engine to run until the fuel in the line is consumed.
12. When installing removable LP-Gas containers they should be so located on the truck that the safety pressure relief valve opening is always in contact with the vapor space (top) of the cylinder. This is accomplished by an indexing pin which, when the tank is properly installed, positions the container.
13. All reserve LP-Gas containers should be stored and transported with the service valve closed. Safety relief valves should have direct communication with the vapor space of the container at all times.
14. The careless handling of LP-Gas containers can result in a serious accident. Extreme care should be exercised when transporting containers so that they are not accidentally dropped or physically damaged. When it is necessary to move more than one container at one time, a proper carrying device should be provided.
15. Physical damage such as dents, scrapes, or gouges, may materially weaken the structure of the LP-Gas container and render it unsafe for use. All LP-Gas containers should be examined before recharging and again before reuse, for the following defects or damage:
  - A. Dents, scrapes, and gouges of the pressure vessel.
  - B. Damage to the various valves and liquid level gage.
  - C. Debris in the relief valve.
  - D. Indications of leakage at valves or threaded connections.
  - E. Deterioration damage or loss of flexible seals in the fill or servicing connections.All defective or damaged LP-Gas containers should be removed from service.
16. Smoking should be prohibited in the refueling area.
17. Whenever vehicles using LP-Gas as a fuel are parked overnight or stored for protracted periods of time indoors, with the fuel container in place, the service valve on the fuel container should be closed.

When checking or adjusting L.P. Gas equipment be sure to:

1. Properly ventilate work area.
2. Eliminate ignition sources (sparks, pilot lights etc.).
3. Prohibit smoking.
4. Have fire fighting equipment present.
5. Check all equipment, lines, connections with soapy water. NEVER USE A MATCH

OR FLAME WHEN CHECKING FOR LEAKS.

6. Check cylinder (container) for security of mounting.

7. Inspect hoses, grommets or whatever means is used to protect hoses from damage where they run through sheet metal etc. Replace any component that is unfit for further service.

8. Check all equipment for security of mounting.

9. Check the Solenoid Lock-Off Valve to be sure it is working. Upon turning off the ignition switch there should be an audible click indicating the valve has actuated shutting off the fuel flow at the valve. The valve should not open again until the ignition switch is turned on and the engine cranked. Cranking the engine provides oil pressure to the engine oil pressure sending unit which actuates completing an electrical circuit to the solenoid lock-off valve. The valve then opens allowing the L.P. Gas to pass through.

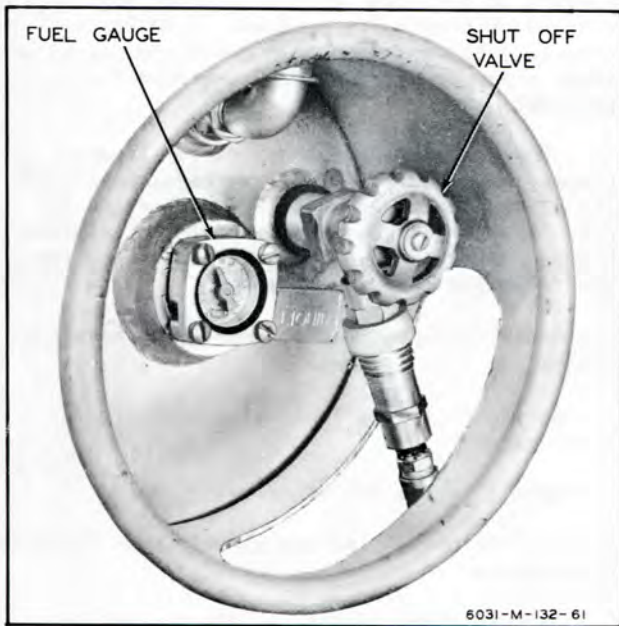


Plate 6031. Typical L.P. Gas Container



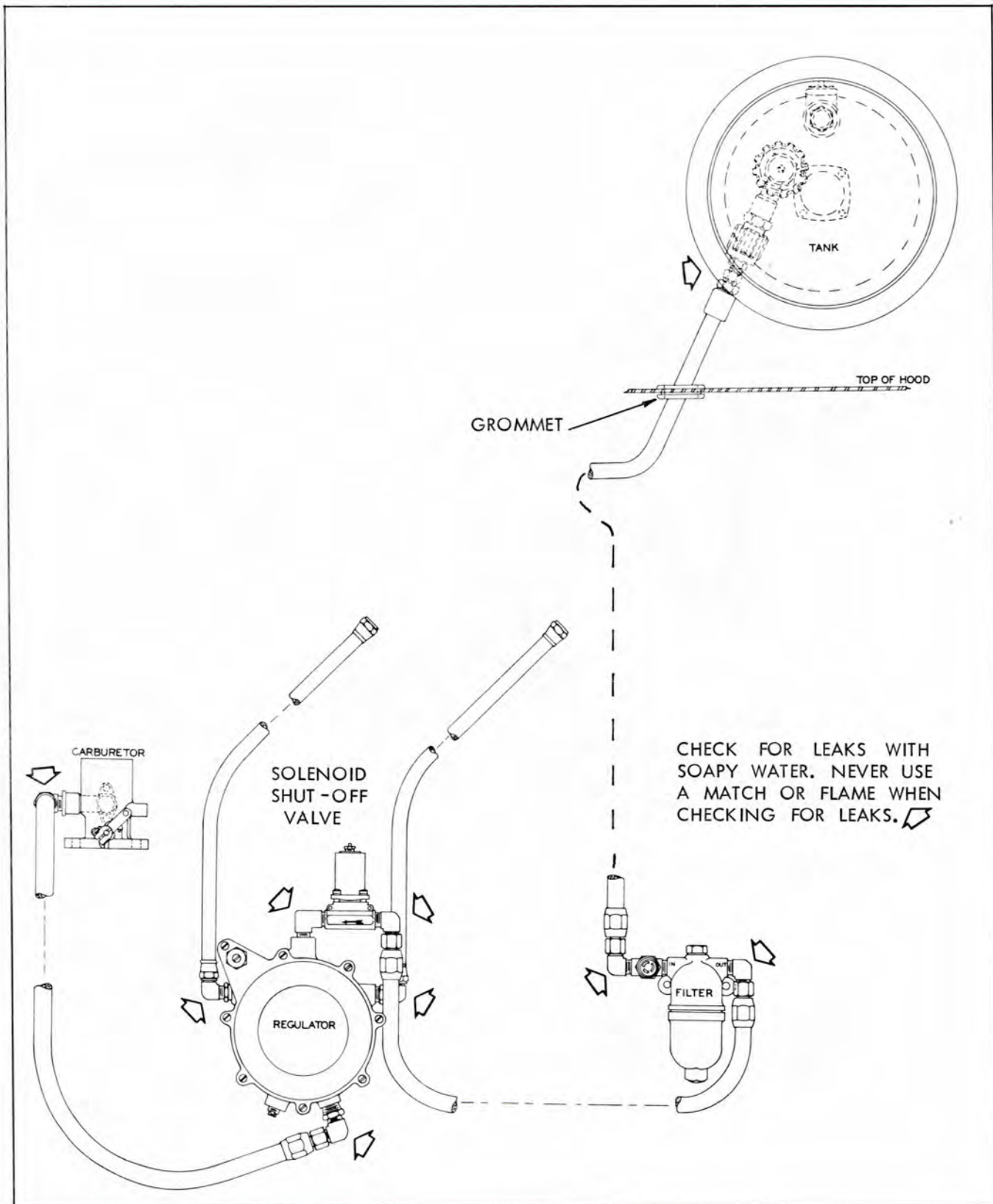


Plate 7405. Typical L.P. GAS Installation

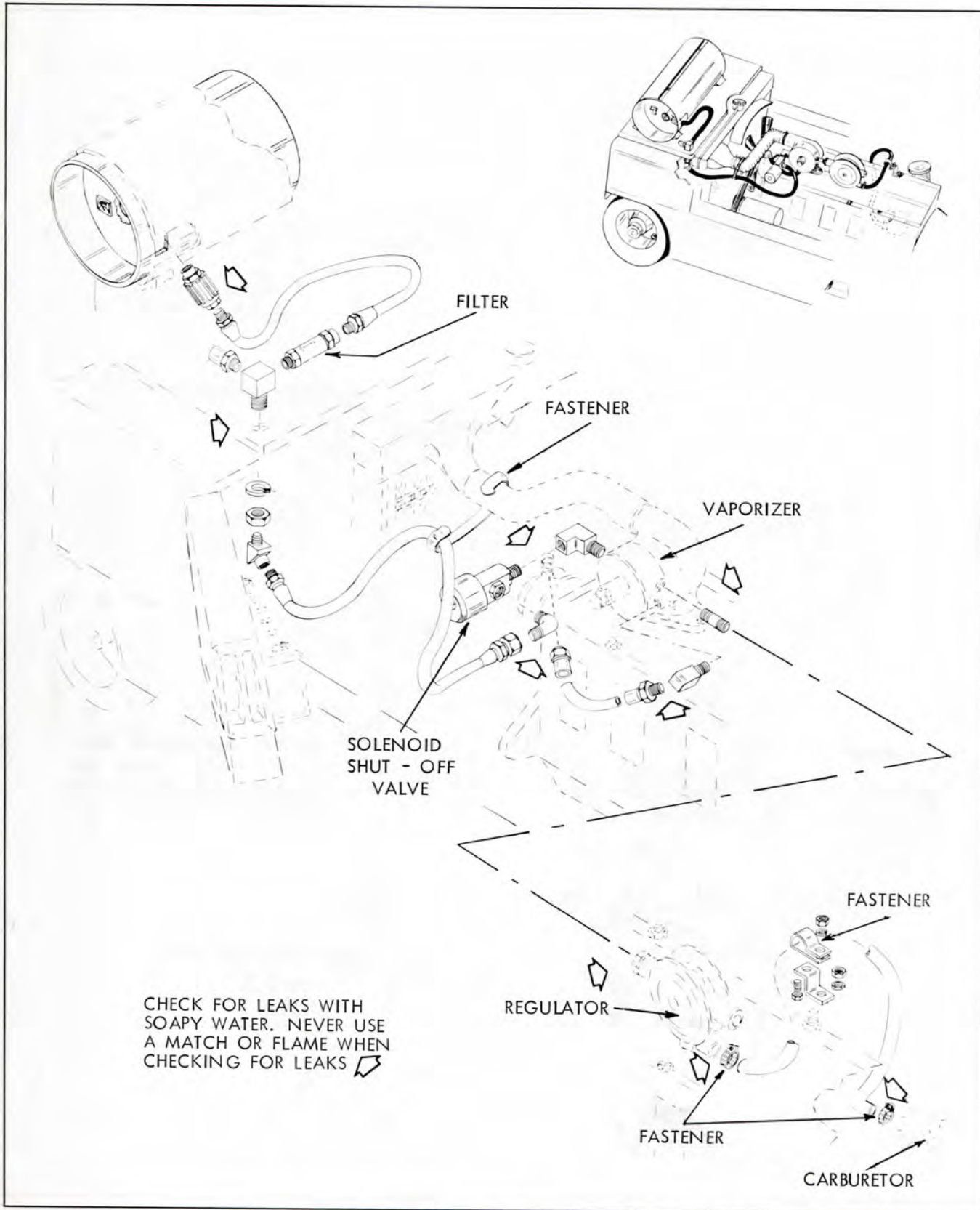


Plate 7406. Typical L.P. GAS Installation



# INDUSTRIAL TRUCK DIVISION



## FUEL HANDLING AND STORAGE SAFETY

(Gasoline Powered Trucks)

### Liquid Fuels. (Such as Gasoline and Diesel Fuel).

1. The storage and handling of liquid fuels should be in accordance with the Flammable and Combustible Liquids Code. (NFPA No. 30).
2. Trucks using liquid fuels should be refueled only at locations designated for that purpose. Safe outdoor locations are preferable to those indoors. The Flammable and Combustible Liquids Code (NFPA No. 30), Paragraph 7211, outlines recommendations for arranging safe indoor fueling facilities.
3. Engines should be stopped and operator off the truck during refueling.
4. Liquid fuels not handled in approved dispensing pumps should be transported in safety cans. Safety cans should be inspected regularly for damage to closures and for leaks; faulty cans repaired or replaced. Care should be exercised in handling of safety cans to avoid damage.
5. Reasonable care should be exercised to prevent the spillage of fuel or overfilling either the vehicle fuel tanks or safety cans. Filler cap should be replaced and any spilled fuel disposed of by using a noncombustible adsorbent before the engine is restarted.
6. Smoking should be prohibited in the refueling area.



INDUSTRIAL TRUCK DIVISION



The undersigned hereby certifies that the  
 information furnished herein is true and correct  
 to the best of his knowledge and belief.  
 I am a duly authorized representative of the  
 Industrial Truck Division of the General Motors  
 Corporation, and I am authorized to execute  
 this certificate on behalf of the Industrial Truck  
 Division.



# INDUSTRIAL TRUCK DIVISION



## LUBRICATION AND PREVENTIVE MAINTENANCE INDEX

### (8 Hours)

	Time Interval & Number (H=Hours)	Page Number (0000-)
Air cleaner check.....	8H.....	403
Air filter element clean.....	8H.....	404
Brake pedal free travel & parking brake check.....	8H.....	303
Directional tread tires.....	8H.....	604
Engine crankcase check.....	8H.....	003
Engine cooling system check.....	8H.....	103
Hydraulic sump and control levers check.....	8H.....	503
Instrument indicators check.....	8H.....	203
Instrument indicators check.....	8H.....	204
Power steering pump.....	8H.....	703
Tire and rim maintenance.....	8H.....	602
Tire and rim maintenance.....	8H.....	603

### (100 Hours)

Brake pedal free travel check.....	100H.....	302
Brake system check.....	100H.....	303
Battery check.....	100H.....	604
Cooling system check.....	100H.....	103
Engine crankcase and oil filter check.....	100H.....	003
Fan and generator drive belt check.....	100H.....	203
Hydraulic sump tank breather.....	100H.....	503
Lifting mechanisms check.....	100H.....	403
Lubrication chart.....	100H.....	703

### (500 Hours)

Hydraulic sump tank and filter check.....	500H.....	004
Hydraulic sump tank and filter check.....	500H.....	103
Manifolds check.....	500H.....	403
Steering gear adjust.....	500H.....	202
Steering gear adjust.....	500H.....	203
Steering axle and linkage adjustments.....	500H.....	302
Steering axle and linkage adjustments.....	500H.....	303
Transmission oil filter check.....	500H.....	003

### (1000H)

Axle ends lubrication.....	1000H.....	805
Brake bleeding procedure.....	1000H.....	912
Brake bleeding procedure.....	1000H.....	913
Brake service.....	1000H.....	1003
Battery check.....	1000H.....	1705
Cylinder head, manifolds, crankcase, and valves adjust.....	1000H.....	003
Compression test.....	1000H.....	103
Cooling system inspect and clean.....	1000H.....	1202
Cooling system inspect and clean.....	1000H.....	1203
Distributor adjustments.....	1000H.....	203

### (1000 Hours)

	Time Interval & Number (H=Hours)	Page Number (0000-)
Distributor adjustments.....	1000H.....	203
Distributor adjustments and timing.....	1000H.....	303
Governor adjustment.....	1000H.....	503
Governor adjustment.....	1000H.....	504
Generator adjustment.....	1000H.....	703
Generator adjustment.....	1000H.....	704
Hand brake adjustment.....	1000H.....	1103
Hydraulic system check.....	1000H.....	1503
Hydraulic system check.....	1000H.....	1504
Hydraulic system check.....	1000H.....	1505
Hydraulic system check.....	1000H.....	1507
Lift and upright adjustments.....	1000H.....	1803
Lift carriage roller adjust.....	1000H.....	1811
Lift carriage roller adjust.....	1000H.....	1812
Neutral starting switch.....	1000H.....	1793
Roller adjustments.....	1000H.....	1806
Starting motor.....	1000H.....	603
Starting motor.....	1000H.....	604
Steer wheel bearings lubrication.....	1000H.....	803
Timing.....	1000H.....	304
Transmission stall and pressure checks.....	1000H.....	1703
Transmission stall and pressure checks.....	1000H.....	1704
Upright roller adjustments.....	1000H.....	1807
Upright roller adjustments.....	1000H.....	1808
Upright roller adjustments.....	1000H.....	1815
Valve adjustments.....	1000H.....	004
Vacuum test.....	1000H.....	403

### NOTE

Lubrication and preventive maintenance illustrations at the beginning of each time interval section. When performing the 100, 500 or 1000 hour lubrication and preventive maintenance, always include the previous lubrication and preventive maintenance schedules.



# INDUSTRIAL TRUCK DIVISION



Model	Capacity	Price	Notes
FD-35	3500 lbs	\$12,500	Standard model
FD-50	5000 lbs	\$15,500	Standard model
FD-70	7000 lbs	\$18,500	Standard model
FD-100	10000 lbs	\$22,500	Standard model
FD-150	15000 lbs	\$28,500	Standard model
FD-200	20000 lbs	\$34,500	Standard model
FD-300	30000 lbs	\$42,500	Standard model
FD-400	40000 lbs	\$50,500	Standard model
FD-500	50000 lbs	\$58,500	Standard model
FD-600	60000 lbs	\$66,500	Standard model
FD-700	70000 lbs	\$74,500	Standard model
FD-800	80000 lbs	\$82,500	Standard model
FD-900	90000 lbs	\$90,500	Standard model
FD-1000	100000 lbs	\$98,500	Standard model
FD-1500	150000 lbs	\$148,500	Standard model
FD-2000	200000 lbs	\$198,500	Standard model
FD-3000	300000 lbs	\$298,500	Standard model
FD-4000	400000 lbs	\$398,500	Standard model
FD-5000	500000 lbs	\$498,500	Standard model
FD-6000	600000 lbs	\$598,500	Standard model
FD-7000	700000 lbs	\$698,500	Standard model
FD-8000	800000 lbs	\$798,500	Standard model
FD-9000	900000 lbs	\$898,500	Standard model
FD-10000	1000000 lbs	\$998,500	Standard model
FD-15000	1500000 lbs	\$1498,500	Standard model
FD-20000	2000000 lbs	\$1998,500	Standard model
FD-30000	3000000 lbs	\$2998,500	Standard model
FD-40000	4000000 lbs	\$3998,500	Standard model
FD-50000	5000000 lbs	\$4998,500	Standard model
FD-60000	6000000 lbs	\$5998,500	Standard model
FD-70000	7000000 lbs	\$6998,500	Standard model
FD-80000	8000000 lbs	\$7998,500	Standard model
FD-90000	9000000 lbs	\$8998,500	Standard model
FD-100000	10000000 lbs	\$9998,500	Standard model

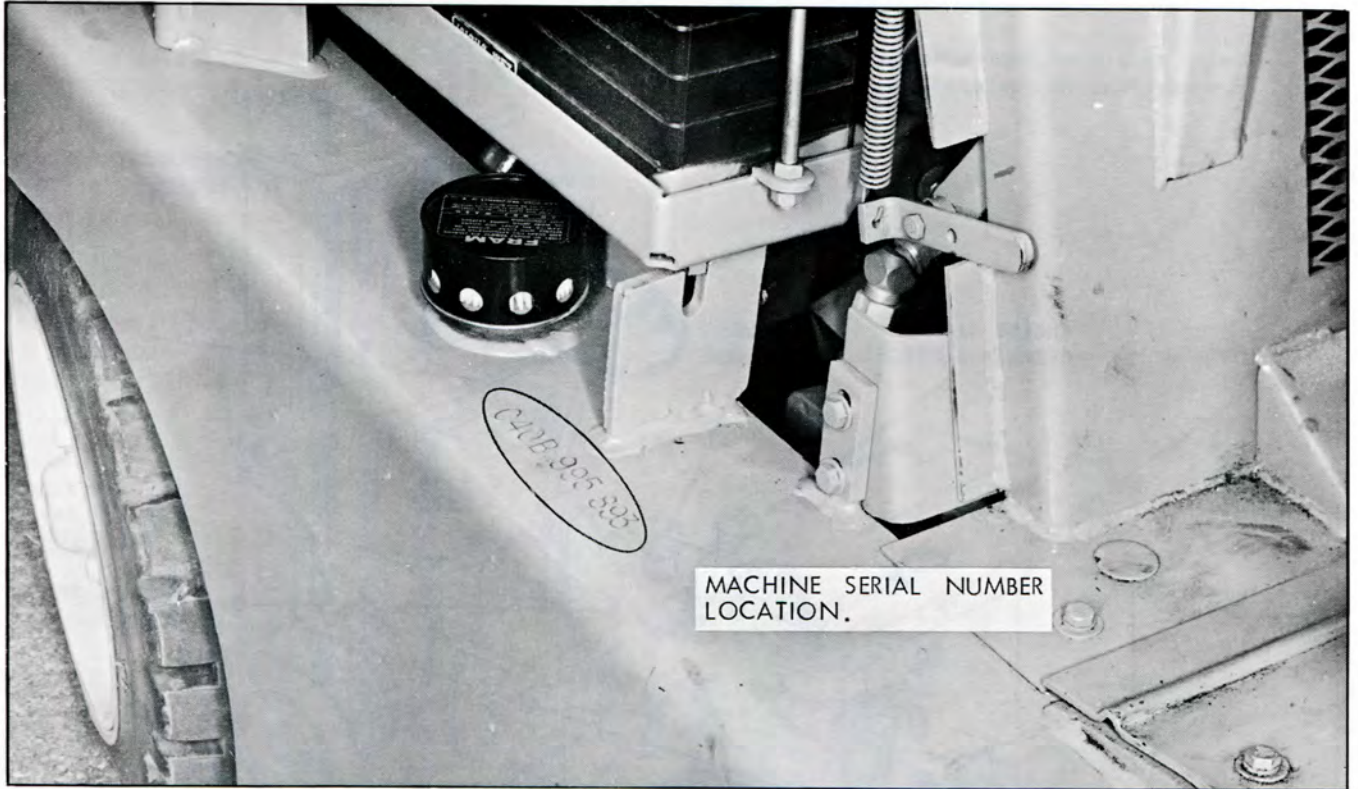


Plate 9474. Machine Serial No. Location

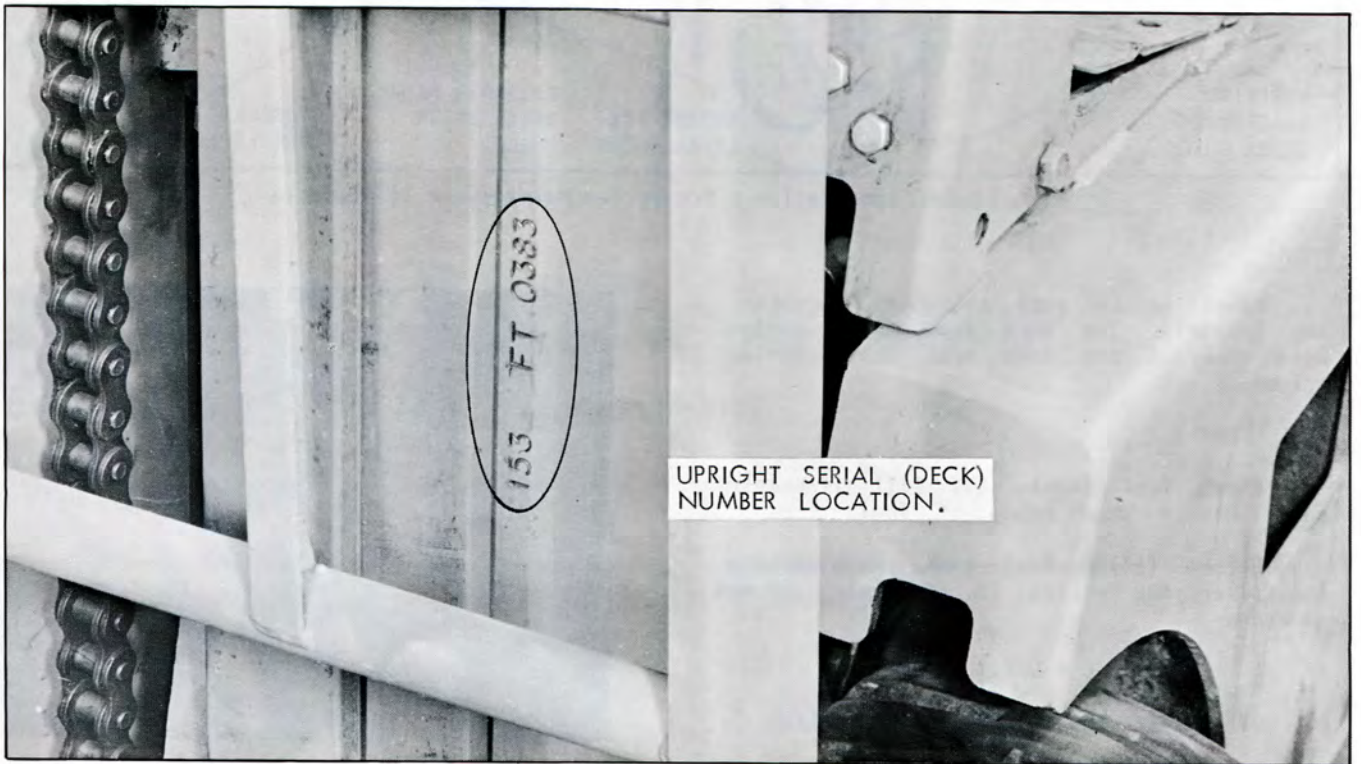


Plate 9475. Upright Serial (Deck) No. Location

8 HOURS

Refer to Diesel Engine Manual for machines so equipped.

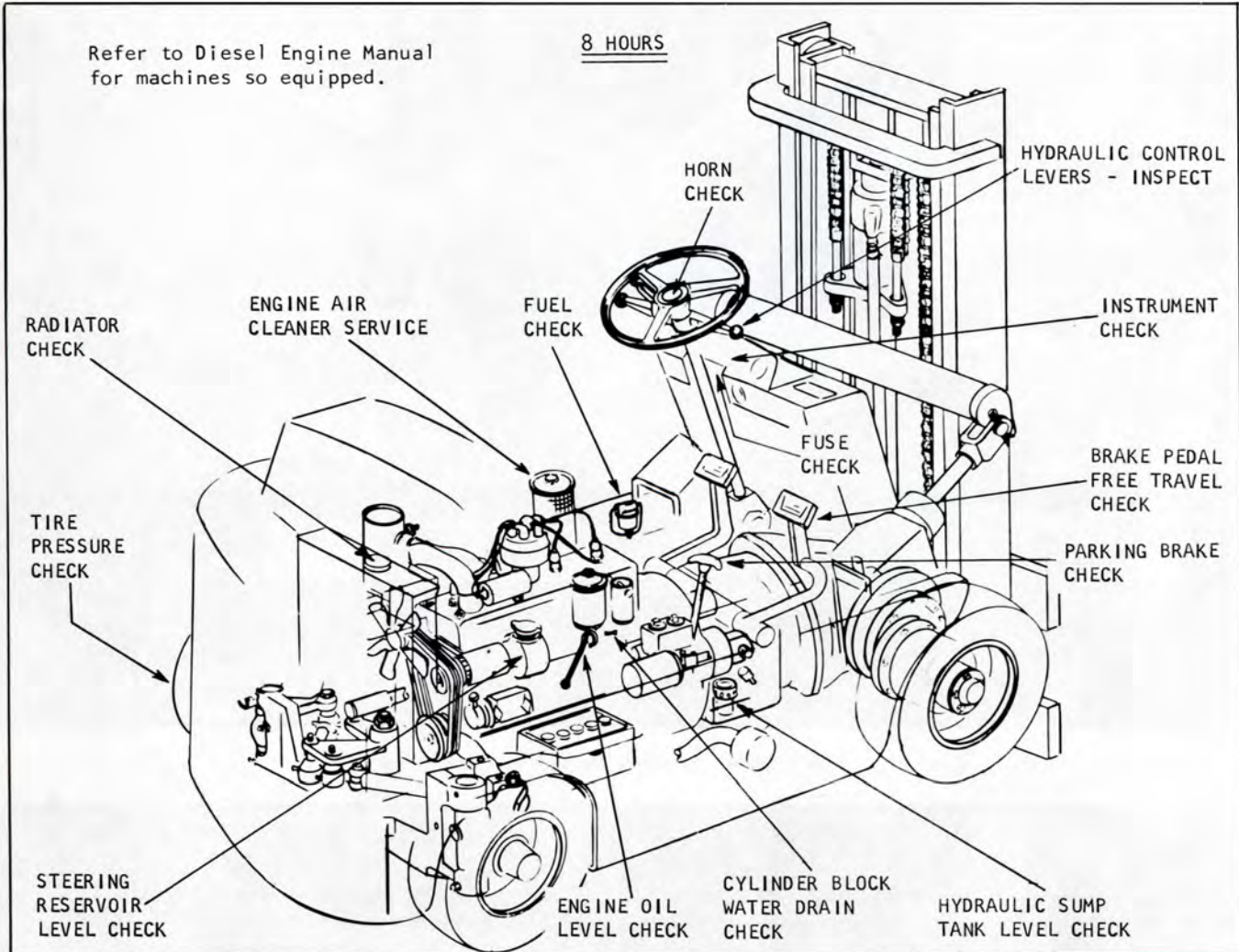


Plate 8610. Lubrication & Preventive Maintenance Illustration

**HORN**

Check to be sure the horn is working properly. The horn fuse holder is located beneath the dash near the steering column.

**FUEL TANK**

Check fuel supply and fill if necessary. Use a good grade of fuel.

Before filling fuel tank, make certain the filler cap screen is in place and not damaged.

**CAUTION**

DO NOT REMOVE THE SCREEN WHILE FILLING TANK.

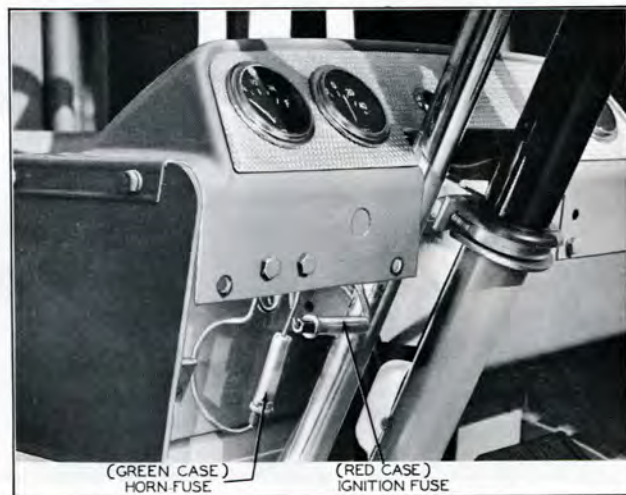


Plate 5900. Horn Fuse



Engine Crankcase

Before attempting to start the engine...make sure the crankcase has sufficient oil.

**N O T E**

The oil filler pipe is located on the right side of the engine.

The oil level dipstick is also located on the right side of the engine.

Fill the crankcase reservoir through the filler pipe... check oil for proper level as indicated on the crankcase dipstick.

**C A U T I O N**

NEVER PERMIT OIL LEVEL TO FALL BELOW THE LOW LEVEL MARK ON THE CRANKCASE DIPSTICK.

Do not overfill the crankcase..too much oil will bring the level high enough for the connecting rods to dip, thus causing excessive quantities of oil to be thrown to the cylinder walls resulting in oil consumption, smoking, excessive carbon deposits and fouled spark plugs.

**N O T E**

On L.P. Gas machines...use a non-detergent oil during break-in periods.



Plate 6629. Crankcase...location of Fill Cap and Oil Level Dipstick.

**LUBRICATING OIL RECOMMENDATIONS**

Crankcase Capacity...Refer to Specifications

**SERVICE "MS"**

S.A.E.	10W	0 deg to 32 deg F.
S.A.E.	20W	32 deg to 75 deg F.
S.A.E.	30	above 75 deg F.

Low Temperature Operation

Multi-viscosity oil should be used only where starting conditions make it necessary. The oil supplier should assume full responsibility for satisfactory performance of the multi-viscosity oil at both low and normal engine operating temperatures.

Service Conditions

Oil performance will reflect engine load, temperature, fuel quality, atmospheric dirt, moisture and maintenance. Where oil performance problems arise or are anticipated...the oil supplier should be consulted. When extended drain periods are contemplated, his analysis or that of a reputable laboratory should determine the suitability of oil for further service.

**N O T E**

Refer to Diesel engine manual for machines so equipped.

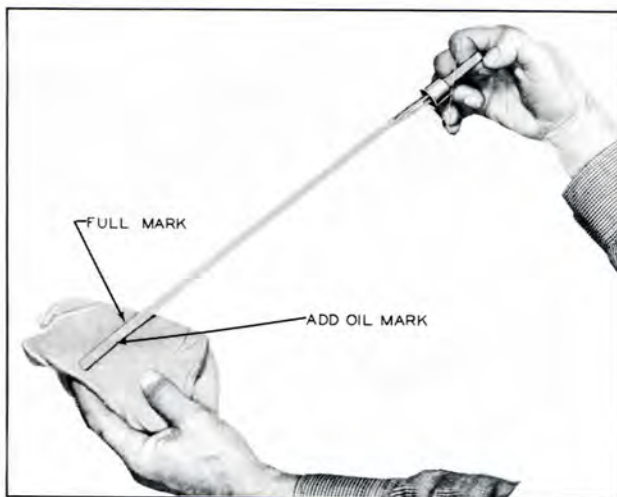


Plate 3145. Check Crankcase with Dipstick

## ENGINE COOLING

Make sure that the radiator drain cock and the water drain in the cylinder block are closed. Check radiator coolant level and fill to within 1 inch of the top with clean water; or if operation is in cold weather, use a suitable anti-freeze solution.

It is recommended that a soluble oil in the proportion of 1 ounce per gallon of water be added to the Cooling System.

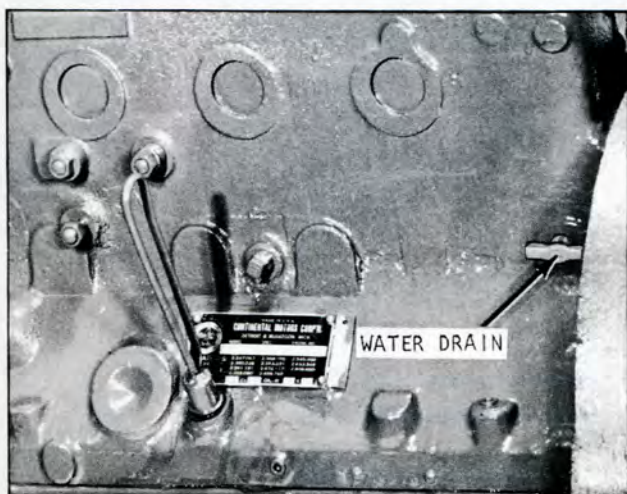


Plate 7008. Typical Cylinder Block Water Drain

## CAUTION

NEVER POUR COLD WATER OR COLD ANTI-FREEZE INTO THE RADIATOR OF AN OVERHEATED ENGINE. ALLOW THE ENGINE TO COOL AND AVOID THE DANGER OF CRACKING THE CYLINDER HEAD OR BLOCK. KEEP ENGINE RUNNING WHILE ADDING WATER OR ANTI-FREEZE. WHEN PERMANENT ANTI-FREEZE OF THE ETHYLENE GLYCOL TYPE IS USED, THE COOLANT SOLUTION MUST CONTAIN AT LEAST 40% WATER.

## NOTE

REFER TO DIESEL ENGINE MANUAL FOR MACHINES SO EQUIPPED.

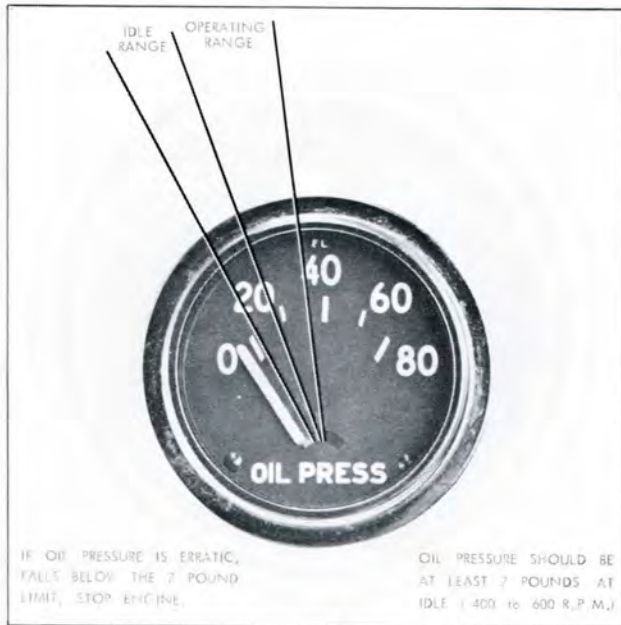


Plate 6288. Oil Pressure Indicator  
(MACHINES SO EQUIPPED)



Plate 6885. Oil Pressure Warning Light  
(MACHINES SO EQUIPPED)

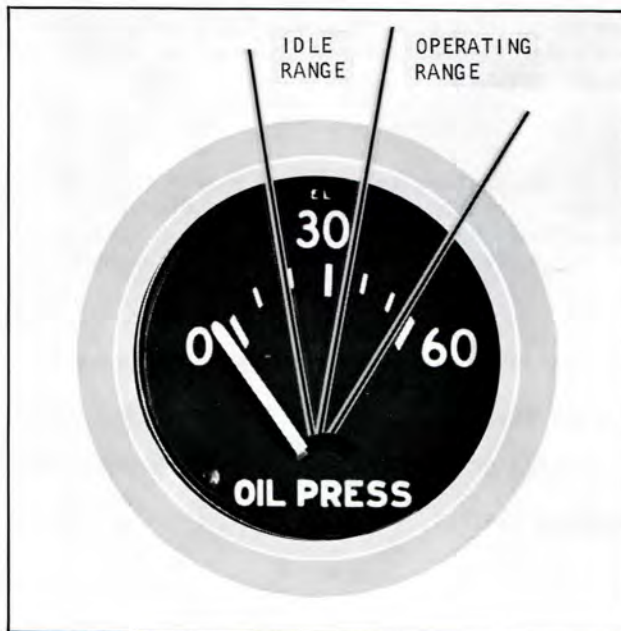


Plate 8606. Oil Pressure Indicator  
(MACHINES SO EQUIPPED)

a. Oil Pressure Indicator. Select the gauge in your machine. Your machine engine oil pressure should read as marked in the illustration.

**C A U T I O N**

IF OIL PRESSURE WARNING LIGHT COMES ON, STOP THE ENGINE IMMEDIATELY AND FIND THE CAUSE OF THE TROUBLE. REFER TO TROUBLE SHOOTING SECTION FOR THIS INFORMATION. IF THE OIL PRESSURE IS ERRATIC OR FALLS BELOW THE ABOVE LIMIT, STOP THE ENGINE IMMEDIATELY AND FIND THE CAUSE OF THE TROUBLE. REFER TO TROUBLE SHOOTING SECTION FOR THIS INFORMATION. ON NEW MACHINES, AFTER STARTING ENGINE, RUN IT AT IDLE FOR FIVE MINUTES, THEN STOP ENGINE AND RECHECK OIL LEVEL IN CRANKCASE. BRING OIL LEVEL TO HIGH MARK, IF NECESSARY.

**N O T E**

Before placing machine operation, run engine a few minutes to warm oil especially in cold operating conditions.

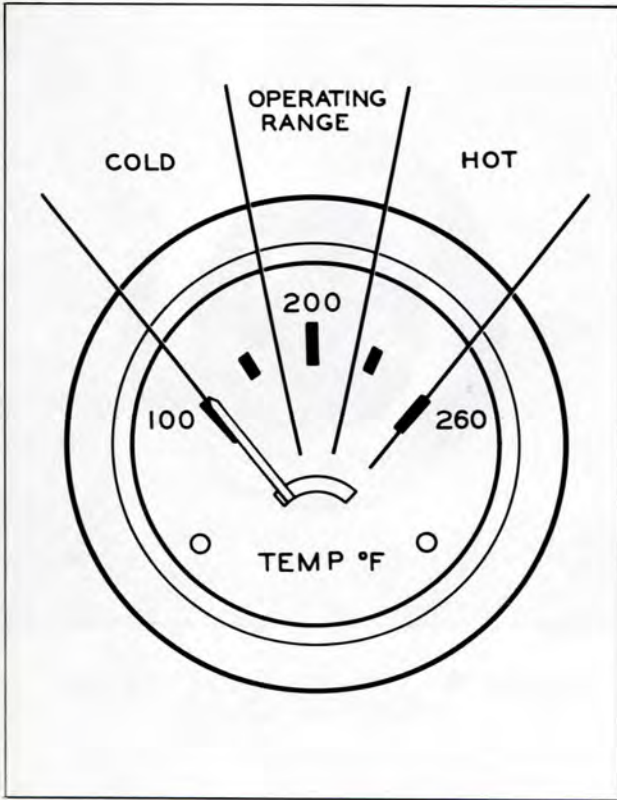


Plate 8288. Engine Coolant Temperature Indicator



Plate 7162. Hour Meter

The hour meter accurately records the actual hours of machine operation. This will serve as an aid in determining the time intervals for lubrication and preventive maintenance services.

**N O T E**

The coolant temperature should register in the operating range after the first few minutes of operation. Low operating temperatures wastes fuel and increases engine wear.

**C A U T I O N**

DO NOT IDLE THE ENGINE FOR LONG PERIODS AS IT IS NOT ONLY DETRIMENTAL TO THE ENGINE BUT ALSO INCREASES OPERATING COSTS AS YOU ARE USING FUEL WITHOUT BENEFIT.

**N O T E**

Select the indicator in your machine. Coolant temperatures should read as marked, except for diesel equipped machines.

DIESEL MACHINES: REFER TO DIESEL OPERATORS MANUAL FOR COOLANT TEMPERATURES.

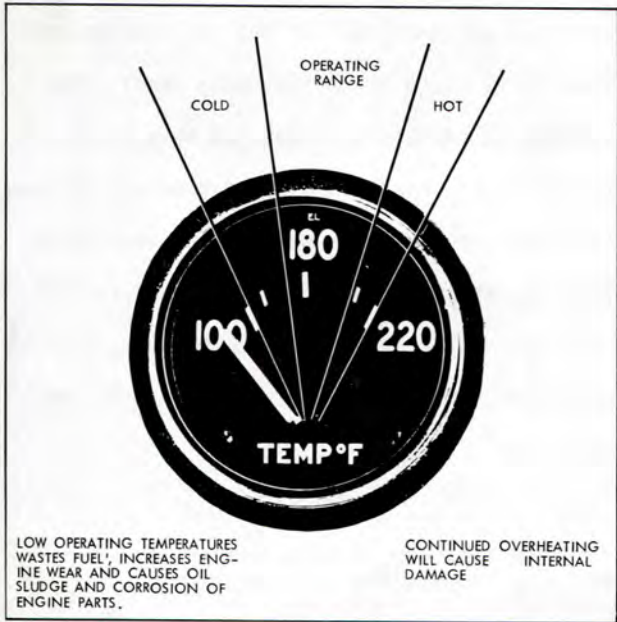


Plate 6287. Engine Coolant Temperature Indicator

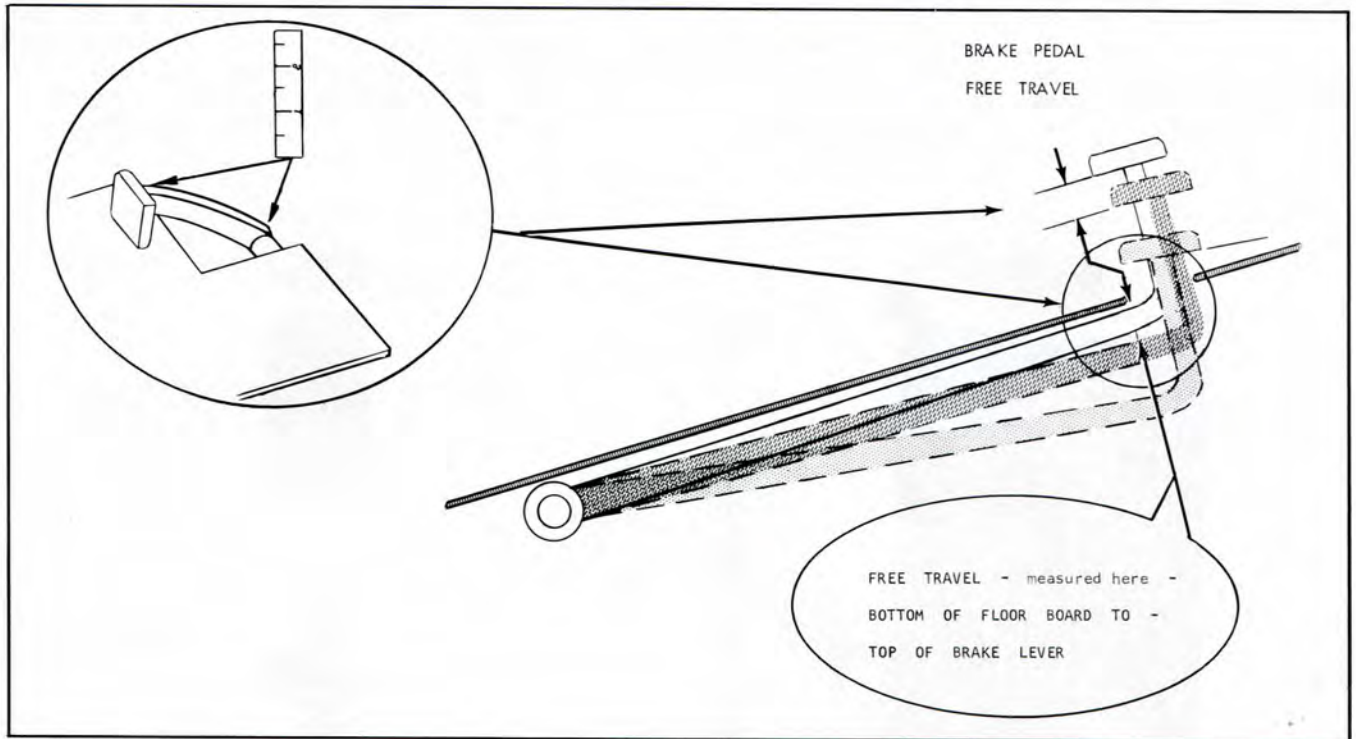


Plate 6630. Brake Pedal Free Travel

**BRAKE PEDAL**

1. Depress brake pedal and hold foot pressure for at least ten seconds. Pedal must be solid, must not be spongy or drift under foot pressure.

**PARKING BRAKE**

Fully apply the hand brake. Full application of hand brake should require 1 1/2 to 2 inches of travel. If the lever travel exceeds this amount the linkage should be adjusted.

Parking Brake Effectiveness - must be capable of holding the truck, with full rated load, on a 15% grade. This should be tested while occupying the driver's seat with the parking brake applied and truck out of gear.

If brake operation is not satisfactory, report to designated person in authority.



Plate 6625. Parking Brake

LUBRICATION AND PREVENTIVE MAINTENANCE

ENGINE AIR CLEANER (DRY TYPE)

Operating conditions determine the air cleaner service periods. The air cleaner should be checked every 8 operating hours and cleaned. This may be necessary more often under dusty operating conditions.

dirt from entering at these points. Periodically remove hoses and check interior for any signs of dirt or dust. If found, this indicates that more frequent cleaning intervals are necessary as the hose interior should be free of all dirt and dust.

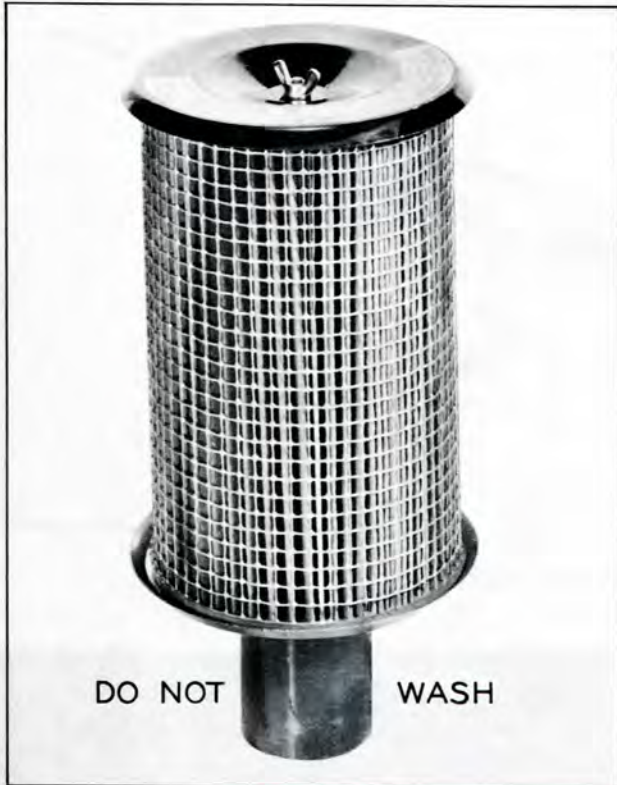


Plate 5697. Air Cleaner

Proper servicing means cleaning unit thoroughly and maintaining air-tight connections between the air cleaner and intake manifold so that all air entering the engine is filtered.

1. Remove air cleaner cartridge (2) and tap cartridge on a hard flat surface until all loose dirt is removed.
2. After cleaning by the above procedure, clean unit with filtered, moisture free, compressed air. Direct air stream from the inside, (thru cartridge) outward at the same time rotating cartridge by hand.

NOTE

IF FILTER CARTRIDGE CANNOT BE PROPERLY CLEANED, REPLACEMENT IS NECESSARY.

Check all hose connections to be sure they are tight thus preventing any air and

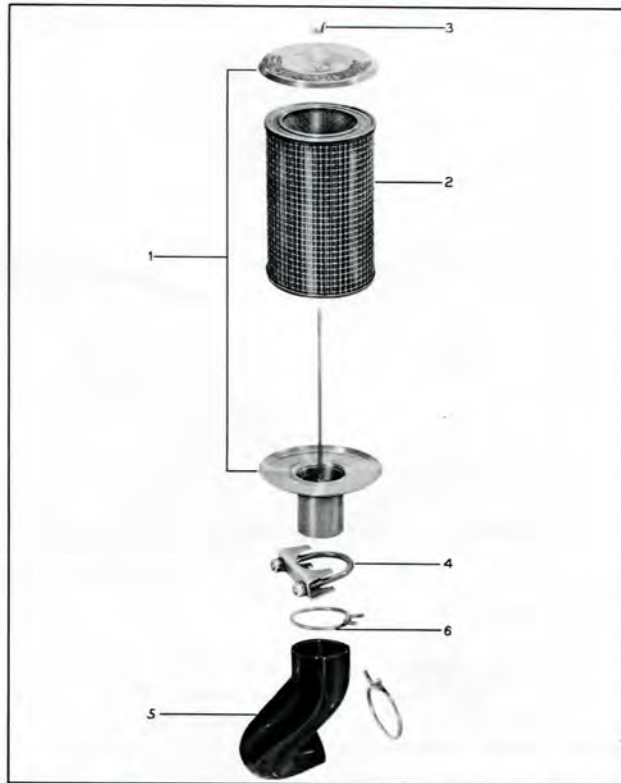


Plate 6980. Air Cleaner Components

NOTE

DEPENDING ON THE TYPE OF OPERATING THE MACHINE IS SUBJECTED TO WILL DETERMINE THE FREQUENCY OF AIR CLEANER MAINTENANCE. HAP- HAZARD MAINTENANCE WILL LEAD TO SHORT ENGINE LIFE. AIR CLEANER MAINTENANCE MAY SEEM TRIVIAL, BUT IT CAN MEAN LONGER ENGINE LIFE, LESS ENGINE UPKEEP AND BETTER ECONOMY PROVIDED PROPER MAINTENANCE IS EXERCISED. CLOSE OBSERVANCE AND COMMON SENSE CAN BEST DETERMINE THE FREQUENCY OF AIR CLEANER MAINTENANCE.

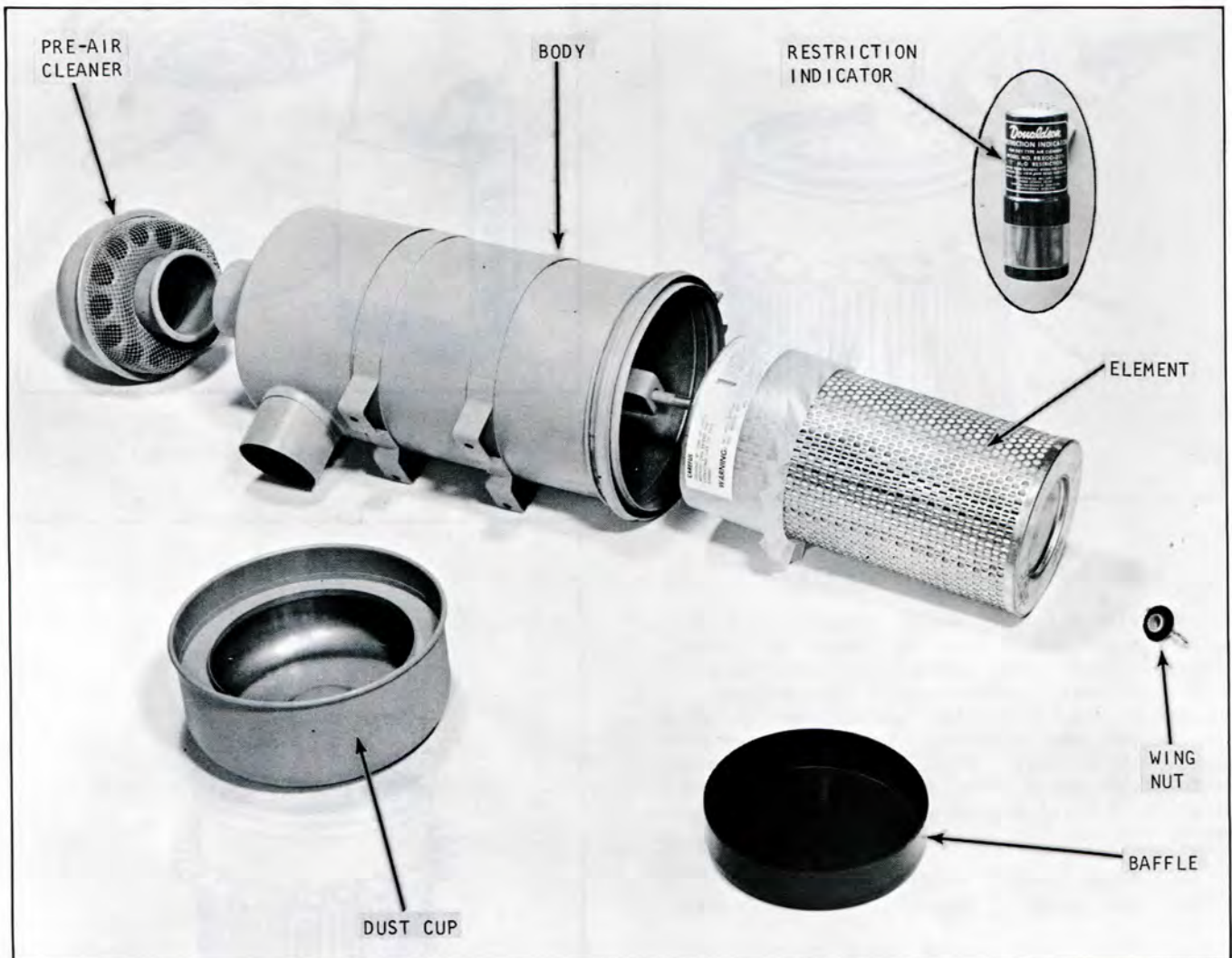


Plate 8310. Typical Air Cleaner Assembly

**ENGINE AIR CLEANER**

Operating conditions determine the air cleaner service periods. The air cleaner should be checked and cleaned every 8 operating hours. This may be necessary more often under dusty operating conditions. Proper servicing means cleaning unit thoroughly and maintaining air-tight connections between the air cleaner and intake manifold so that all air entering the engine is filtered.

1. Remove air stack cap (pre-air cleaner) and clean exterior and interior.

2. Remove dust cup from air cleaner, remove baffle and empty dust from cup.

3. Remove thumb screw and pull out filter element. Clean thoroughly by using the following methods.

a. With a dry dusty element, direct moisture free compressed air (100 P.S.I. or less) up and down pleats on the clean air side of the filter. Maintain reasonable distance between nozzle and filter to avoid rupturing the element.



Plate 7173. Cleaning Dusty Element

b. With oily or sooty element, use a garden hose (40 P.S.I. or less) to clean element. Then wash element in warm water (120° or less) containing a non-sudsing household detergent. The warmer the solution the better the cleaning. Soak for approximately 15 minutes. Rinse element thoroughly with clean water from hose (maximum pressure 40 P.S.I.) Air dry completely before using.

4. Clean cover, baffle and inside of filter body with a clean lint free cloth.

5. Check air cleaner hose connections to be sure they are air tight.

6. After air cleaner has dried, (a fan or air draft may be used, but do not heat element to hasten drying) inspect element for damage by placing a bright light inside element. Thin spots, pin holes or the slightest rupture will render the element unfit for further use.

**RESTRICTION INDICATOR (Machines so Equipped)**

Service filter element when red signal locks in full view. After filter element has been cleaned or replaced, reset indicator by pushing on reset button.

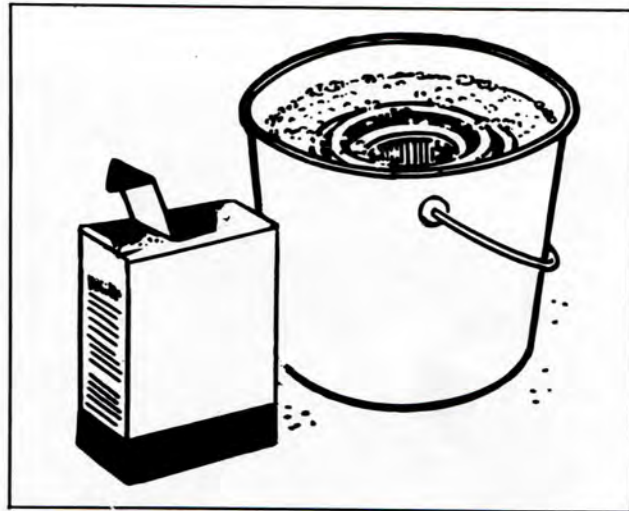


Plate 7174. Cleaning Oily Sooty Element

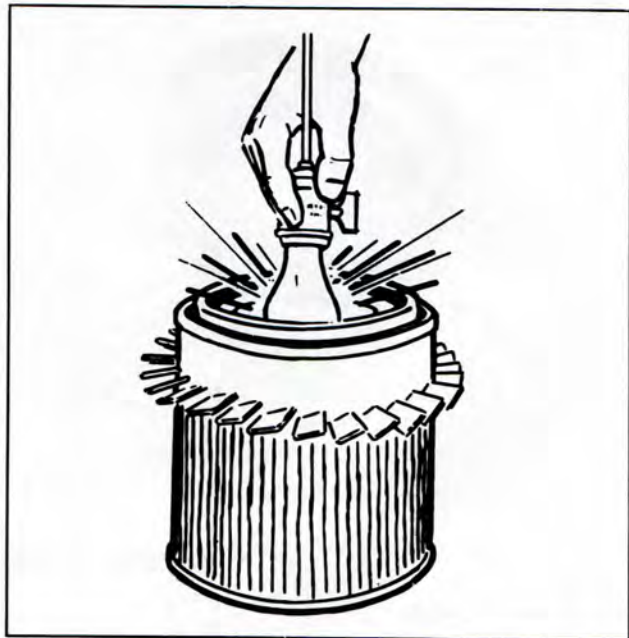


Plate 7166. Inspecting Element with Light





Plate 6626. Hydraulic Sump Tank and Sump Breather

**HYDRAULIC SUMP TANK**

Check hydraulic sump tank fluid level in the following manner:

1. Lower upright.
2. Turn switch key to off position.
3. Remove sump breather. Fluid level should be up to bottom of filler pipe.

If necessary, fill sump tank using MS 68 Hydraulic fluid. Move valve control levers with hydraulic pump operating to allow any air in the lines to escape, then recheck sump tank fluid level and fill as required before putting machine in operation.

**HYDRAULIC CONTROL LEVERS**

**IMPORTANT**

EVERY 8 OPERATING HOURS (OR EVERY SHIFT)

ELEVATE UPRIGHT TO THE UPPER LIMIT. THIS WILL PROVIDE LUBRICATION TO THE TOP PORTION OF THE LIFT CYLINDER.

Check lift and tilt operation. The lift and tilt cylinders should actuate when lift or tilt levers are moved either way from neutral position.

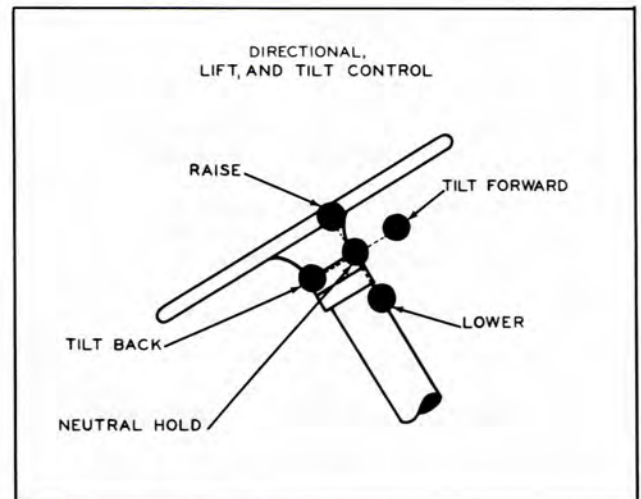


Plate 4448. Lift and Tilt Lever

When load is elevated and control lever returned to neutral position, load should remain in elevated position with no noticeable downward drift. If load drifts downward excessively, this may indicate lift cylinder U-Cup or seal damage -- report to designated person in authority.

With tilt lever in neutral position, upright should remain steady with no noticeable backward or forward drift. If upright drifts excessively either way, this may indicate tilt cylinder seal or U-Cup damage -- report to designated person in authority.

**CAUTION**

NEVER ALLOW LOADED OR UNLOADED LIFT CARRIAGE TO REMAIN IN AN ELEVATED POSITION FOR ANY PROLONGED PERIODS. LIFT CARRIAGE SHOULD BE LOWERED WHEN NOT IN USE.

DO NOT HOLD CONTROL LEVERS IN EXTREME POSITIONS AFTER A LOAD HAS REACHED ITS LIMITS. TO DO SO WILL RESULT IN HIGH OIL PRESSURE THAT MAY RESULT IN HEATING OF THE HYDRAULIC OIL.





# INDUSTRIAL TRUCK DIVISION



IMPORTANT

## TIRE MAINTENANCE (CONTINUED):

wedging into it. Tires with cuts treated in this manner may be continued in service without danger of further growth of these injuries. If a tire has at least one deep cut that requires a repair, then all smaller cuts may be quickly and economically repaired and vulcanized by the steam kettle method.

```

x x x x x x x x x x x x x x x x x x x x x x x
x
x          W A R N I N G
x
x  IT IS NOT RECOMMENDED THAT TIRES WITH
x
x  BREAKS BE USED AGAIN.
x
x x x x x x x x x x x x x x x x x x x x x x x

```

If uneven tire wear is evident, wheel alignment should be checked.

## TIRE INFLATION:

Before inflating tires, make certain all wheel nuts are tightened to proper torque (see Specifications).

```

x x x x x x x x x x x x x x x x x x x x x x x
x
x          W A R N I N G
x
x  IN ALL CASES, WHEN REMOVING TIRES WITH
x
x  SPLIT RIMS FROM THE MACHINE FOR REPAIR
x
x  OR PERIODIC ROTATION, COMPLETELY DEFLATE
x
x  TIRES. THIS IS ACCOMPLISHED BY REMOVING
x
x  THE VALVE CORE.
x
x x x x x x x x x x x x x x x x x x x x x x x

```

```

x x x x x x x x x x x x x x x x x x x x x x x
x
x          W A R N I N G
x
x  IN ALL CASES, WHEN REMOVING TIRES EQUIPPED
x
x  WITH THE LOCK RING TYPE RIM FROM THE MA-
x
x  CHINE FOR REPAIR OR PERIODIC ROTATION,
x
x  COMPLETELY DEFLATE TIRES. THIS IS ACCOM-
x
x  PLISHED BY REMOVING THE VALVE CORE.
x
x x x x x x x x x x x x x x x x x x x x x x x

```

```

x x x x x x x x x x x x x x x x x x x x x x x
x
x          W A R N I N G
x
x  WHEN REPAIRING TIRES USED ON MACHINES
x
x  THAT EMPLOY THE LOCK RING TYPE RIM, USE
x
x  CAUTION WHEN INFLATING TIRE, PROCEED AS
x
x  FOLLOWS:
x
x x x x x x x x x x x x x x x x x x x x x x x

```

1. After positioning lock ring on rim, turn wheel and rim assembly over so that lock ring is on side toward ground.
2. Inflate tire to 5 to 10 pounds.
3. Turn rim over and tap lock ring carefully with a mallet to be sure it is properly seated.
4. If you have access to a steel cage...use it, (see next page)...otherwise turn rim and wheel over once again so that lock ring is on the bottom and inflate tire to proper pressure..

```

x x x x x x x x x x x x x x x x x x x x x x x
x
x          W A R N I N G
x
x  IF LOCK RING IS NOT LOCATED PROPERLY, IT
x
x  IS POSSIBLE FOR IT TO POP OFF RIM WITH
x
x  GREAT FORCE WHEN TIRE IS INFLATED AND
x
x  COULD RESULT IN SERIOUS INJURY TO ANYONE
x
x  STRUCK BY IT.
x
x x x x x x x x x x x x x x x x x x x x x x x

```

On machines using split rims, make periodic checks for noises in the wheel, as it is possible for damage to occur to the wheel bolts if they are not securely tightened when tires are changed. If the wheel bolts are loose or have been sheared off as a result of being loose, a grinding or scraping noise will be present when wheels are turned. Should this condition exist, it will be necessary to immediately remove the rim and tire from the machine and determine the cause of noise and repair or replace defective parts.

## N O T E

Refer to WARNING on deflation of tires before removing wheels from machine.

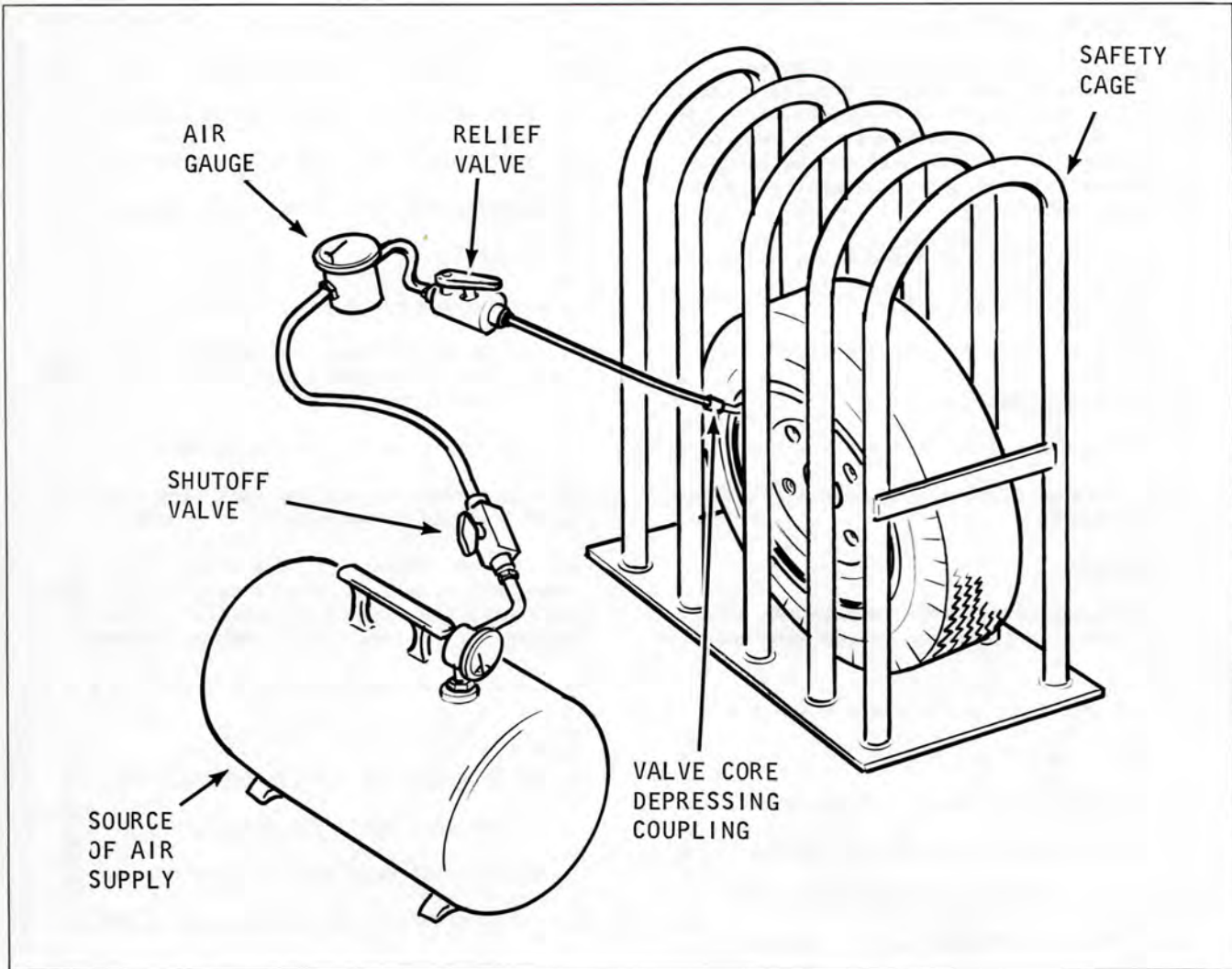


Plate 9702. Typical Tire Inflation Procedure

Torque wheel stud nuts or wheel bolts to the values listed in specifications. Excessive torque of wheel nuts can cause stud and rim damage.

Any replacement parts used should be of a quality equal to that provided in the original manufacture.

Inflation

```

x x x x x x x x x x x x x x x x x x x x x x x x
x
x CAUTION x
x ALL FASTENERS SHOULD BE PROPERLY INSTALLED x
x BEFORE INFLATING WHEEL/TIRE ASSEMBLY. x
x
x x x x x x x x x x x x x x x x x x x x x x x x
    
```

Tires with split wheels should be inflated in a safety cage or when properly installed on the vehicle. In either case, make sure all nuts and bolts are properly installed and torqued according to specifications.

```

x x x x x x x x x x x x x x x x x x x x x x x x
x
x CAUTION x
x USE ONLY AN APPROVED SAFETY CAGE DESIGNED x
x FOR THIS PURPOSE. x
x
x x x x x x x x x x x x x x x x x x x x x x x x
    
```

Tires used on lock-ring type wheels should be inflated in a safety cage (see previous caution) or use a clip-on type air chuck and stand aside (in-line with the tire tread) during inflation. Insure that rings are properly



Plate 7613. Typical Split Wheel

seated prior to inflation. An inflated tire contains potentially explosive energy that can blow rings loose.

All wheel/tire assemblies should be inflated in a safety cage. The air hose should have a special set-up as shown in Plate 9702. The hose should have an adapter so that it can be securely fastened to the valve stem. Using this set-up you would:

1. Attach air hose to valve stem.
2. Open shut-off valve allowing compressed air to enter tube.
3. Shut off air supply occasionally to check pressure in tube at air gauge.
4. Inflate to proper capacity. If pressure exceeds proper inflation capacity, depress the relief valve to release excess air pressure.
5. This alternating procedure is followed until proper inflation is reached. See specifications.

I M P O R T A N T

MAINTAIN UNIFORM INFLATION IN BOTH TIRES OF A DUAL ASSEMBLY SO THAT WEIGHT IS EQUALLY SUSTAINED. NEVER RE-INFLATE A TIRE THAT HAS GONE FLAT WITHOUT FIRST INSPECTING IT AND THE WHEEL ASSEMBLY.

The tire inflation arrangement as shown in Plate 9702 can be made up from local suppliers.

Parts can be ordered from the following suppliers:

Relief Valve - Model 250V-1/4"

Humphrey Products  
P.O. Box 2008  
Kilgore at Sprinkle Rd.  
Kalamazoo, Mich.

Shut-Off Valve - Imperial #77E(1/4 to 1/4 1 PT)

Kendall Industrial Supplies, Inc.  
702 N. 20th St.  
Battle Creek, Mich. 49016

Air Gauge - Marshaltown #23 (160 lb, 1/4 1 PT, 2 1/2" diameter gauge)

Kendall Industrial Supplies, Inc.  
702 N. 20th St.  
Battle Creek, Mich. 49016

Safety Cage

Meyers Tire Supplies  
6400 Epworth Blvd.  
Detroit, Mich.

**DIRECTIONAL TREAD TIRES**

All directional tread tires are to be mounted in the correct position with respect to the arrow cast on the side of the tire as explained and illustrated below.

Directional Tread Dual Tires:

1. Inside dual tire arrow to point in the direction of forward rotation, see Plate 6422.

(Rotate wheel to bring arrow on tire above the wheel. Arrow must point toward front of truck.)



Plate 6422. Inside Dual Tire  
(or Single Drive Tire)  
(Arrow to point toward front of truck)

2. Outside dual tire arrow to point in the direction of rearward rotation, see Plate 6423.

(Rotate wheel to bring arrow on tire above the wheel. Arrow must point toward rear of truck.)

Directional Tread Single Drive Tires:

1. Tire arrow to point in the direction of forward rotation, see Plate 6422.

(Rotate wheel to bring arrow on tire above the wheel. Arrow must point toward front of truck, see Plate 6422.)



Plate 6423. Outside Dual Tire  
(Arrow to point toward rear of truck)

**SOLID OR CUSHION TIRE AND RIM MAINTENANCE**

1. Inspect tires regularly - remove all sharp objects picked up by treads before they have a chance to cut further into the rubber and cause chipping or possible separation of the rubber from the base metal.

2. Avoid overloading and do not allow vehicle to stand under heavy loads for prolonged periods as this will cause a "flat" spot on the tires.

3. Check steering axle alignment regularly to protect against fast, irregular tread wear and separation.

4. If rubber tires come in contact with oils, grease, and gasoline they should be wiped off without delay.

5. Regular lubrication of all wheel bearings will assure free-rolling and elimination of tire drag when stopping or starting.

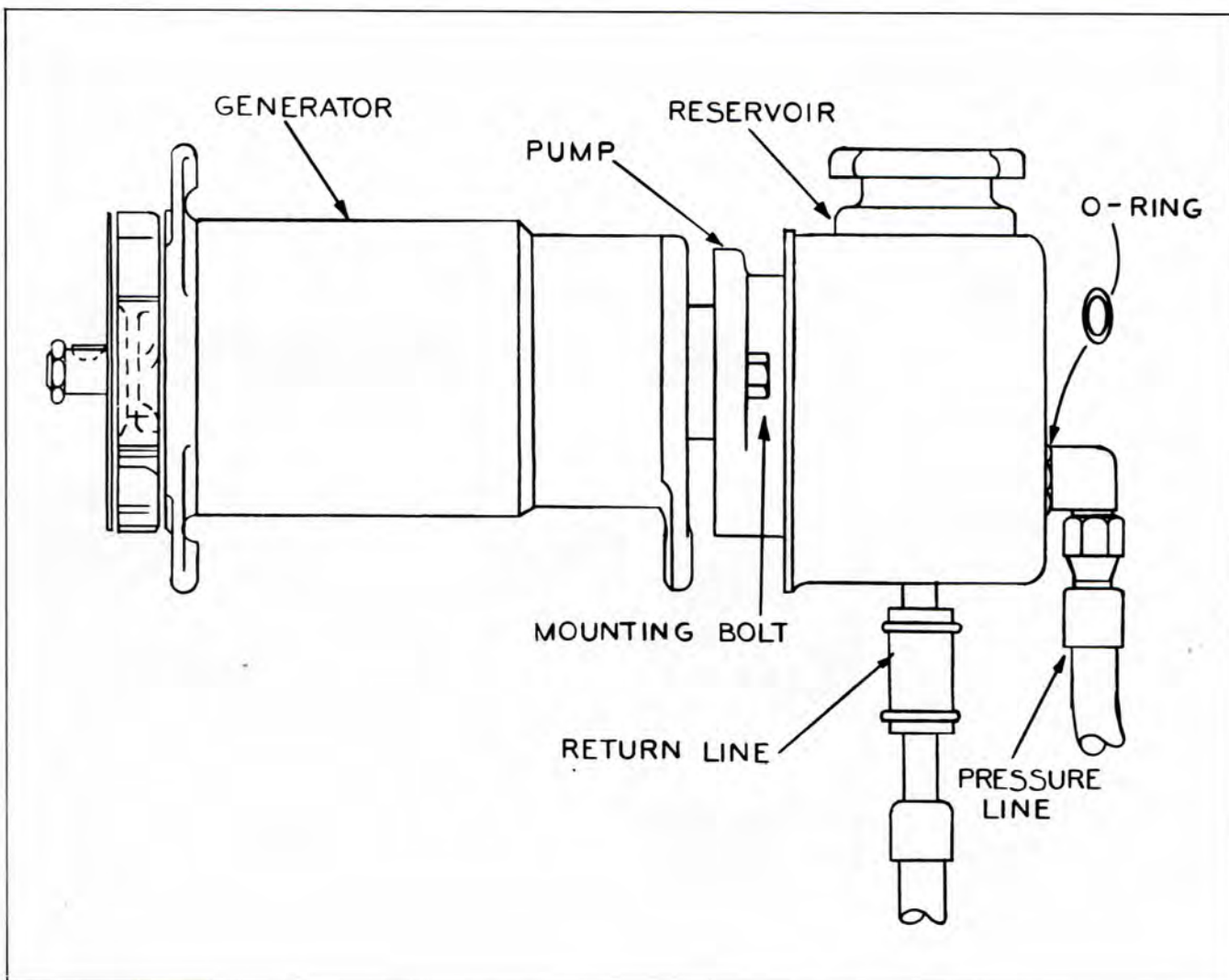


Plate 5940. Typical Power Steering Pump (Machines so Equipped)

Power Steering Pump

Check reservoir fluid level each 8 operating hours. Fill with Type "A" Automatic Transmission Fluid, Clark part number 879803, or DEXRON Automatic Transmission Fluid.

When fluid in reservoir becomes contaminated...it must be drained by removing the return line hose at the bottom of the reservoir. After draining...refill to the proper level with specified fluid. Operate engine for a few minutes and recheck fluid level...fill as required.

**N O T E**

Later model vehicles are equipped with a steering system which is supplied with fluid from the transmission sump (on hydrator models) or from the hydracool clutch reservoir...refer to page 100H657...if your machine is equipped with a hydracool clutch.

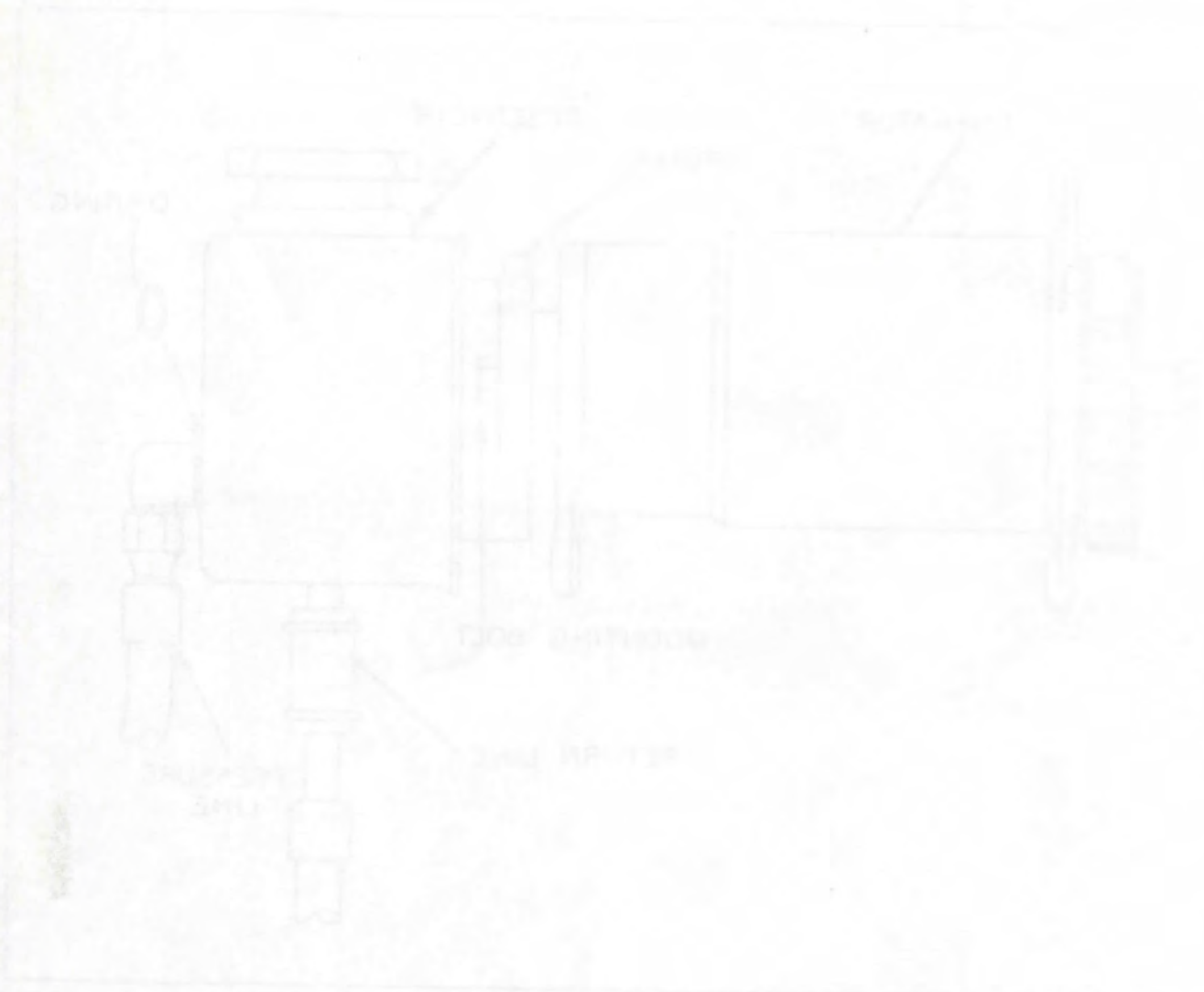
C A U T I O N

DO NOT OPERATE ENGINE WHILE THE RESERVOIR IS EMPTY.....WITH RESERVOIR DRY...PUMP DOES NOT RECEIVE LUBRICATION AND WILL BE SERIOUSLY DAMAGED IF OPERATED EVEN FOR A SECOND UNDER THIS CONDITION.



# INDUSTRIAL TRUCK DIVISION

THE QUALITY OF YOUR INVESTMENT



The truck is designed for heavy-duty work and is built to last. It features a robust chassis and a powerful engine. The truck is available in various configurations to meet your specific needs. Contact us today for more information.

INDUSTRIAL TRUCK DIVISION  
 1234 Main Street  
 Anytown, USA  
 Phone: (555) 123-4567



**ENGINE CRANKCASE**

Every 100 operating hours, drain and refill. (Drain at operating temperatures) Refill, then run engine a few minutes and add oil as necessary to bring oil level to full mark indicated on the dipstick.

Crankcase Capacity — Refer to Specifications  
Service "MS" Oils

- S.A.E. 10W ..... 0° to 32° F.
- S.A.E. 20W .... 32° to 75° F.
- S.A.E. 30W .... above 75° F.

**ENGINE CRANKCASE VENTILATION BREATHER**

Remove breather and oil cup by releasing spring clips. Dislodge foreign particles by washing in a Stoddard type solvent until clean. Allow to air dry. fill oil cup to level mark with oil of same viscosity as used in engine. Replace breather after it is completely air dried.



Plate 7033. Engine Breather

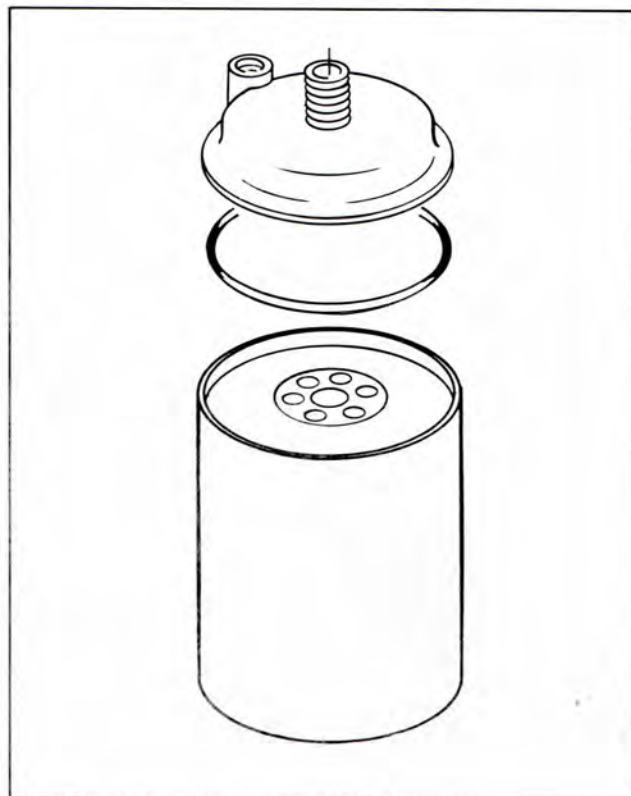


Plate 10444. Engine Oil Filter

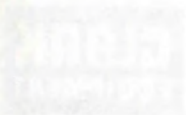
**CAUTION**

DO NOT OVER TIGHTEN FILTER. START ENGINE, RUN AT IDLE FOR A FEW MINUTES, CHECK COVER AND COVER SCREW FOR LEAKS.

The oil filter is of the spin-on throw-away automotive type and should be replaced each time the engine oil is changed.

**NOTE**

Tighten filter until filter seal contacts filter cover. Then turn filter with hands 1/2 to 3/4 of a turn. Never use tools to tighten.



# INDUSTRIAL PAPER DIVISION



Technical drawing area containing faint text and possibly a second drawing, which is mostly illegible due to fading.



Vertical text on the left side of the page, likely a list of specifications or a table of contents, which is mostly illegible.

Vertical text on the right side of the page, likely a list of specifications or a table of contents, which is mostly illegible.

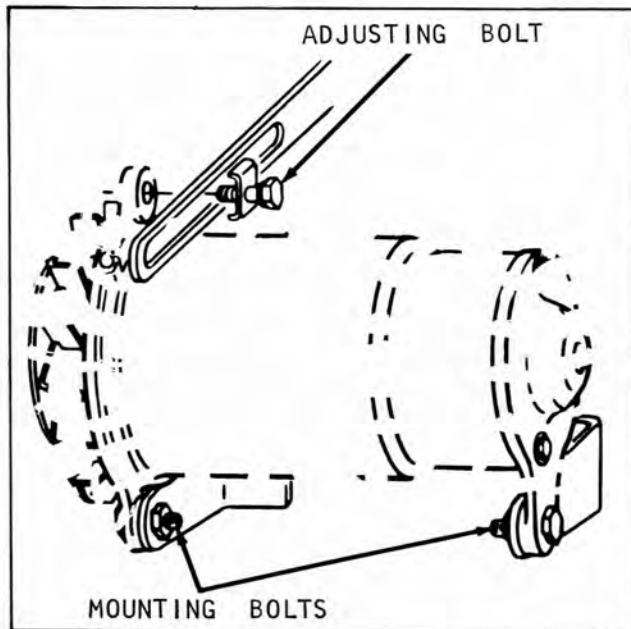


Plate 6631. Generator Drive Belt Adjustment

**FAN AND GENERATOR DRIVE BELTS**

The drive belts should have finger pressure deflection of 3/4 to 1 inch mid-way on long span. If belts require adjustment, use following procedure.

1. Loosen generator brace adjusting bolt and two lower mounting bolts, see Plate 6631.
2. Move generator toward cylinder block to loosen Generator Drive Belts and away from cylinder block to tighten belts. Tighten bolts when correct finger deflection is obtained.

**C A U T I O N**

EXERCISE CAUTION WHEN ADJUSTING BELTS. BELTS ADJUSTED TOO TIGHT WILL VERY LIKELY CAUSE

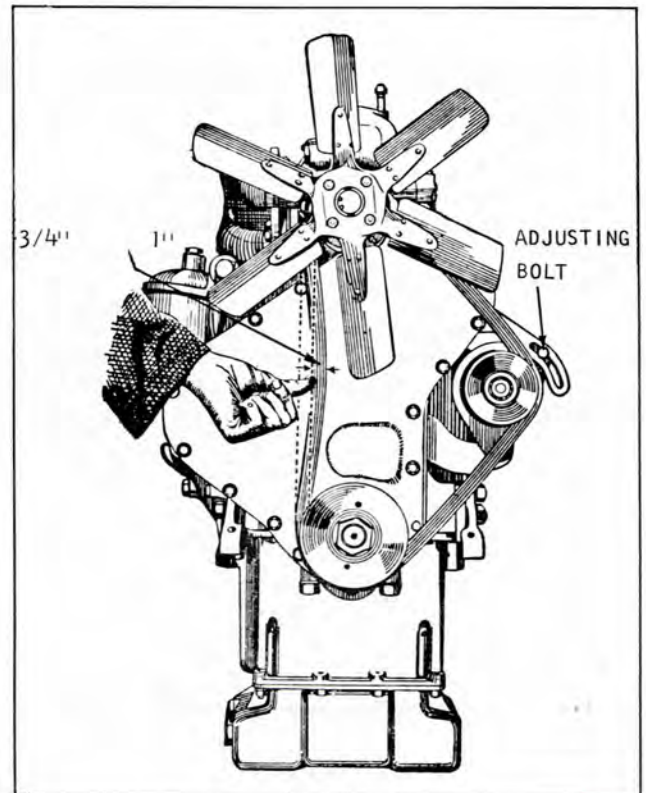


Plate 6632. Belt Deflection Check

BEARING DAMAGE. CONVERSELY, BELTS ADJUSTED TOO LOOSE WILL RESULT IN BELT WEAR AND HIGH ENGINE TEMPERATURE DUE TO BELT SLIP-PAGE.

**N O T E**

UPON REPLACEMENT OF DRIVE BELTS, IT WILL BE NECESSARY TO USE A MATCHED SET OF BELTS.

**BRAKE PEDAL FREE TRAVEL**

Pedal stop bolt should be positioned so that pedal arm will not strike the floorplate when in its full up position.

Depress brake pedal by hand as this is a sensitive adjustment. When resistance is noticed as the master cylinder push rod makes contact with the cylinder piston, the distance traveled by the pedal pad should be within the free travel range listed in specifications. See Plate 7964 for diagram on brake pedal free travel. If free travel is incorrect adjust as follows:

1. Loosen locknut, see Plate 6987.
2. Rotate adjuster in the direction necessary to obtain specified free travel.
3. Tighten locknut to secure adjustment.

**ACTUATION STROKE**

If nearly full pedal travel is necessary to apply the brakes, there is an indication of either lack of fluid in the master cylinder; air in system, leakage at the cylinders, or the brake linings require adjustment or replacement.

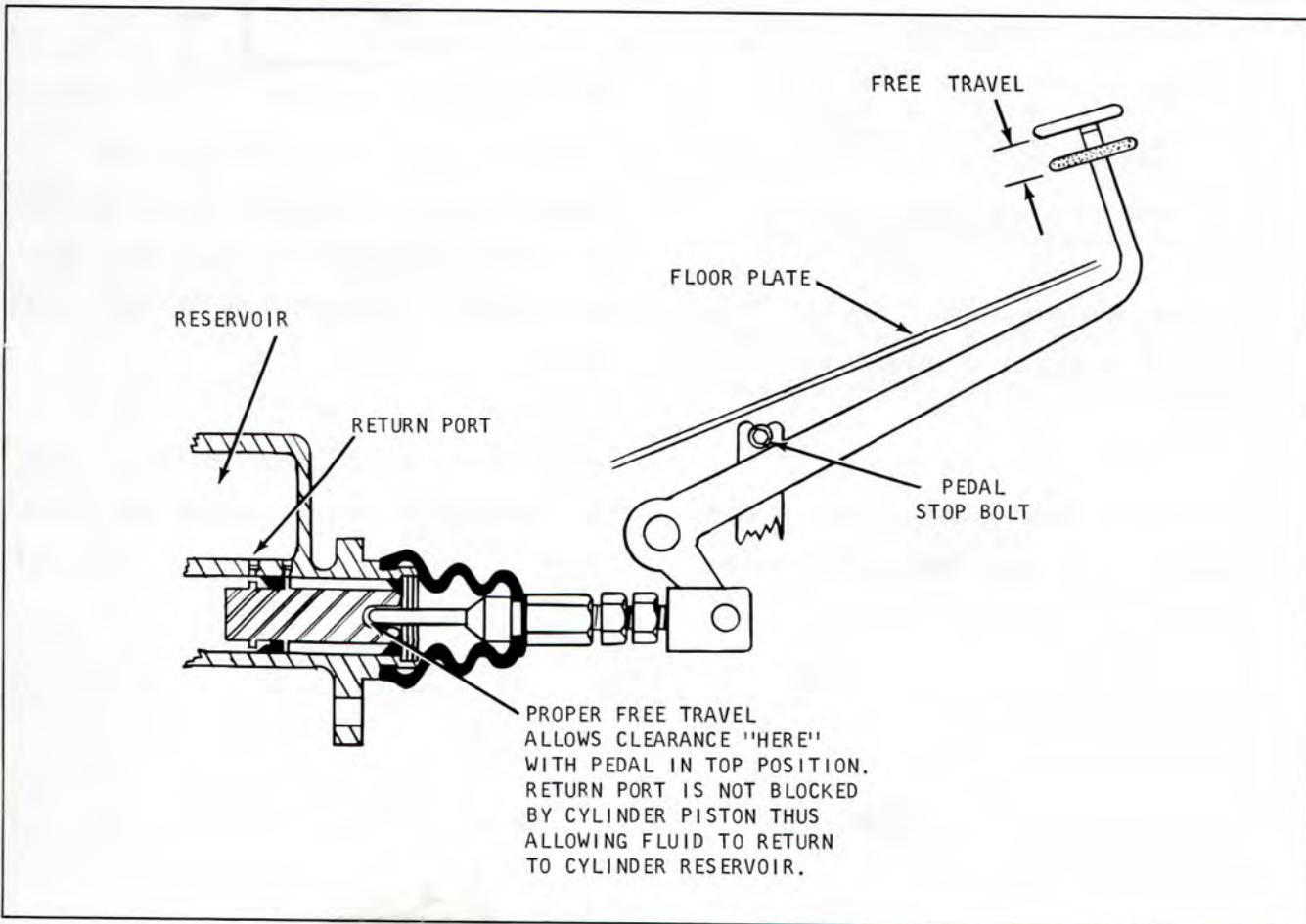


Plate 7964. Typical Brake Pedal Free Travel

**BRAKE SYSTEM**

Check brake fluid level in the master cylinder. Brake fluid should be within 1/4 inch of the top. Fill with SAE 70 R3 Heavy Duty Brake Fluid. Clark Part Number 1800200.

Master Cylinder Filler Cap Vent Hole:

Check cap vent hole for obstruction. Vent hole must be open at all times. Clean if necessary, see Plate 6987.

**BRAKE PEDAL**

A correctly adjusted brake pedal is important so that the internal ports in the master cylinder are not blocked by the cylinder piston. The following lists two important reasons for proper brake pedal free travel.

Inadequate pedal free travel will block the internal ports so that upon releasing the brake pedal fluid will be trapped in the lines and hold the brake linings in contact with the brake disc or drum, resulting in lining wear and excessive fuel consumption.

Brake Pedal Adjustment: Refer to Plate 7964 on Page 100H 302 and follow the instructions and diagrams.

**WARNING**

**CORRECT BRAKE PEDAL FREE TRAVEL IS IMPORTANT FOR SAFE OPERATING BRAKES.**

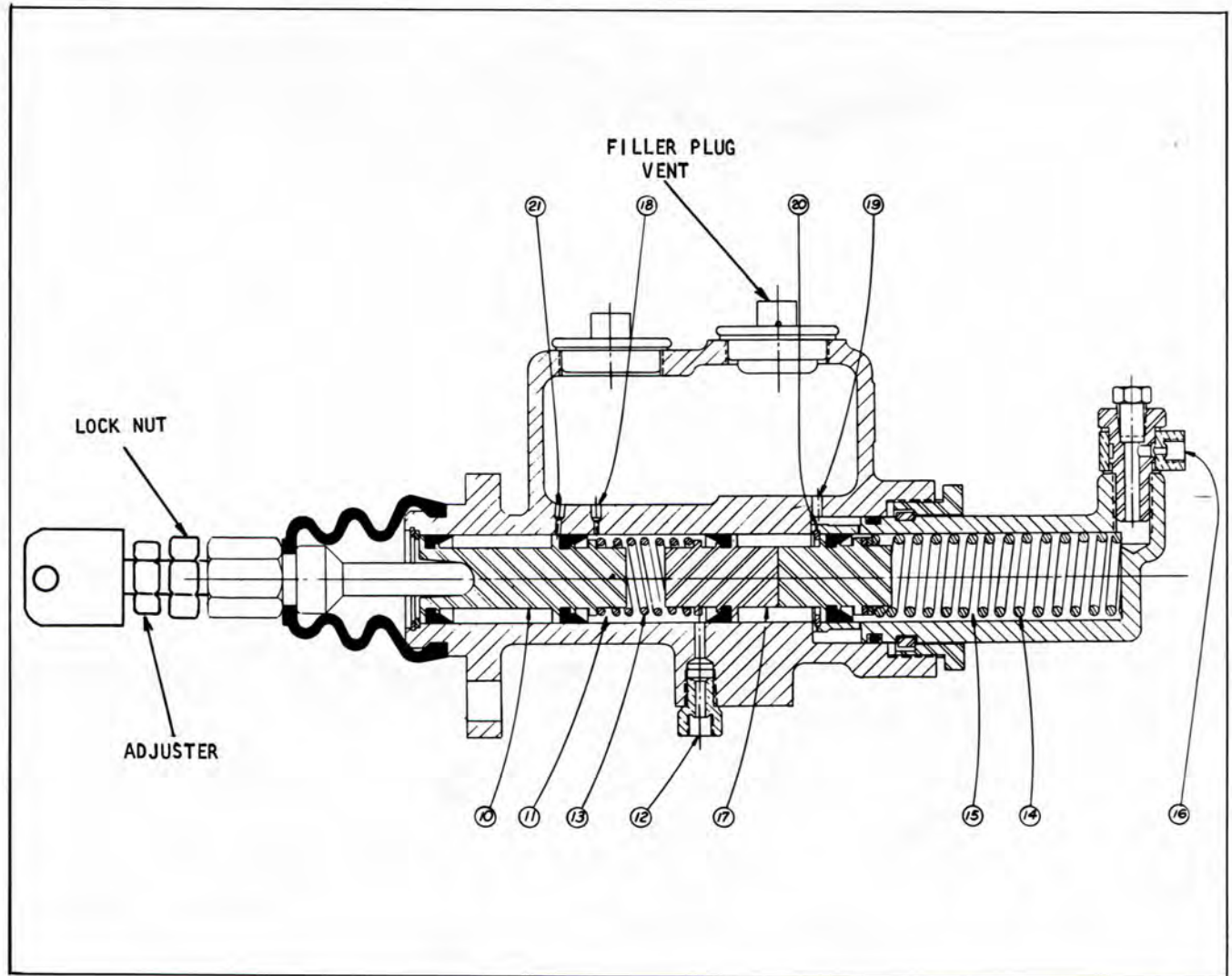


Plate 6987. Brake Pedal Adjustment

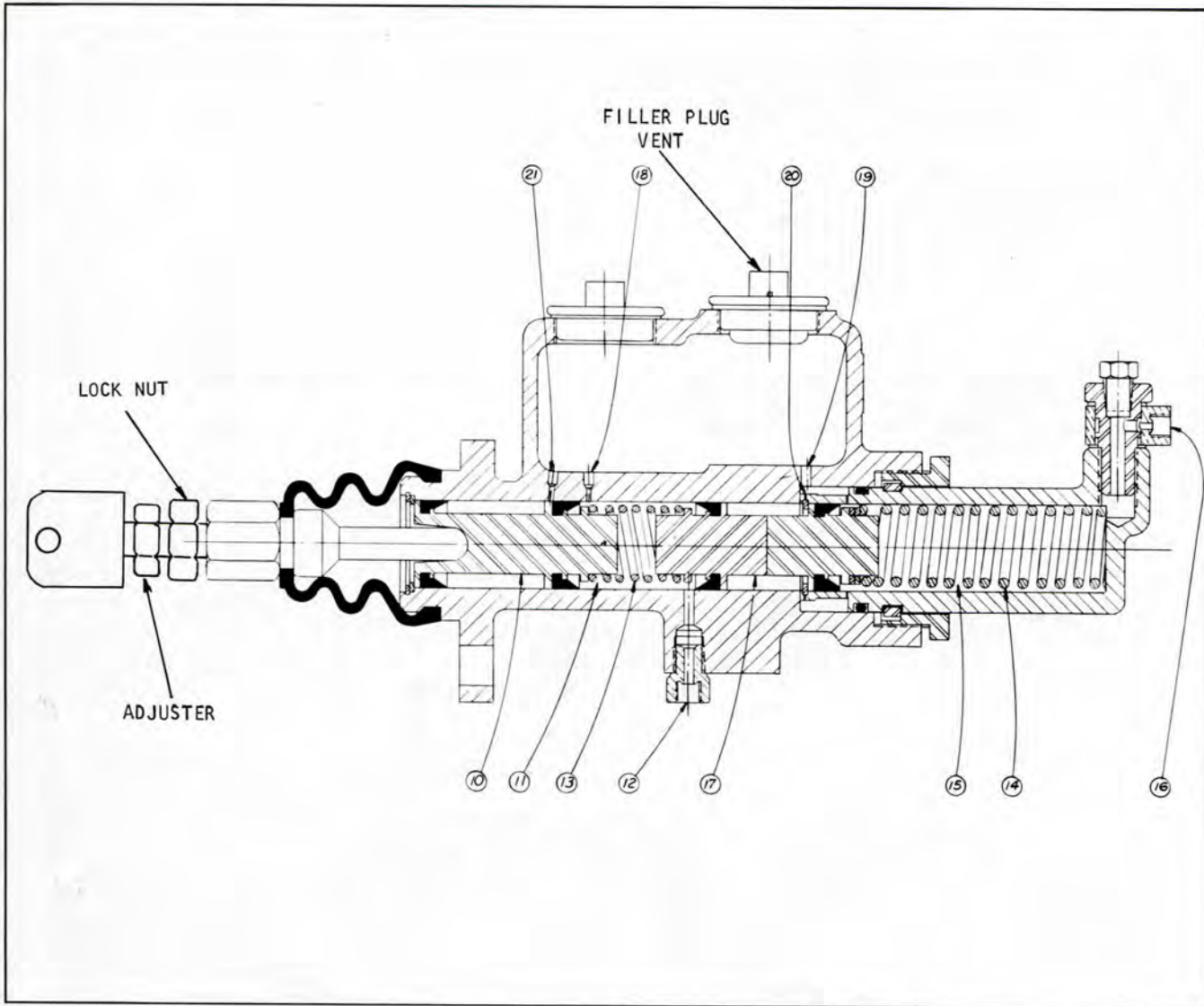


Plate 6987. Master Cylinder

The piston (10) is moved in conventional manner by linkage from the brake pedal. As this is done, oil from the cavity (11) is moved out thru port (12) to the inching control. Since spring (13) is lighter and more readily compressed than spring (14) the oil from cavity (11) will flow thru port (12) more readily and in greater volume than oil from cavity (15) thru port (16) the latter supplying the brake system.

As further motion is imparted to piston (10) from the brake pedal the pressure in (11) builds up to the pressure required for positive brake application. At this time piston (17) is caused to move further into cavity (15) thus forcing high pressure oil out of port (16) and into the brake system.

Thus it is seen that this unit provides initially, low pressure oil to actuate the inching mechanism and to partially actuate the brake mechanism, making brakes ready for immediate application, and finally, high pressure oil for complete brake actuation. In the reverse operation when brake pedal effort is released, the braking effort is removed first, and the inching effort second upon return of the brake to its normal position.

Hydraulic oil is provided to the system thru ports (18) and (19) from a conventional reservoir. Port (20) serves to vent any build up of oil pressure between the two sections of the piston (17). Port (21) serves to vent any build up of oil pressure between the two seals on piston (10).



Plate 9474. Machine Serial No. Location

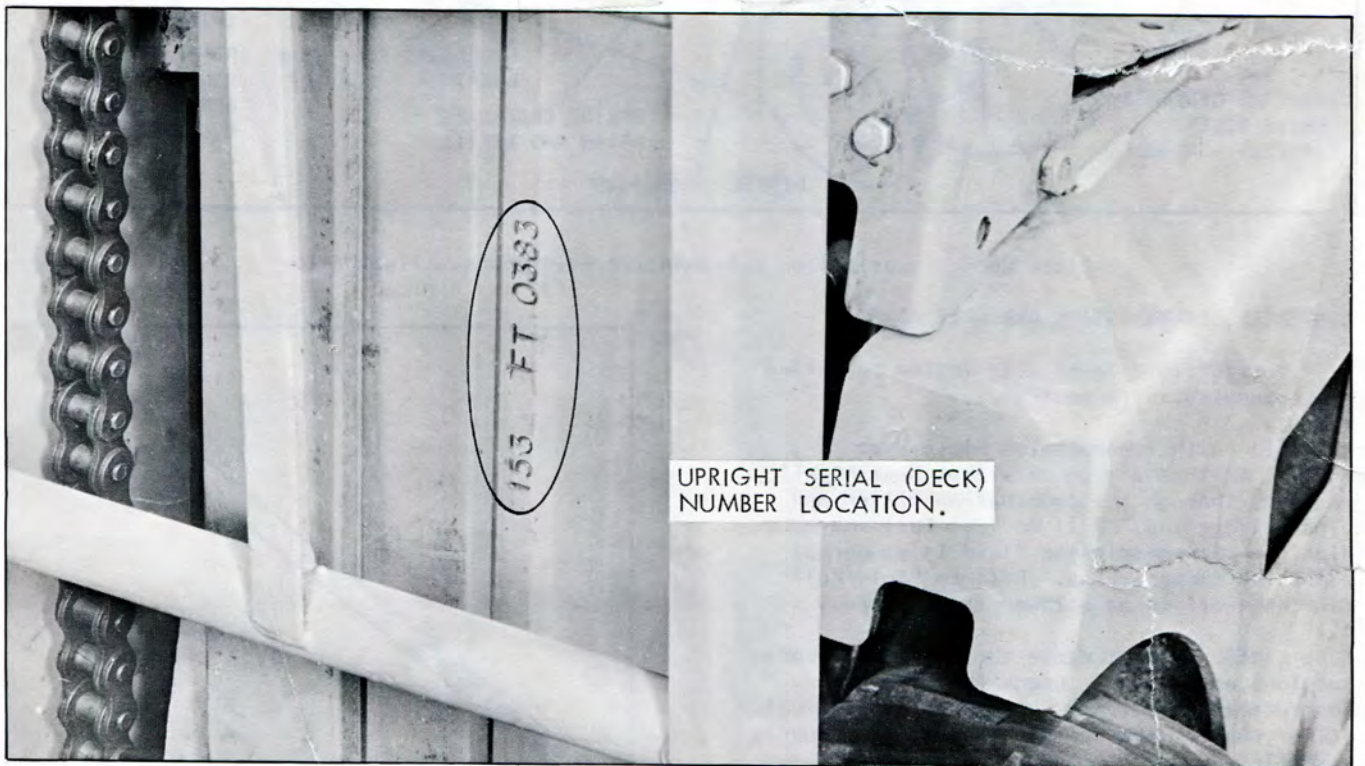


Plate 9475. Upright Serial (Deck) No. Location

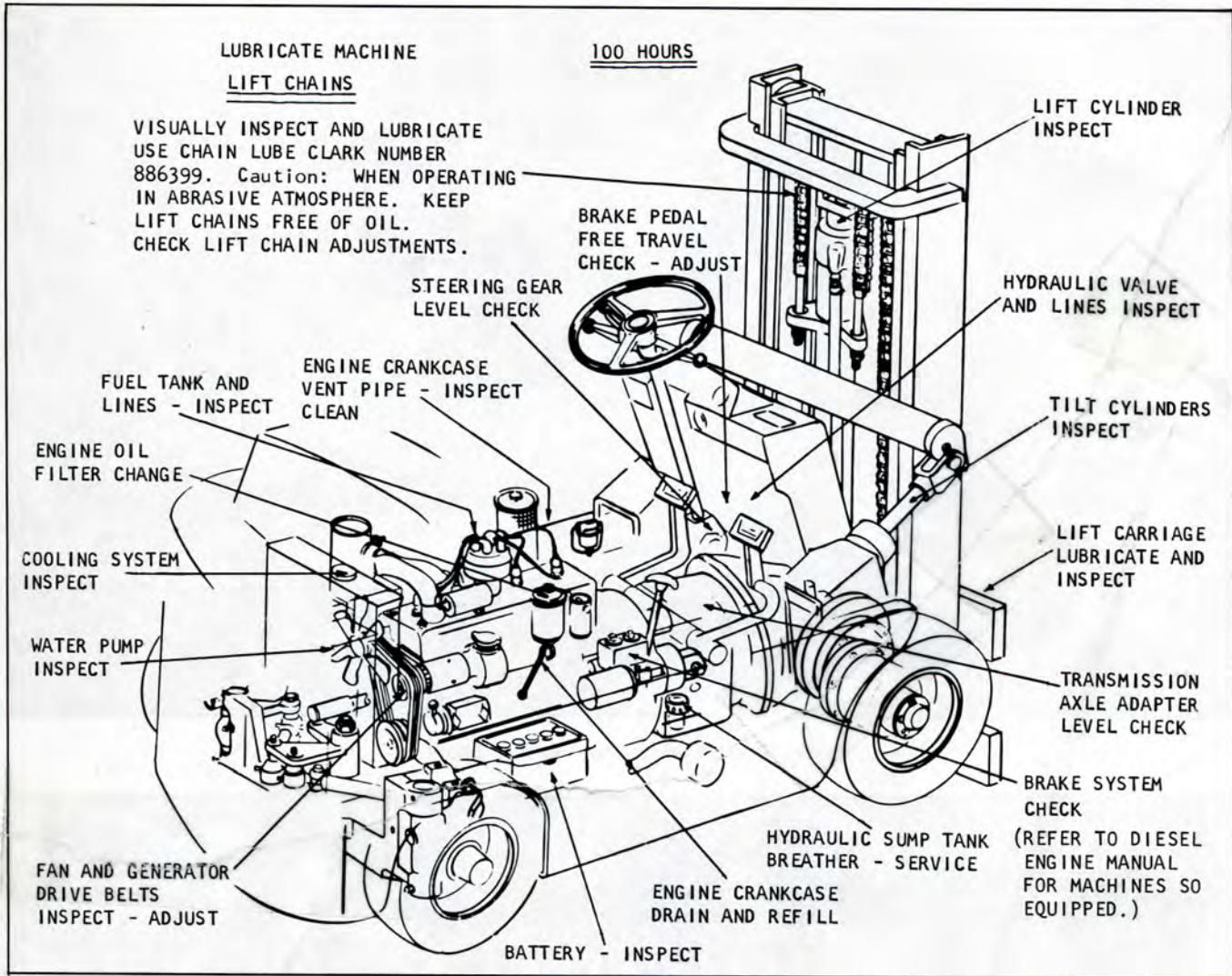


Plate 8609. Lubrication & Preventive Maintenance Illustration

CONVERTER, TRANSMISSION AND AXLE ADAPTER

Verify fluid level with engine operating and transmission in neutral.

Fill with Transmission Fluid Type "A", Suffix "A" that are in cans that have AQ-ATF on them, through the combination filler and dipstick opening. Fill to "Hot Full" mark on dipstick if transmission fluid is at normal operating temperatures. Fill to "Cold Full" mark when oil is at a lower temperature.

**FUEL LINES.** Make certain that fuel line connections are secure. Check fuel lines for obstructions and leaks. Check screen in fuel filler cap to make certain that it is properly installed.

**WARNING: NO WELDING ON FUEL TANK UNTIL CLEARED THRU AUTHORIZED PERSON IN AUTHORITY.**

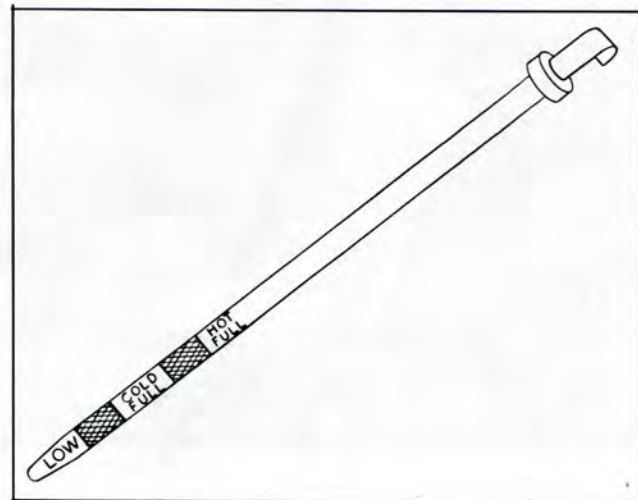


Plate 7303. Transmission Dipstick



ENGINE CRANKCASE

1. Every 100 operating hours; drain the engine crankcase at operating temperature and clean the magnetic drain plug.
2. Change the engine oil filter element. The filter is of the replaceable type. The element should be changed whenever the crankcase is drained. To remove the element, remove oil filter cover screw and gasket, oil filter cover, cover spring and cover gasket. Lift out oil filter element. Install new element after draining and thoroughly cleaning filter case. Install new element after draining and thoroughly cleaning filter case. Install new gaskets and replace cover spring, oil filter cover and secure with oil filter cover screw.

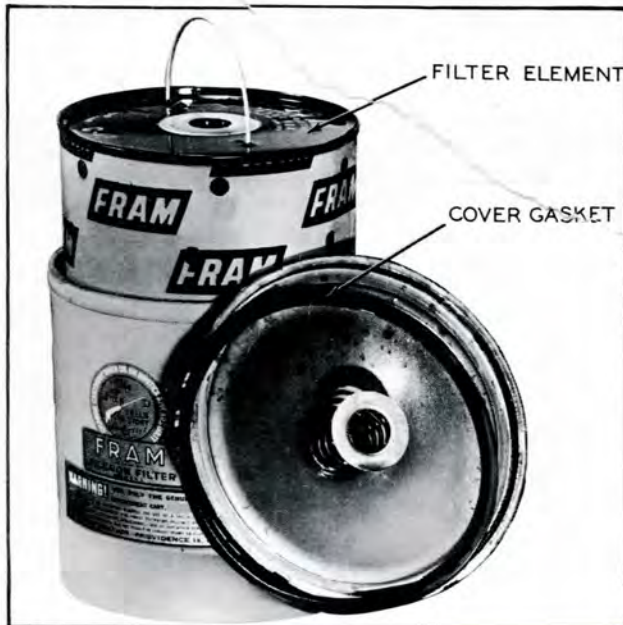


Plate 6642. Engine Oil Filter

3. Refill crankcase using recommended oil listed below. See specifications for capacity.

SAE 10W---0 deg to 32 deg F  
 SAE 20W---33 deg to 75 deg F  
 SAE 30----above 75 deg F

Low Temperature Operation

Multi-viscosity oil should be used only where cold starting conditions make it necessary. The oil supplier should assume full responsibility for satisfactory performance of the multi-viscosity oil at both low and normal engine operating temperatures.

4. Start engine and check oil filter for leaks at cover. Run engine at idle a few minutes, then

shut down engine. Allow time for engine oil to return to crankcase (approx. 5 min.) and then check oil level with the dipstick. Add oil as necessary to bring oil level to full mark on the dipstick.

Service Conditions

Oil performance will reflect engine load, temperature, fuel quality, atmospheric dirt, moisture and maintenance. Where oil performance problems arise or are anticipated, the oil supplier should be consulted. When extended drain periods are contemplated, his analysis or that of a reputable laboratory should determine the suitability of oil for further service.

Engine Crankcase Ventilation Pipe

Check crankcase ventilation pipe for damage or obstructions. The pipe must be open to provide proper ventilation. Clean, repair or replace as required.

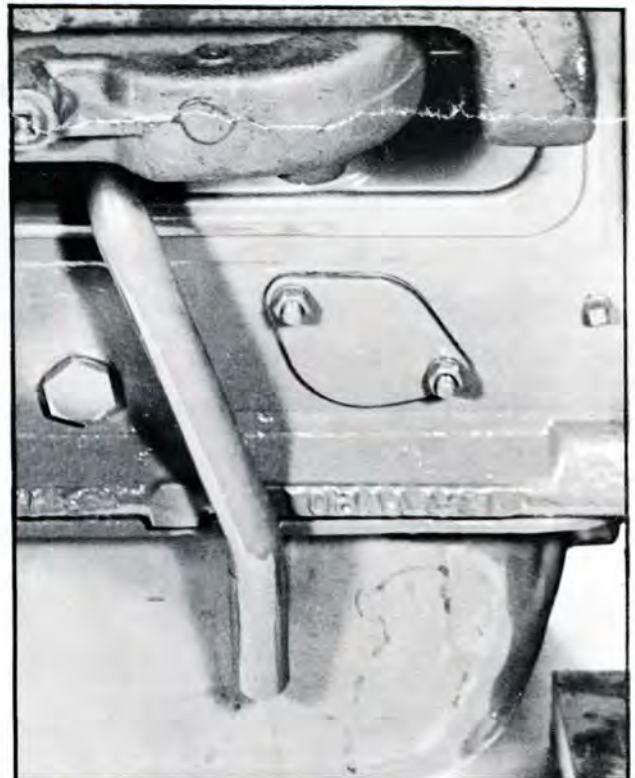


Plate 6628. Crankcase Vent Pipe

**N O T E**

Refer to Diesel Engine Manual for Machines So Equipped.

**COOLING SYSTEM**

Check radiator, hoses and water pump for leaks.

Add proper amount of water or anti-freeze solution to cooling system. If anti-freeze is not available and machine is to be at rest for an appreciable length of time, drain system when temperature is likely to be 32° F, or lower. If water is added to radiator containing anti-freeze solution, always test solution in radiator with a hydrometer to determine the degree of protection. For proper amount of anti-freeze solution required to protect the cooling system, refer to instructions on anti-freeze container.

**N O T E**

**COOLING SYSTEM CAPACITY - REFER TO SPECIFICATIONS.**

Accumulated foreign material should be blown from radiator fins with compressed air. Direct air stream through radiator fins towards engine to make this process effective.



Plate 6458. Radiator Pressure Cap

**W A R N I N G**

USE EXTREME CARE IN REMOVING THE RADIATOR PRESSURE CAP. IN PRESSURE SYSTEMS, THE SUDDEN RELEASE OF PRESSURE CAN CAUSE A STEAM FLASH AND THE FLASH, OR THE LOOSENED CAP CAN CAUSE SERIOUS PERSONAL INJURY. LOOSEN CAP SLOWLY AND ALLOW STEAM TO ESCAPE. THIS MACHINE IS EQUIPPED WITH A 7 LB PRESSURE CAP.



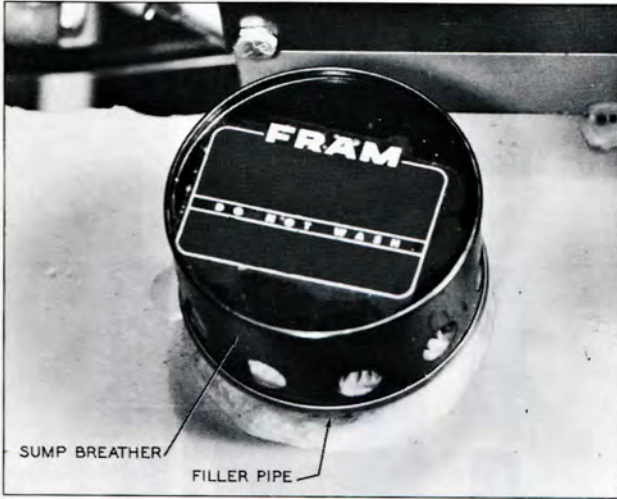


Plate 6626. Hydraulic Sump Tank

**HYDRAULIC SUMP TANK BREATHER**

Check breather to be sure it not dirty or clogged with foreign matter. Replace breather if dirty.



Plate 6682. Hydraulic Sump Tank & Sump Breather

**BATTERY INSPECTION**

Remove all caps and check fluid level. Keep the fluid in each battery cell above the plates or up to the level ring in the bottom of the filler well. Use only pure distilled water. If the machine is exposed to freezing temperatures, operate the engine for a period of time to make sure the added water mixes thoroughly with the battery electrolyte solution. Otherwise, the water may freeze and damage the battery.

x  
x  
x                      W A R N I N G                      x  
x                      x                      x  
x NEVER ALLOW FLAME OR SPARKS NEAR THE                      x  
x                      x                      x  
x BATTERY FILLER HOLES BECAUSE EXPLOSIVE                      x  
x                      x                      x  
x HYDROGEN GAS MAY BE PRESENT.                      x  
x                      x                      x  
x x

Take hydrometer reading of electrolyte to determine state of charge. Charge battery if reading is below 1.225 at 24 deg. C (75 deg. F), or below 1.265, if machine is exposed to freezing temperatures. If machine is operating in tropical areas in which freezing weather is not encountered, the full charge specific gravity reading may be lowered from 1.375 to 1.225 by diluting the electrolyte with distilled water.

**N O T E**

Add distilled water before charging. Do not add distilled water immediately after a charge.

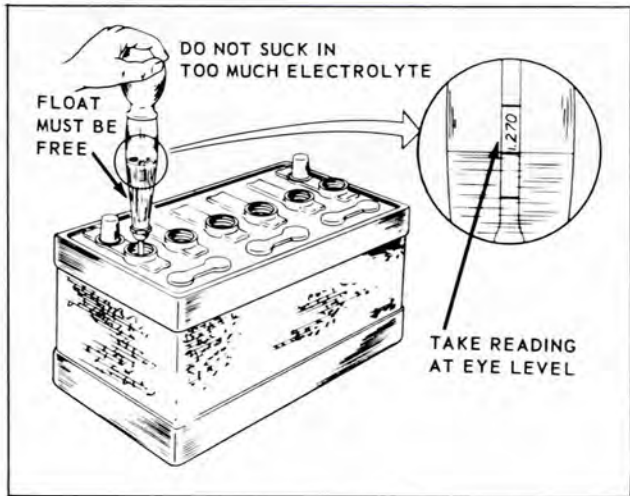


Plate 6271. Checking Specific Gravity of Battery

Make sure that all connections are tight at battery, starter, generator/alternator voltage

regulator, distributor and spark plugs. Corrosion can be removed from the battery cables and terminals with a solution of baking soda or ammonia and water. After cleaning, flush the top of the battery with clean water, and coat the parts with grease to retard further corrosion.

**BATTERY TEST PROCEDURE**

A defective battery or a discharged battery may be found by performing the following "Light Load Test".

1. Place an electrical load on the battery by cranking the engine for three seconds. If it starts, turn the ignition off immediately.
2. Place a 10 ampere load across the battery terminals for one minute. This will condition the battery so an accurate voltage comparison test can be made between cells. (Connecting two headlights turned on low beam will equal the 10 ampere load - this method may be used in place of the load placed across the terminals.)

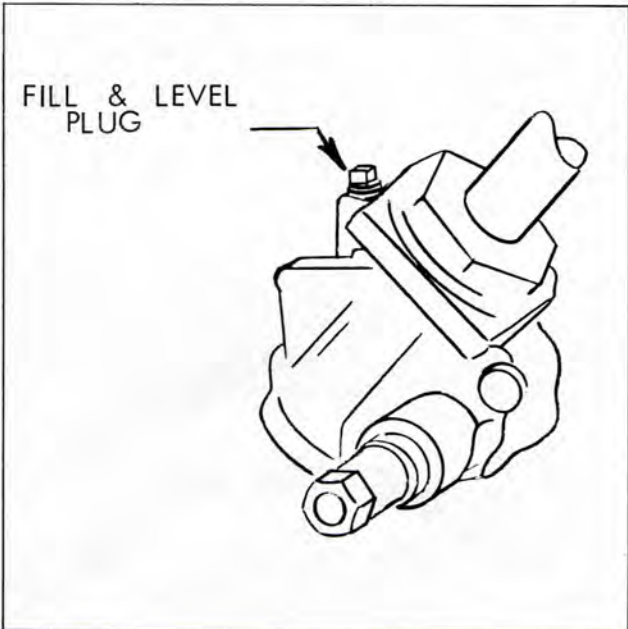


Plate 6429. Typical Steering Gear

**STEERING GEAR**

The steering gear is prepacked with grease at the factory and should not require lubrication until disassembled for repair. However, it is recommended that periodically the gear be checked for proper lubricant level, and filled if necessary with NLGI #1 (amolith grease EP #1 or its equivalent).

3. After one minute, and with the 10 ampere load still on the battery, check the individual cells with an expanded scale voltmeter.



Plate 8306.

4. Place the positive voltmeter prod on the positive side of the cell and the other prod on the negative side. A good battery, sufficiently charged will read 1.95 volts or more on each cell with a difference of less than .05 volt between highest and lowest cell.

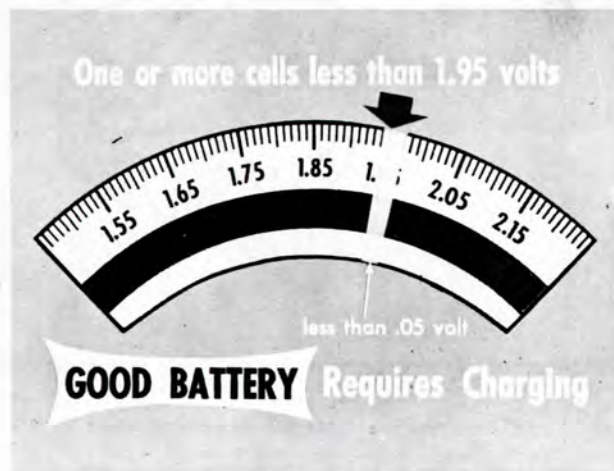


Plate 8307.

5. If cells read both above and below 1.95 volts and the difference between highest and lowest cell is less than .05 volt, battery is good but requires charging.

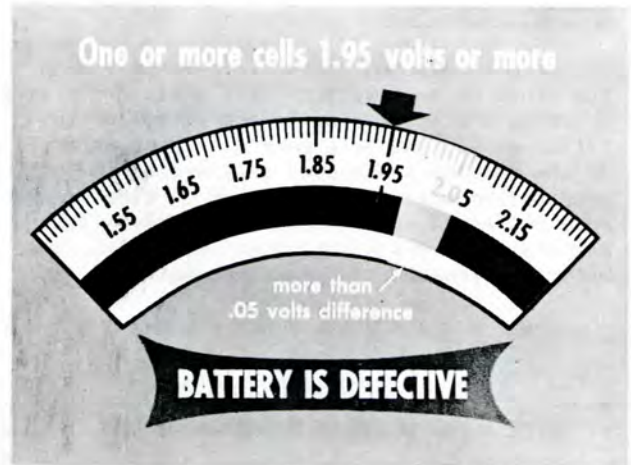


Plate 8308.

6. If any cell reads 1.95 volts or more and there is a difference of .05 volt or more between the highest and lowest cell, the battery is defective.

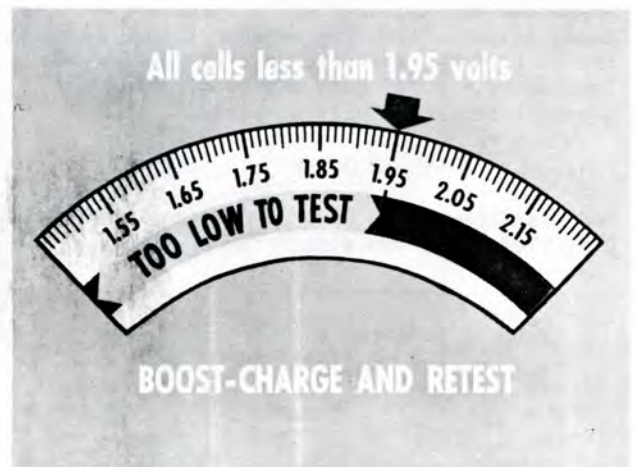
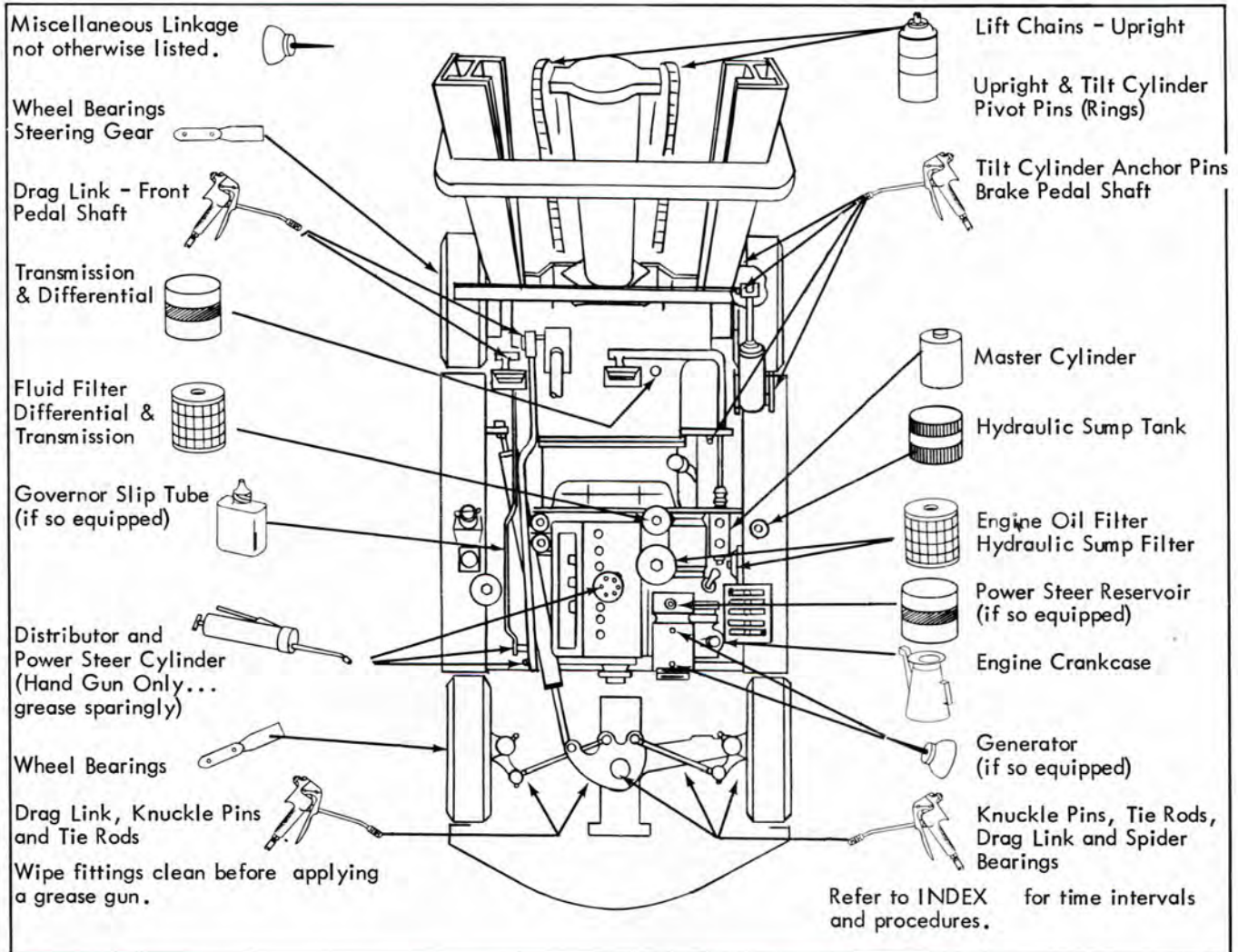


Plate 8309.

7. If all cells read less than 1.95 volts, battery is too low to test accurately. Boost-charge and repeat light load test.



Chassis Grease (pressure gun).  
(use NLGI #2).

Steer Cylinder Ball Stud (NLGI #2)  
Chassis Grease (hand gun only).

Engine Oil: S.A.E. #20.

Oil Filter Cartridge Kit.

Hydraulic Brake Fluid (Heavy Duty)  
SAE 70R 3...Clark #1800200.

DEXRON Automatic Transmission Fluid  
or if available...use...  
#879803 Automatic Transmission  
Fluid Type "A", Suffix "A" ...  
cans must be prefixed AQ-ATF.

Hydraulic Fluid...Clark #885385  
Clark Specifications MS-68.

Engine Crankcase...SERVICE "MS"  
SAE 10W 0 deg to 32 deg F.  
SAE 20W 32 deg to 75 deg F.  
SAE 30 above 75 deg F.

Machines equipped with Governor  
slip tube...use Graphite Grease.

Chain Lube ... Clark #886399.

Wheel Bearing Grease...  
::: NLGI #1 multi-purpose grease.

Axle Ends...NLGI #1 multi-purpose  
grease. CLARK Spec. MS-107

CHART  
KEY.



# INDUSTRIAL TRUCK DIVISION



INDUSTRIAL TRUCK DIVISION



Technical specifications and descriptions for the truck chassis components, including axle types, suspension details, and steering mechanisms. The text is organized into sections corresponding to the labeled parts in the diagram.

**Front Axle (A):** Description of the front axle assembly, including the axle tube, hub, and wheel mounting details.

**Rear Axle (B):** Description of the rear axle assembly, including the axle tube, hub, and differential components.

**Suspension (C, D):** Description of the front and rear suspension systems, including the shock absorbers, springs, and control arms.

**Steering (E, F):** Description of the steering mechanism, including the steering knuckle, tie rods, and steering rack.

**Drivetrain (G, H):** Description of the drivetrain components, including the transmission, drive shaft, and axle shafts.

**Chassis (I, J):** Description of the chassis frame and mounting points for the various components.





# INDUSTRIAL TRUCK DIVISION



LUBRICATION AND PREVENTIVE MAINTENANCE

## FOUNDRY SPECIAL INSPECTION AND SERVICE INTERVAL CHECK LIST

	HOURS					
	8	50	100	250	500	1000
ENGINE OIL - CHECK LEVEL DRAIN & REFILL REPLACE FILTER	X	X				
ENGINE AIR FILTER - PRECLEANER BOWL - EMPTY DUST CUP - END COVER - EMPTY FILTER - CLEAN (CLEAN MORE FREQUENTLY IF RESTRICTION INDICATOR IS IN RED ZONE) FILTER - REPLACE	X		X			X
RADIATOR COOLANT LEVEL - CHECK BATTERY WATER LEVEL - CHECK	X		X			
TRANSMISSION OIL LEVEL - CHECK REPLACE FILTER ELEMENT DRAIN OIL, CLEAN SUMP SCREEN & REFILL	X			X	X	
CRANKCASE VENTILATION - COLLECTOR JAR - EMPTY VAPOR FILTER ELEMENT - REPLACE CHECK VALVE - CLEAN CRANKCASE BREATHER FILTER - CLEAN CRANKCASE BREATHER FILTER - REPLACE		X		X	X	X
SUMP TANK - BREATHER FILTER - CLEAN - REPLACE INTAKE SCREEN - CLEAN OR REPLACE CHANGE OIL & FLUSH HYDRAULIC OIL SYSTEM		X			X	X
HYDRAULIC OIL RETURN LINE FILTER - REPLACE ELEMENT WHEN INDICATOR GAUGE POINTS TO RED ZONE OR AS INDICATED ON FILTER DECAL. (CHECK AT IDLE SPEED WITH OIL HOT) (APPROX.)					X	
POWER STEERING - FILLER CAP - REPLACE DRAIN OIL, FLUSH COMPLETE SYSTEM, ADD OIL ROD WIPER - REPLACE						X
LIFT & TILT CYLINDER ROD WIPER (URETHANE) REPLACE BRAKE MASTER CYLINDER BREATHER FILTER - CLEAN					X	X

NOTE - SEE TRUCK OPERATORS MANUAL FOR ADDITIONAL INSPECTION & SERVICE RECOMMENDATIONS



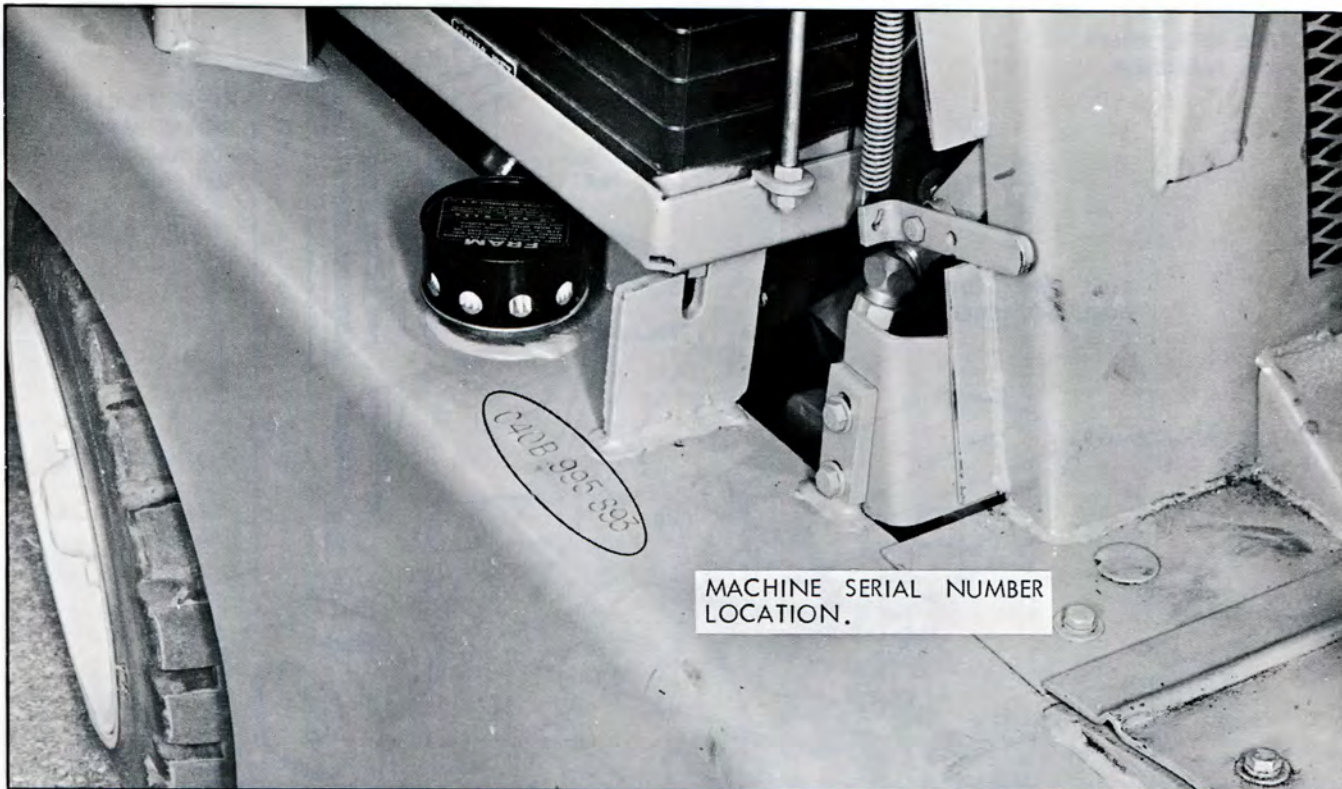


Plate 9474. Machine Serial No. Location

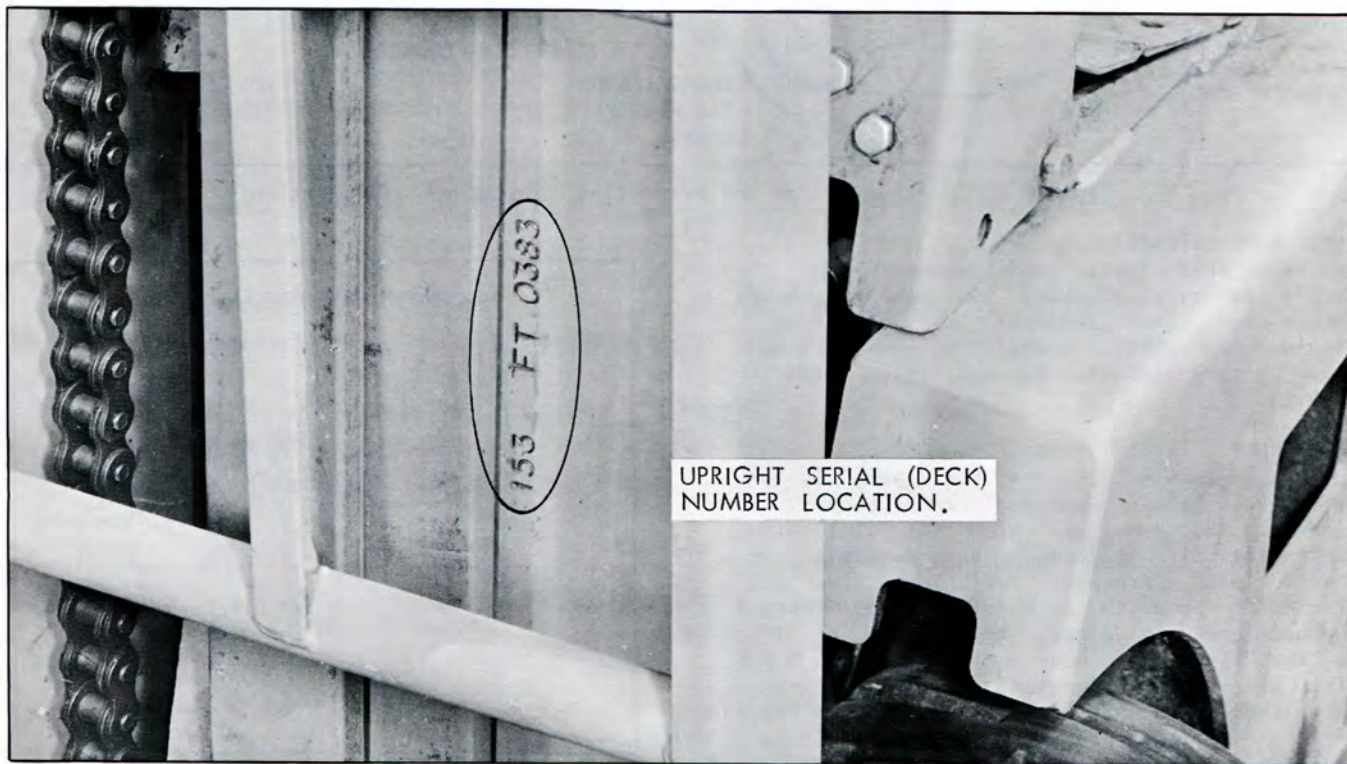


Plate 9475. Upright Serial (Deck) No. Location

LUBRICATION AND PREVENTIVE MAINTENANCE

500 HOURS

STEAM CLEAN MACHINE

CHECK SECURITY OF ALL NUTS, BOLTS, AND CAPSCREWS.

TRANSMISSION AND DIFFERENTIAL DRAIN - CLEAN SCREEN AND REFILL - USE AUTOMATIC TRANSMISSION FLUID TYPE "A" SUFFIX "A" -----CLARK PART NUMBER 879803

NOTE  
REFER TO DIESEL ENGINE MANUAL FOR MACHINES SO EQUIPPED.

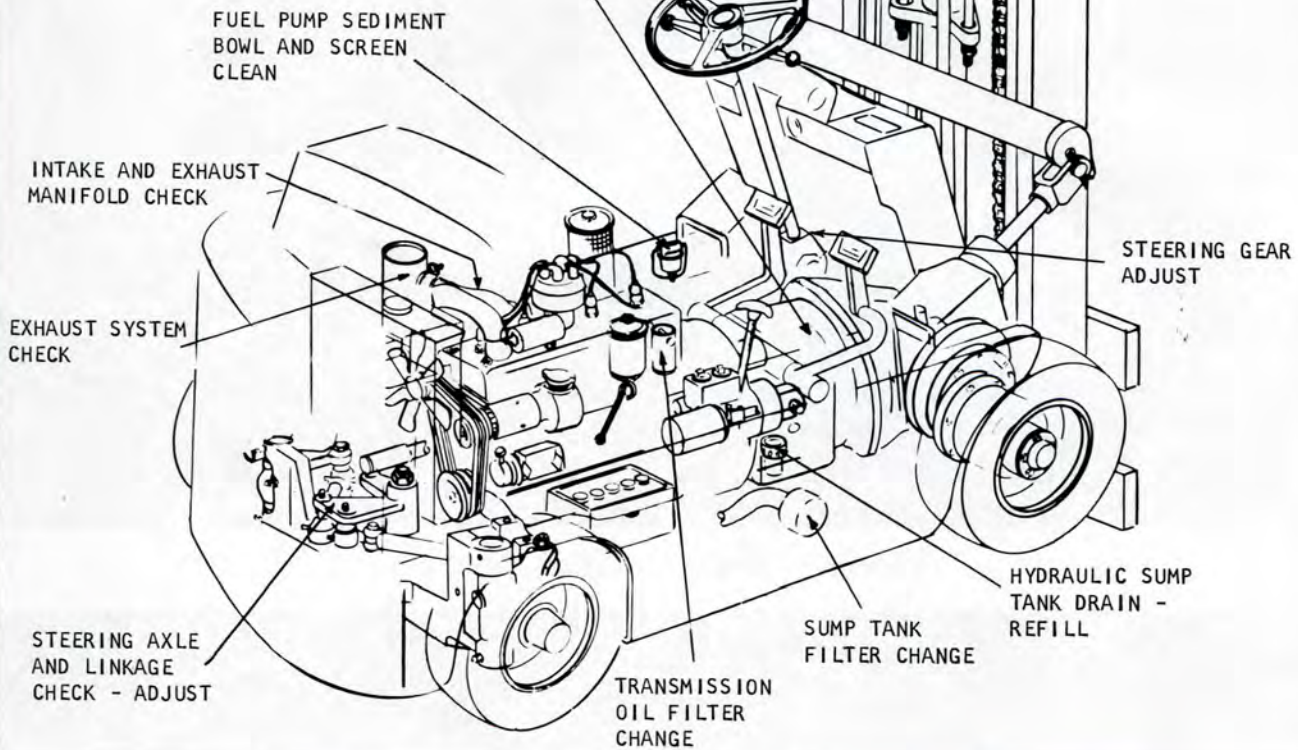


Plate 8612. Lubrication and Preventive Maintenance Illustration

**FUEL PUMP STRAINER**

The fuel filter and sediment bowl should be cleaned every 500 operating hours. Remove and clean sediment bowl. If fuel strainer is dirty, install a new strainer assembly and gasket. Do not reuse old gasket.

**FUEL PUMP**

To determine if the fuel pump is defective, remove the fuel tank supply line at the pump and blow out line with compressed air to remove any possible obstructions. Reconnect fuel tank line and disconnect pump to carburetor line. Install a fuel pressure gauge, by placing a "T" in the line, and run engine at 1800 R.P.M. with all lines connected. Fuel pump pressure should be between 1 1/2 and 2 1/4 lbs. If the fuel pump pressure is not within this range the pump should be removed for repair or replacement. CAUTION: TO MINIMIZE ANY POSSIBLE FIRE HAZARD. DO NOT SPILL GASOLINE.

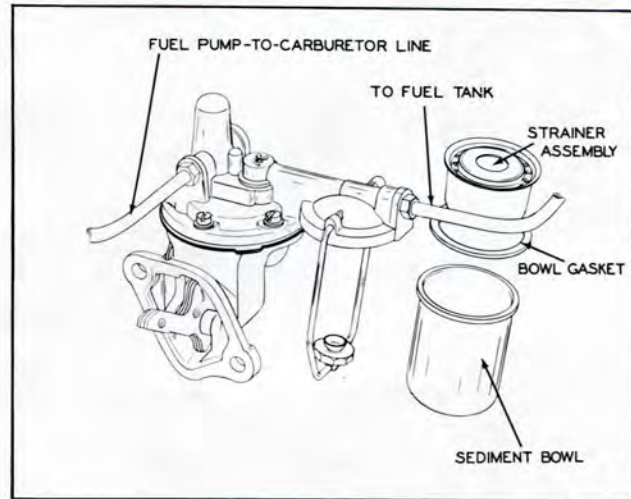


Plate 6432. Fuel Pump & Sediment Bowl

Transmission Filter (Hydratork Models)

Install new element every 500 operating hours.

1. Remove cover retainer, cover, gasket and spring.
2. Thoroughly clean filter body.
3. Install new element.
4. Install new cover gasket and cover.
5. Secure cover in place with retainer.

I M P O R T A N T

A new element should be installed any time the fluid is changed and...when a repair is made on the transmission or axle adapter.

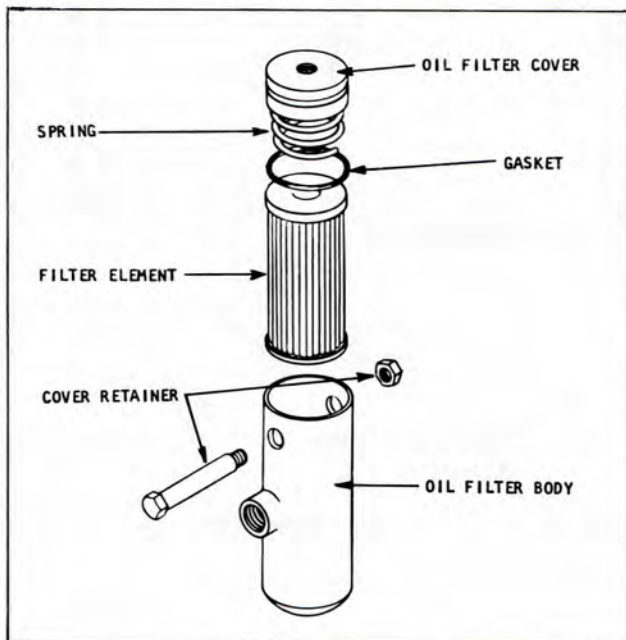


Plate 7234. Transmission Filter (typical)

Converter...Axle Adapter and Transmission Reservoir Screen (Hydratork Models)

1. Drain fluid at operating temperatures...refer to next page, Plate 7301.

C A U T I O N

DO NOT USE FLUSHING OIL OR COMPOUND TO FLUSH SYSTEM.

2. Remove and clean sump screen in a Stoddard type cleaning solvent...dry with filtered compressed air...directing air thru neck of screen.



Plate 7235. Transmission Screen (typical)

3. Install new O-ring as shown above...Plate 7235.
4. Refill to full mark indicated on transmission dipstick...use Automatic Transmission Fluid, Type "A", Suffix "A"...number to be prefixed by AQ-ATF on container...or use DEXRON Automatic Transmission Fluid.
5. Operate engine to completely charge the converter and plumbing with fluid...then recheck fluid level...with engine running, transmission in neutral, and fluid at operating temperature.

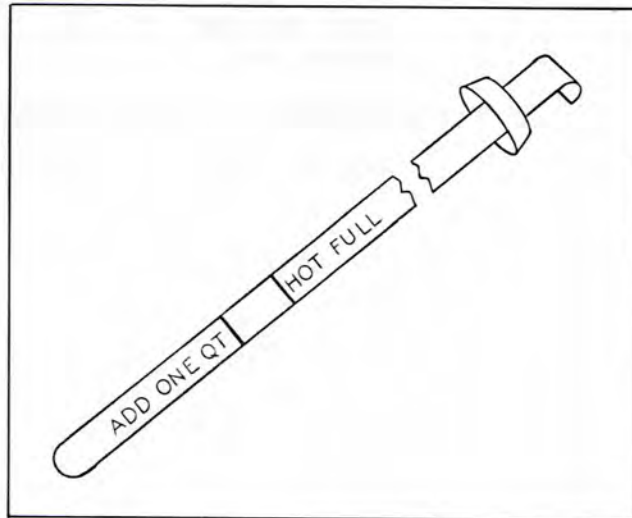


Plate 8281. Transmission Dipstick (Typical illustration)

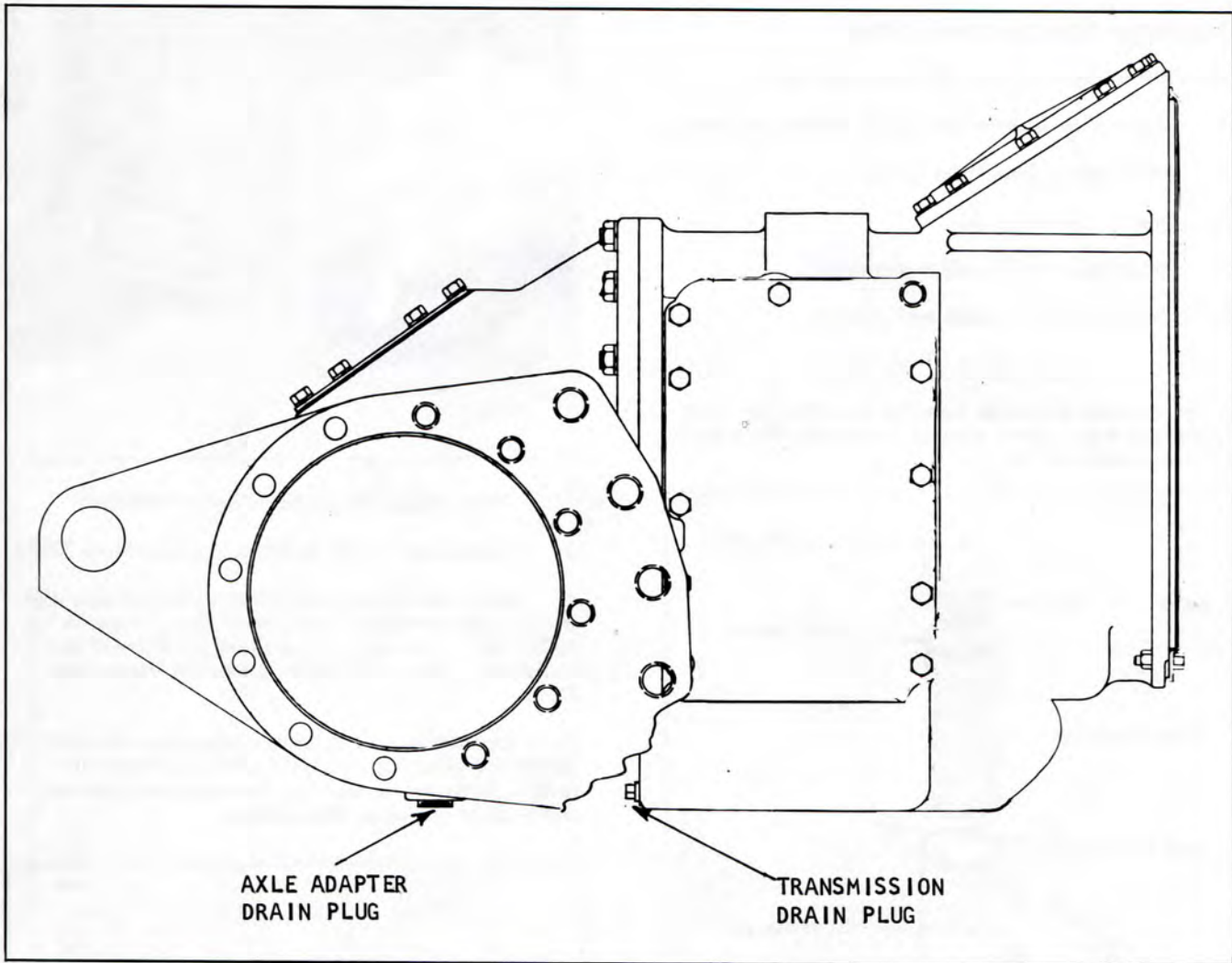


Plate 7301. Axle Adapter and Transmission Drain Plugs

HYDRAULIC SUMP TANK AND  
SUMP OIL FILTER

CAUTION

THE HYDRAULIC SYSTEM MUST BE KEPT CLEAN. IT MAY BE NECESSARY TO DRAIN, CLEAN AND REFILL THE SUMP TANK MORE OFTEN UNDER ADVERSE CONDITIONS. THIS IS BEST DETERMINED BY CHECKING CONDITION OF THE HYDRAULIC FLUID FOR EVIDENCE OF DIRT, SLUDGE OR ANY FOREIGN MATTER AT PERIODIC INTERVALS.

1. Lower upright. Shut engine off.
2. Place a large container underneath the sump tank which is located at the right side of machine.

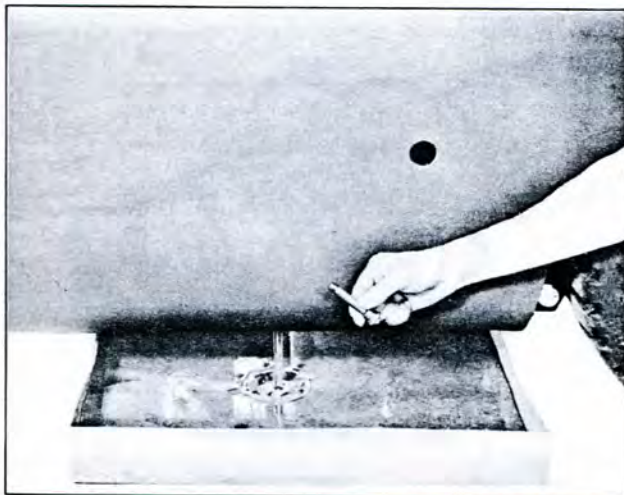


Plate 5359. Draining Sump Tank

3. Remove sump tank drain plug, located at bottom of tank, and allow the fluid to drain. Replace drain plug.

CAUTION

DO NOT START ENGINE WHILE SUMP TANK IS EMPTY AS DAMAGE TO THE HYDRAULIC PUMP WILL RESULT.

4. Remove Filter and Clean Sump Tank:
  - a. Disconnect hose and remove filter retainer bolts.

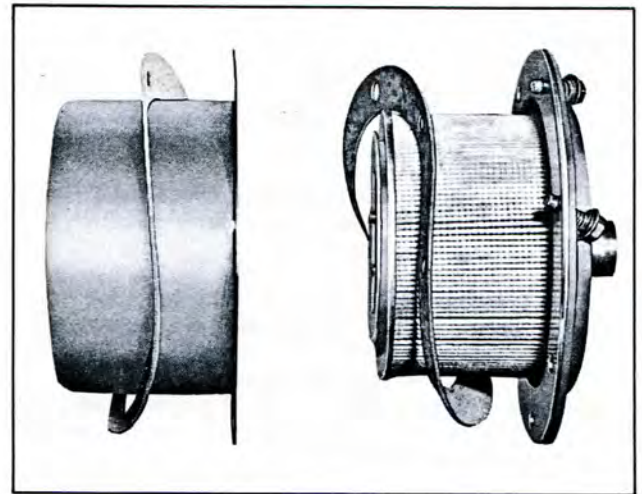


Plate 5274. Sump Tank Oil Filter Components

- b. Pull filter assembly out of sump tank.
- c. Remove any remaining gasket material from mounting flange.
- d. Before installing a new filter and gasket, be sure sump tank is absolutely clean. Flush sump tank with two quarts of clean hydraulic oil.

NOTE

THE FILTER ATTACHING BOLTS SHOULD BE TIGHTENED TO 40 TO 50 INCH POUNDS. IF THIS TORQUE IS EXCEEDED, DISTORTION MAY OCCUR, CAUSING LEAKAGE.

- f. Install hose and tighten hose connections.

5. Fill sump tank with MS 68 Hydraulic fluid until level reaches the bottom of the fill pipe.

CAUTION

START ENGINE AND OPERATE HYDRAULIC CONTROL LEVERS SEVERAL TIMES, CHECK OIL FILTER FOR LEAKS, RECHECK OIL LEVEL AND FILL TO BOTTOM OF FILL PIPE IF NECESSARY.

STEERING GEAR

Steering gear adjustments must be made in the following manner (see Plates 6636 and 6637).

Always check worm bearing thrust adjustment, and adjust if necessary, before making sector gear lash adjustment.

Before making above adjustments, the following preliminary operations are necessary.

1. Disconnect steering drag link from pitman arm. Note relative position of drag link parts when disconnecting link so the parts may be re-assembled correctly.
2. Check lubricant level in steering gear housing. If low, add enough lubricant to bring level up to filler plug hole. (Use NLGI #1 Amolith grease EP #1 or its equivalent).
3. Tighten steering gear housing to frame side member bolts, see Plate 6636.
4. Determine straight-ahead position of steering mechanism by turning steering wheel to extreme right.

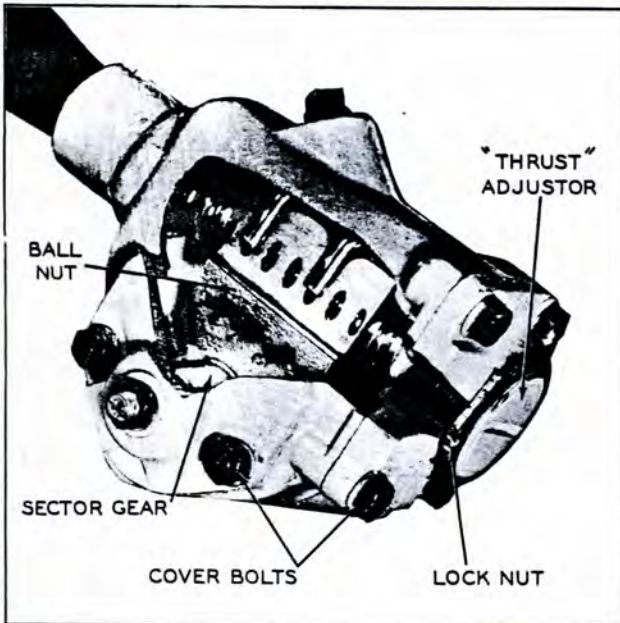


Plate 6636. Steering Gear Thrust Adjustment (Worm Bearings)

C A U T I O N

APPROACH EXTREME ENDS CAUTIOUSLY; WORM BALL NUT MUST NOT STRIKE ENDS WITH ANY DEGREE OF FORCE.

Then turn to extreme left, counting the exact number of turns from right to left end. Turn wheel back one-half number of wheel turns. Mark wheel with respect to steering column so center position may readily be found during adjustment procedures.

Worm Bearing THRUST Adjustment: Refer to Plate 6636 and proceed as follows:

1. Check tightness of cover bolts, see Plate 6636. Loosen lock nut and turn lash adjuster screw (Plate 6637) counterclockwise a few turns to provide clearance between sector gear and worm ball nut.

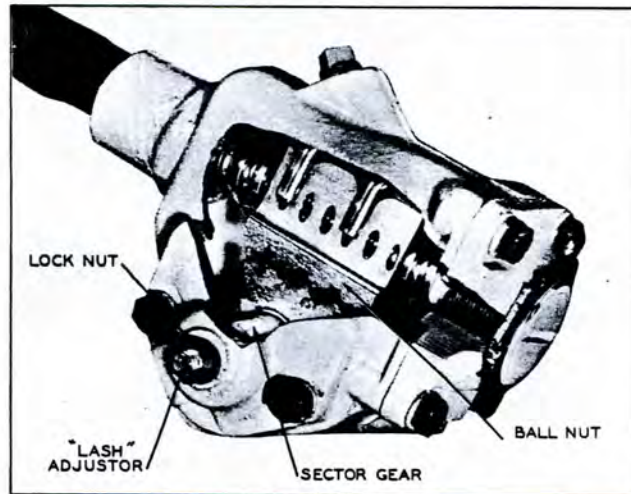


Plate 6637. Steering Gear Lash Adjustment (Sector Gear)

2. Turn steering wheel GENTLY to one extreme end. Turn wheel back one full turn. With spring scale on spoke of wheel, measure pull required to KEEP WHEEL MOVING. Pull on scale should be made at right angles to wheel spoke. If pull is within 1 1/2 to 2 pounds, proceed to lash adjustment in the following paragraphs. If pull is not within 1 1/2 to 2 pounds, adjust worm bearings. The pitman shaft adjustment must be made if worm bearing check is accomplished, or if the worm bearings are adjusted.

3. If it is necessary to adjust the worm bearings, loosen lock nut and then turn worm bearing adjuster nut clockwise until all end play is removed, see Plate 6636. Using



spring scale, as directed in Step 2, check pull and readjust as necessary; then tighten lock nut securely.

Sector Gear Lash Adjustment: Refer to Plate 6637 and proceed as follows:

1. Steering Gear Mechanism must be in straight ahead position as previously explained.
2. Turn lash adjuster screw clockwise to remove all lash between gear teeth. Tighten adjuster screw lock nut. Position spring scale on steering wheel so pull may be made at right angles to wheel spoke.
3. Measure pull while wheel is TURNED THROUGH CENTER POSITION. Readjust if reading is not within 2 1/2 to 3 pounds.
4. Tighten adjuster screw lock nut, check pull again.
5. After adjustments are made, install drag link on pitman arm.

N O T E

If steering linkage adjustment is necessary do not install drag link to pitman arm.

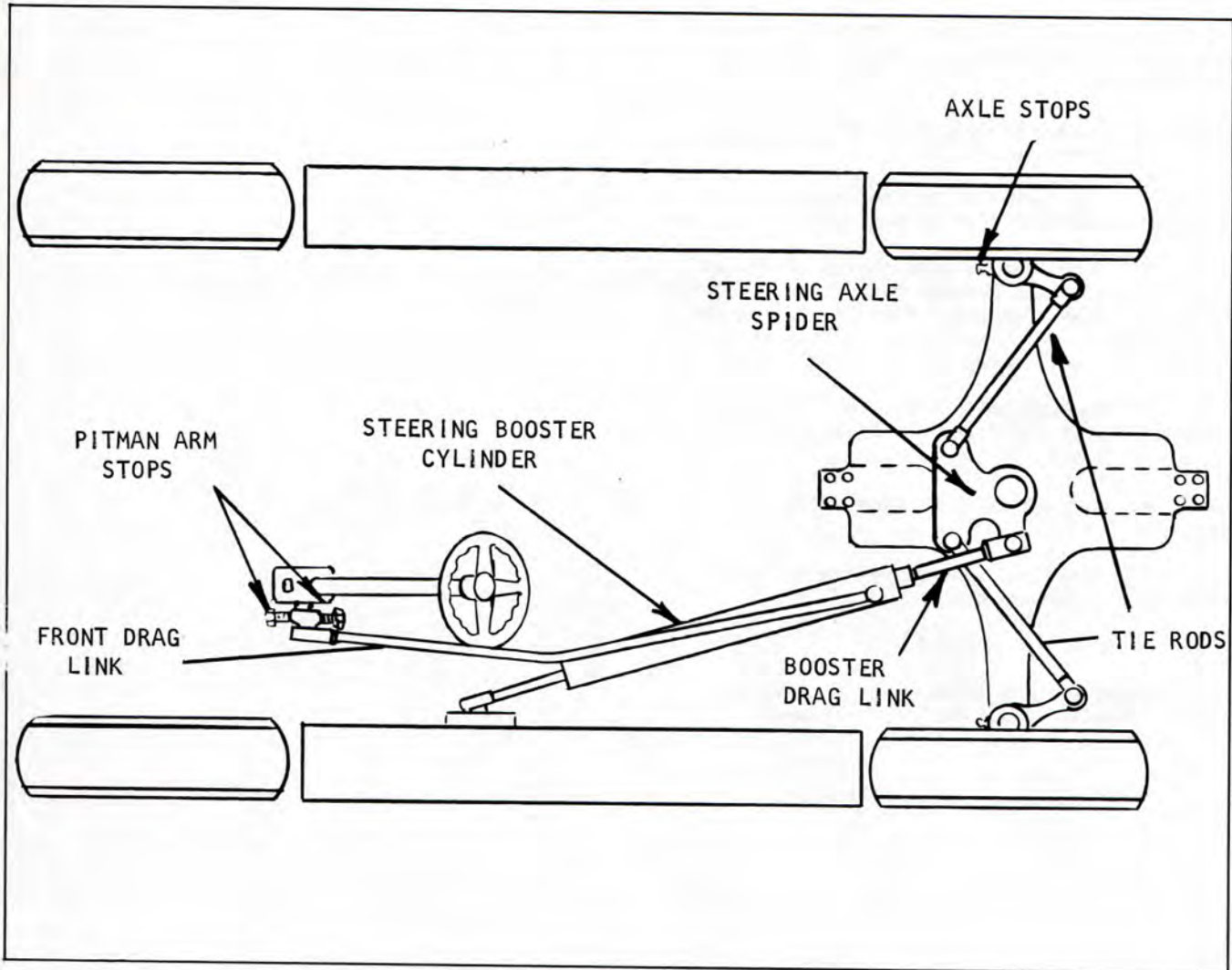


Plate 7340. Steering Linkage

**STEERING AXLE AND LINKAGE ADJUSTMENTS**

1. Raise the steering wheels far enough to clear the floor and place heavy blocking under the machine frame so it cannot accidentally become lowered during adjustments.

2. The steering wheels should track square with the drive wheels with no toe-in or toe-out. If adjustment is necessary loosen the lock nuts at the tie rod ends and turn each tie rod in a manner so they will be the same length when the correct adjustment is obtained. Tighten tie rod lock nuts to secure this adjustment.

3. Disconnect the steering booster socket from the steering axle spider noting the relative position of the socket parts so they may be re-installed correctly

after checking wheels for correct turning geometry.

4. Check wheels for correct turning geometry by turning the wheels all the way for a left turn - this should allow the left wheel to attain an angle of 75 degrees to the frame on pneumatic tire machines and 78 degrees on solid tire machines. If an adjustment is necessary, the axle stop on the left side should be turned in or out whichever is necessary to achieve the correct angle. Repeat this procedure in a right turn with the opposite wheel and adjust the right axle stop as required.

**WARNING**

IF THE STEERING BOOSTER CYLINDER IS TO BE ACTUATED UNDER POWER DO SO ONLY WITH THE ENGINE RUNNING AT IDLE SPEED, USING EXTREME



# INDUSTRIAL TRUCK DIVISION



## LUBRICATION AND PREVENTIVE MAINTENANCE

CARE TO KEEP CLEAR OF MOVING LINKAGES TO PREVENT PERSONAL INJURY.

5. Collapse the booster cylinder until bottomed out. Extend booster cylinder from collapsed position 1/4" to 1/2". Adjust socket on end of rear drag link so that grease fitting lines up with center of spider ball. (Wheels remaining in the right turn position against axle stop). Before securing socket lock nut position the booster cylinder so that the control ball stud points out toward the truck frame at an angle of about 45 degrees to the vertical.

6. Turn wheels to straight ahead position and disconnect drag link at pitman arm.

7. Determine center position of steering gear. (Refer to Steering Gear adjustments for correct procedure).

8. With Steering Gear centered; adjust drag link socket so that the grease fitting lines up with the centerline of the pitman arm ball stud and secure with lock nut and cotter pin.

9. Back off pitman arm stop bolts and slowly turn wheel until steering knuckle contacts axle stop bolt. Turn pitman arm stop until it contacts pitman arm. Move pitman arm away from stop bolt and turn bolt one turn towards pitman arm. Lock in this position. Repeat this procedure with the remaining pitman arm stop bolt with the wheels turned in the opposite direction.

10. Turn the handwheel until wheels are in straight ahead position. Remove handwheel and replace on steering column with the center spoke aligned minus or plus 10 degrees with the center line of the machine, the center spoke pointing back.



# INDUSTRIAL TRUCK DIVISION



DEPARTMENT OF TRANSPORTATION

TO: [Illegible]

FROM: [Illegible]

[Illegible text block]

[Illegible text block]

[Illegible text block]

[Illegible text block]

[Illegible text block]

[Illegible text block]

[Illegible text block]

[Illegible text block]

[Illegible text block]

[Illegible text block]

[Illegible text block]

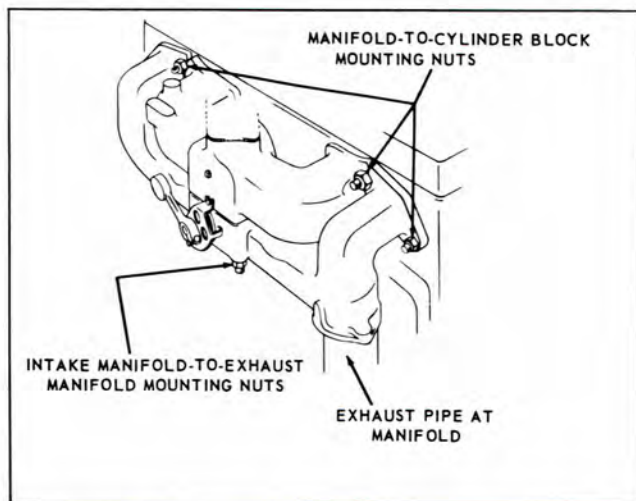
[Illegible text block]

[Illegible text block]

[Illegible text block]

[Illegible text block]

[Illegible text block]

**INTAKE AND EXHAUST MANIFOLDS**

1. Inspect gaskets for leaks and inspect security of manifold nuts.

2. Inspect exhaust pipe and muffler for damage, leakage and security of mountings.

**NUTS, BOLTS AND CAP SCREWS.** Check security of mounting, tighten as required.

Plate 6269. Intake and Exhaust Manifolds



# INDUSTRIAL TRUCK DIVISION



MANUFACTURING AND SERVICE DEPARTMENT



1. This drawing is a...  
 2. It shows the...  
 3. The...  
 4. The...  
 5. The...

Figure 1: [Illegible text]

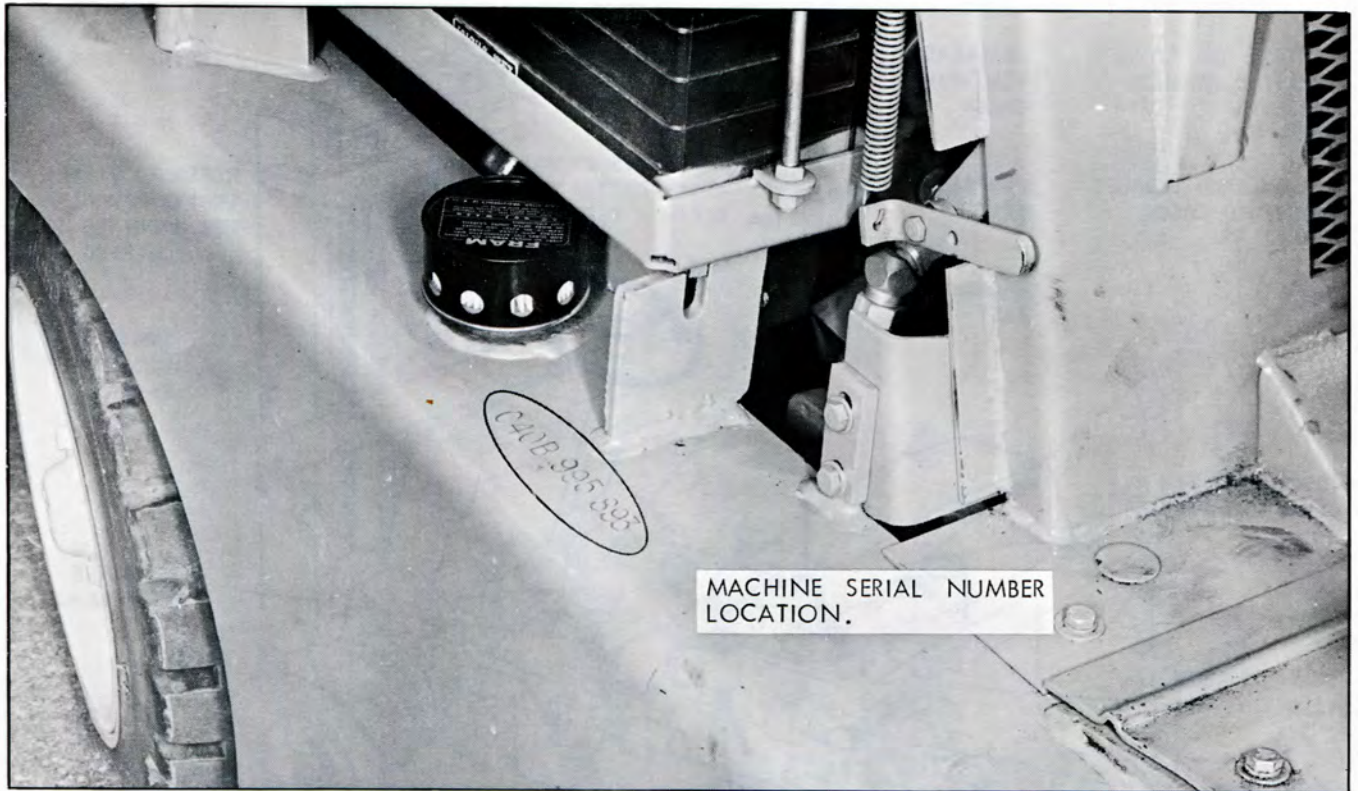


Plate 9474. Machine Serial No. Location

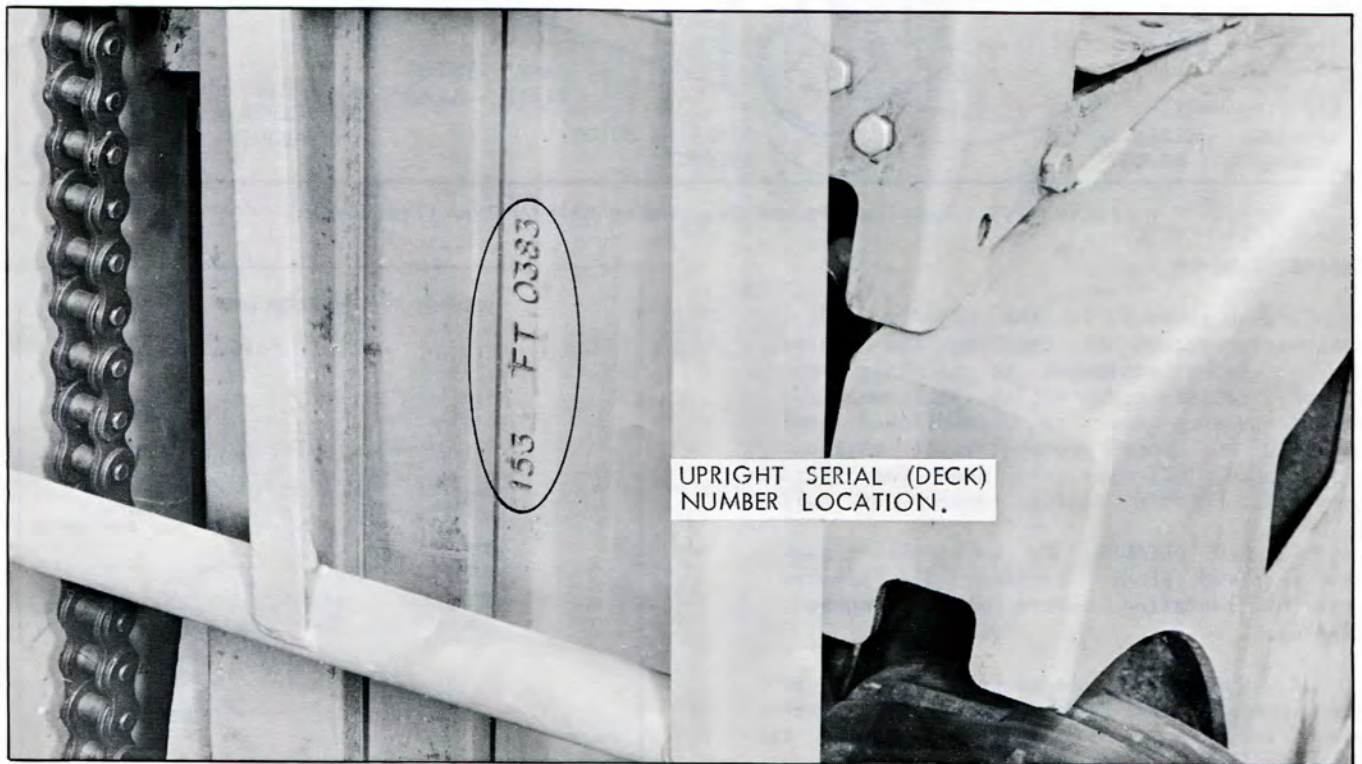


Plate 9475. Upright Serial (Deck) No. Location

LUBRICATION AND PREVENTIVE MAINTENANCE

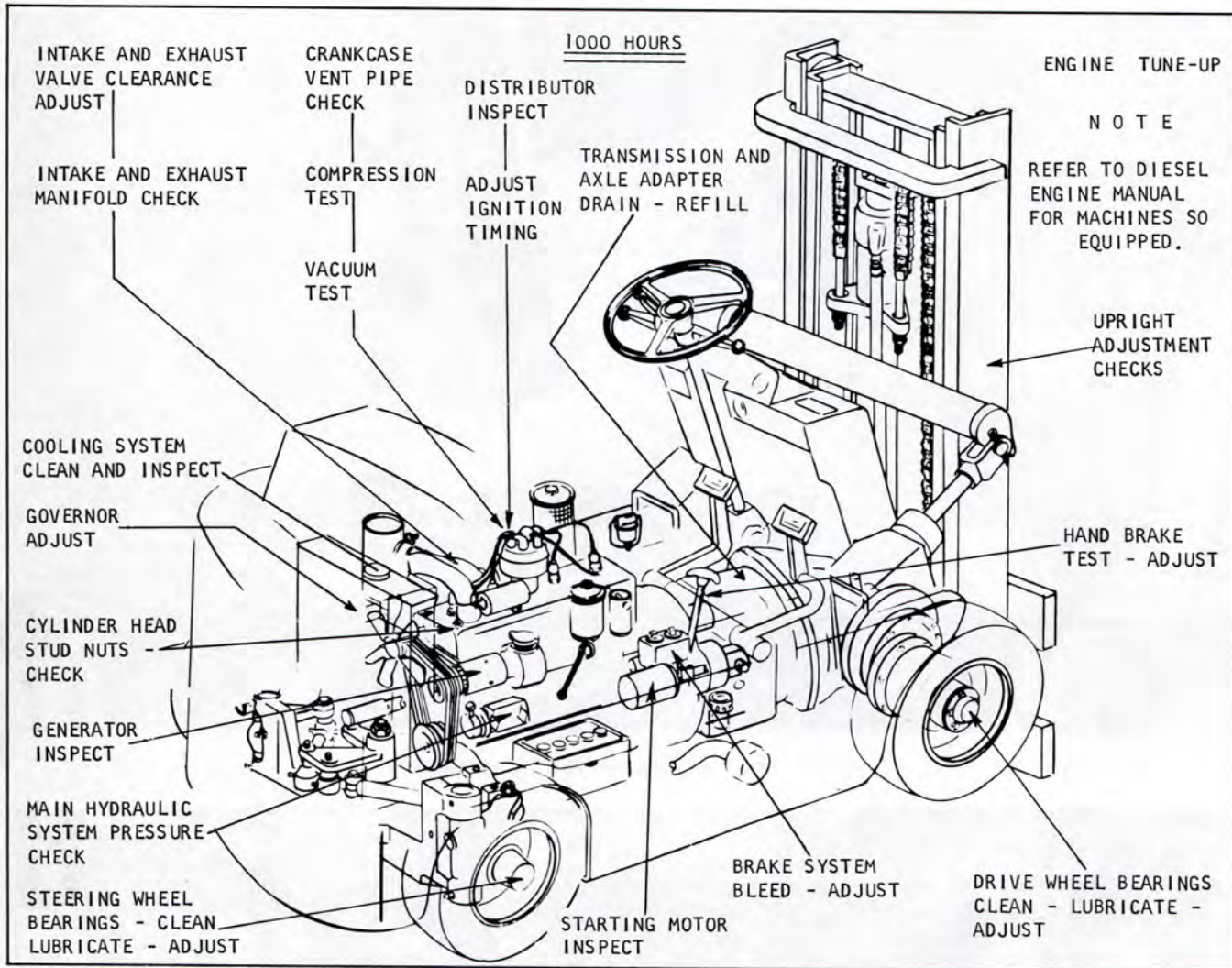


Plate 7393. Lubrication and Preventive Maintenance Illustration

**ENGINE TUNE-UP**

Engine tune-up is the orderly and systematic process of checking the engine and accessory equipment to maintain or restore satisfactory engine performance. Engine tune-up must be accomplished semi-annually and more frequently if engine performance indicates the need for these services. Perform engine tune-up as follows:

1. **AIR CLEANER.** Be sure air cleaner has received proper service. Air cleaner must be installed before making engine tune-up.
2. **FUEL PUMP.** Be sure the fuel pump bowl and strainer has been properly serviced and the fuel pump is operating satisfactorily.

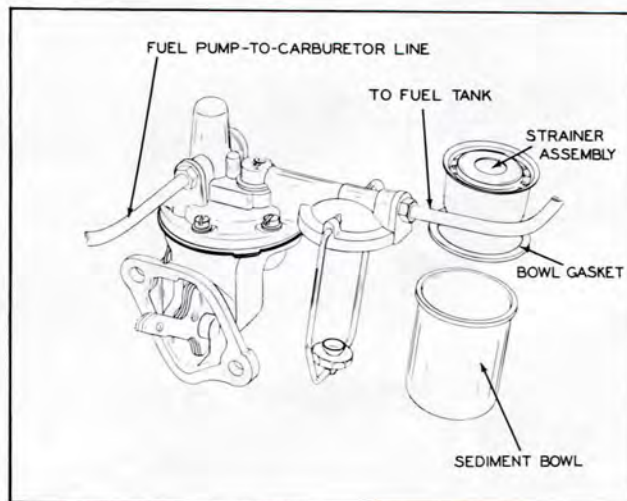


Plate 6432. Fuel Pump Strainer & Sediment Bowl



LUBRICATION AND PREVENTIVE MAINTENANCE

3. **CYLINDER HEAD STUD NUTS.** Check all stud nuts for correct torque, refer to specifications. Check cylinder head gasket for leaks.

**CAUTION**

THE SEQUENCE LISTED IN PLATE 5927 MUST BE FOLLOWED. ALL CYLINDER HEAD CAP SCREWS OR NUTS MUST BE TIGHTENED EVENLY AND TORQUED IN ACCORDANCE WITH LIMITS LISTED IN SPECIFICATIONS.

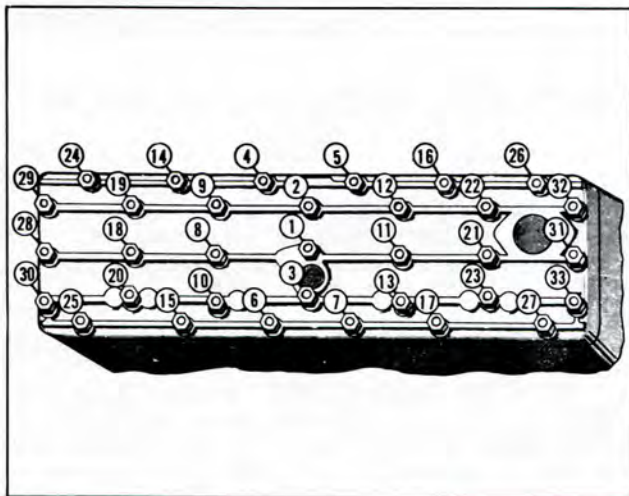


Plate 5927. Cylinder Head Stud Nut Tightening Sequence

4 **INTAKE AND EXHAUST MANIFOLDS.** Inspect for gasket leaks and security of mountings.

5. **CRANKCASE VENTILATION.** The crankcase vent pipe allows clean air to pass through the crankcase to help carry off corrosive gases (which are the by-products of combustion) that leak by the pistons and valve stems.

Check crankcase ventilation pipe for damage or obstructions. The pipe must be open to provide proper ventilation. Clean, repair, or replace as required, see Plate 6628.

6. **INTAKE AND EXHAUST VALVE CLEARANCE ADJUSTMENTS.** (PREFERRED METHOD).

- a. Remove valve chamber cover mounting screws, and the valve chamber cover gasket.
- b. With engine running at idling speed and at normal operating temperature, adjust intake valves as follows:

- c. Check for proper 0.014 inch clearance by alternately passing a 0.013 inch and a 0.015 inch flat feeler gauge between head of adjusting screw and valve stem, see Plate 3223 on following page.

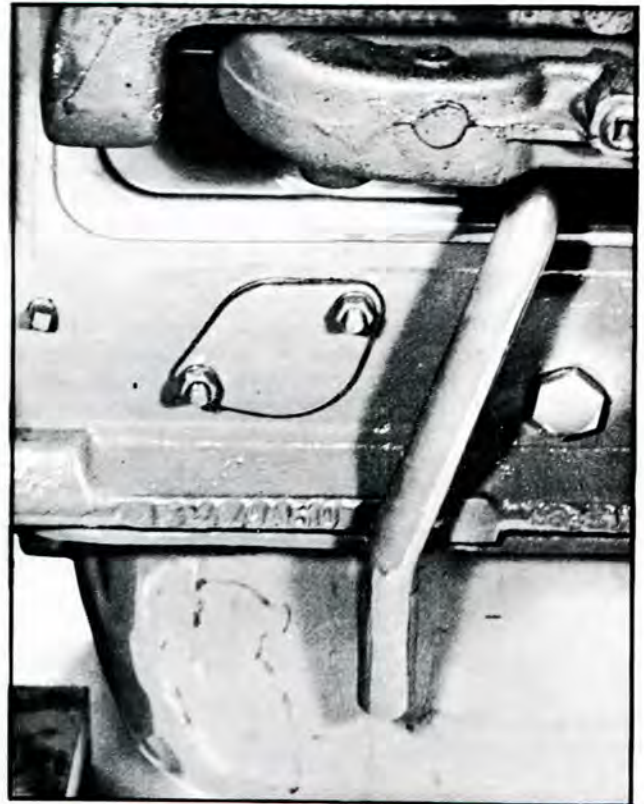


Plate 6628. Crankcase Vent Pipe

- d. If a 0.013 inch feeler gauge moves freely back and forth in gap when valve is not being lifted and a 0.015 inch feeler gauge binds, at all times, clearance requires no adjustment.

- e. If a 0.013 inch feeler gauge is gripped at all times, the clearance is insufficient.

- f. Hold valve lifter with an open end wrench while using a second wrench to turn adjusting screw 1/4 to 1/2 turn clockwise. Repeat clearance check and adjustment, until proper clearance is obtained. The adjustable type valve lifters have self-locking adjusting screws that require no lock nuts.

- g. If 0.015 inch feeler moves freely when valve is not being lifted, the clearance is too great. Hold valve lifter with an open end wrench while using a second wrench to turn valve lifter adjusting screw counterclockwise 1/4 to 1/2 turn. Repeat clearance check and adjustment until proper clearance is obtained.

h. Repeat clearance check and adjustment on remaining intake valves.

i. With engine running at slow idle and at normal operating temperature, adjust exhaust valves as follows:

j. Check for proper 0.016 inch clearance by alternately passing a 0.015 inch and a 0.017 inch flat feeler gauge between head of adjusting screw and valve stem, see Plate 3223.

k. If a 0.015 inch feeler gauge is gripped at all times, the clearance is insufficient. If a 0.017 inch feeler gauge moves freely when valve is not being listed, the clearance is too great.

m. Turn adjusting screw in the direction necessary so that a 0.015 inch feeler gauge moves freely back and forth in gap and a 0.017 inch feeler is gripped at all times.

n. After adjustment is complete on all exhaust valves, install valve chamber cover using new cover gasket and replace cover retainment screws.

**NOTE**

DO NOT REUSE OLD GASKETS. THEY DO NOT AFFORD A POSITIVE SEAL.

o. Check valve chamber cover gasket for leaks.

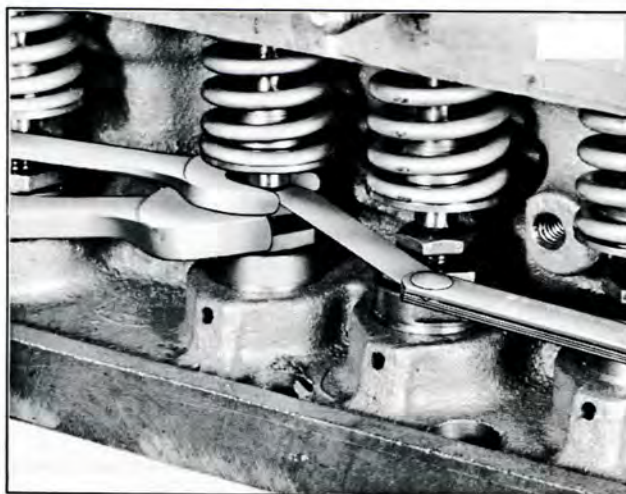


Plate 3223. Adjusting Valve Clearance

**6A. COLD SETTING. (ALTERNATE METHOD)**

To adjust valve clearance when engine is at room temperature and not running, proceed in the following manner:

a. Remove distributor cap.

b. Crank engine until distributor rotor points to No. 1 cylinder position with the breaker points open. In this position the No. 1 piston is at the top of its compression stroke with both lifters on the base circle of the cam and both valves can be adjusted.

c. Adjust the valve clearance to 0.016 inch on the intake and 0.018 inch on the exhaust. The exhaust (E) and intake (I) valve arrangement on the six cylinder engine is: E-I-I-E-E-I-I-E-E-I-I-E.

d. The other valves may be adjusted by setting the engine with the distributor rotor pointing to the rest of the cylinder positions in the sequence of the firing order which is: 1-5-3-6-2-4.

**7. COMPRESSION TEST**

a. Test battery for full charge (specific gravity 1.280 temperature of 24°C (75° F)). If battery is not fully charged, replace with fully charged battery.

b. Start engine and allow it to warm up until normal operating temperature is reached.

c. Turn off ignition.

d. Remove spark plug cables from spark plugs and remove spark plugs from cylinder head. Examine spark plugs for carbon deposits, defective insulation and general serviceability. All carbon or lead deposits must be removed from the insulation shell and electrodes. This can be done on a sand blast cleaner. Carbon deposits should be removed from the plug threads with a stiff brush. After cleaning, inspect plugs carefully for cracked or broken insulator, badly pitted electrodes or other signs of failure.

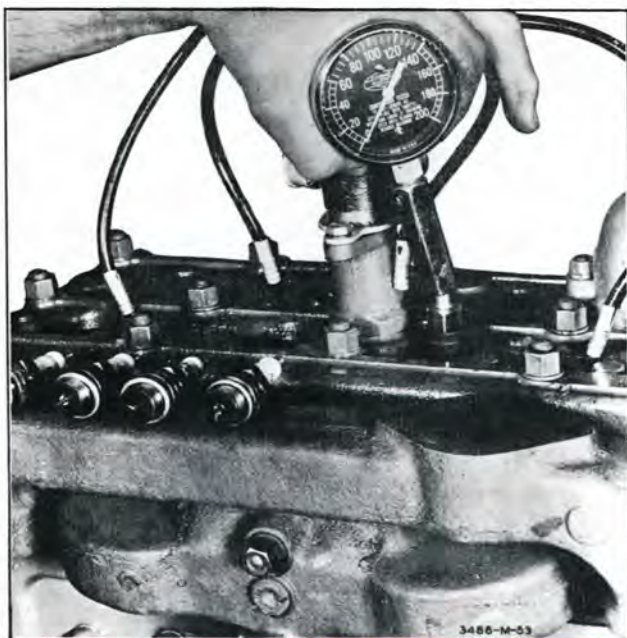


Plate 3486. Compression Test

e. With all plugs removed, install compression gauge in front spark plug port. Operate starting motor until maximum reading on gauge is obtained, see Plate 3486. Record gauge reading. Repeat this operation on each remaining cylinder.

f. If readings are reasonably high (110 to 120) pounds and the readings do not vary more than about 10 pounds between cylinders, compression may be considered normal. Excessively low readings or readings that vary more than 10 pounds between cylinders indicate internal trouble to be corrected after further examination and testing.

g. Set the spark plug gap as specified, by bending side electrode only. The gap should be checked with a wire feeler gauge rather than a flat type gauge as it is better suited for this purpose.

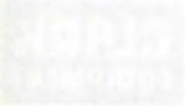
h. Spark Plug Specifications:

Standard Type	-	.025" Gap
Resistor Type	-	.035" Gap

i. Replace spark plugs using new gaskets. Always replace spark plug gasket whenever a spark plug is removed from the engine. Before installing plugs, be sure that the spark plug seat in the cylinder head is clean and free from obstructions. The spark plug should be screwed into cylinder head (using a socket of proper size) sufficiently tight to fully compress the gasket. This is most important as a large percentage of troubles due to overheated spark plugs are caused by plugs being too loose in the cylinder head. Conversely, excessive tightening may change the gap between the electrodes or crack the insulator.



Plate 3278. Check Spark Plug Gap



# FEDERAL BUREAU OF INVESTIGATION



UNITED STATES DEPARTMENT OF JUSTICE

MEMORANDUM FOR THE DIRECTOR, FBI

RE: [Illegible]

DATE: [Illegible]

TO: [Illegible]

FROM: [Illegible]

[Illegible text]

[Illegible text]

[Illegible text]

[Illegible text]

[Illegible text]



[Illegible text]

8. DISTRIBUTOR

Inspection: Remove distributor cap (without removing wires). Wipe cap with a clean cloth. Examine rotor and cap for chips, cracks, corroded terminals, carbon runners (paths which will allow high-tension leakage to ground) or if the vertical faces of the inserts are burned -- install a new cap and rotor, as this is due to the rotor being too short.

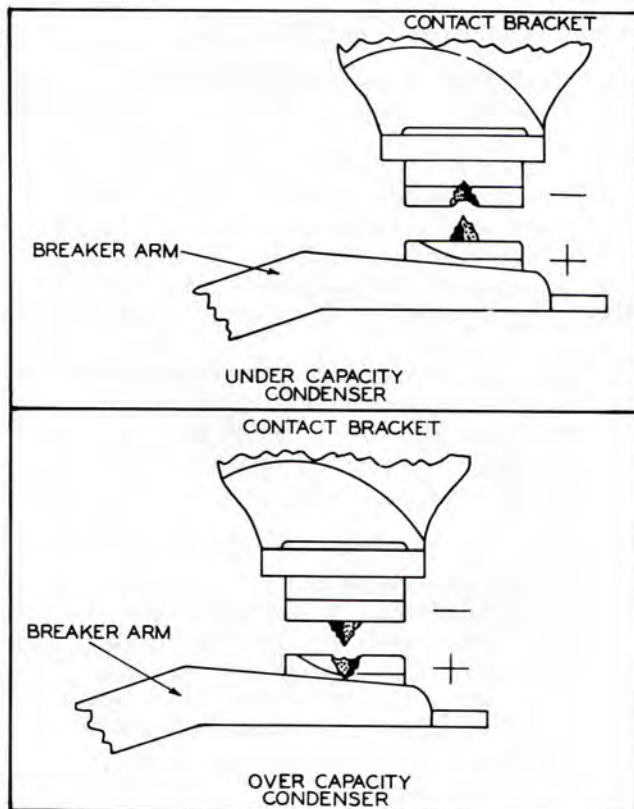


Plate 5933. Breaker Points

Check the centrifugal advance mechanism for "freeness" by turning the breaker cam in the direction of rotation and then releasing it. The advance springs should return the cam to its original position without sticking.

Inspect breaker points. If points are pitted, burned or worn to an unserviceable condition, install a new set of points.

The normal color of contact points should be a light gray. If the contact point surfaces are black, it is usually caused by oil vapor, or grease from the cam. If they are blue, the cause is usually excessive heating due to improper

alignment, high resistance or open condenser circuit.

Badly pitted points may be caused by a defective or improper condenser capacity.

If the condenser capacity is too high, the crater (depression) will form in the positive contact. If the condenser capacity is too low, the crater will form in the negative contact, see Plate 5933.

For a temporary repair, dress the contact points with a few EVEN strokes using a clean fine-cut contact file. DO NOT ATTEMPT TO REMOVE ALL ROUGHNESS OR DRESS THE POINT SURFACES DOWN SMOOTH. See Plate 7475.

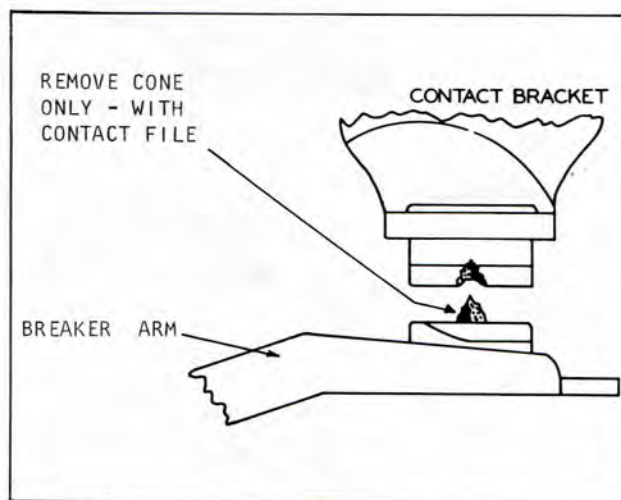


Plate 7475. File Contact Points

CAUTION

NEVER USE EMERY CLOTH OR SANDPAPER TO CLEAN POINTS AS PARTICLES WILL EMBED IN THE POINTS AND CAUSE ARCING AND RAPID BURNING.

MEASURING ENGINE SPEED

1. Connect the test leads as shown.
2. Turn switch to the LOBE position corresponding to the number of cylinders.
3. Turn the other switch to the 1000 rpm position for all idle and low speed testing. Use the 5000 rpm position for all speeds over 1000 rpm.

DISTRIBUTOR RESISTANCE TEST

1. With test leads disconnected, turn switches to DWELL and CALIBRATE positions and adjust dwell calibrator until meter reads on the SET LINE.
2. Connect test leads as shown.
3. Turn ignition switch ON with engine stopped. If distributor resistance is not excessive, meter will read in the black bar marked DISTRIBUTOR RESISTANCE.

If meter does read within black bar, readjust dwell calibrator until meter again reads on the SET LINE before making the following tests.

If meter does not read within black bar, excessive resistance is indicated. To locate excessive resistance, trace the primary circuit through the distributor with the red test lead until point of high resistance is located. Excessive resistance must be eliminated and the dwell calibrator adjusted until the meter again reads on the SET LINE before proceeding with the following tests.

DWELL AND DWELL VARIATION TESTS

1. Turn switch to the proper LOBE position.
2. Operate engine at idle speed and note reading on dwell scale of meter. Refer to specifications for proper dwell.
3. Turn tachometer switch to the 5000 rpm position and increase speed to 1500 rpm.
4. Turn switch back to the DWELL position and again note dwell reading. Slowly reduce speed to idle while watching meter. Dwell should not change more than 3 degrees in either case.

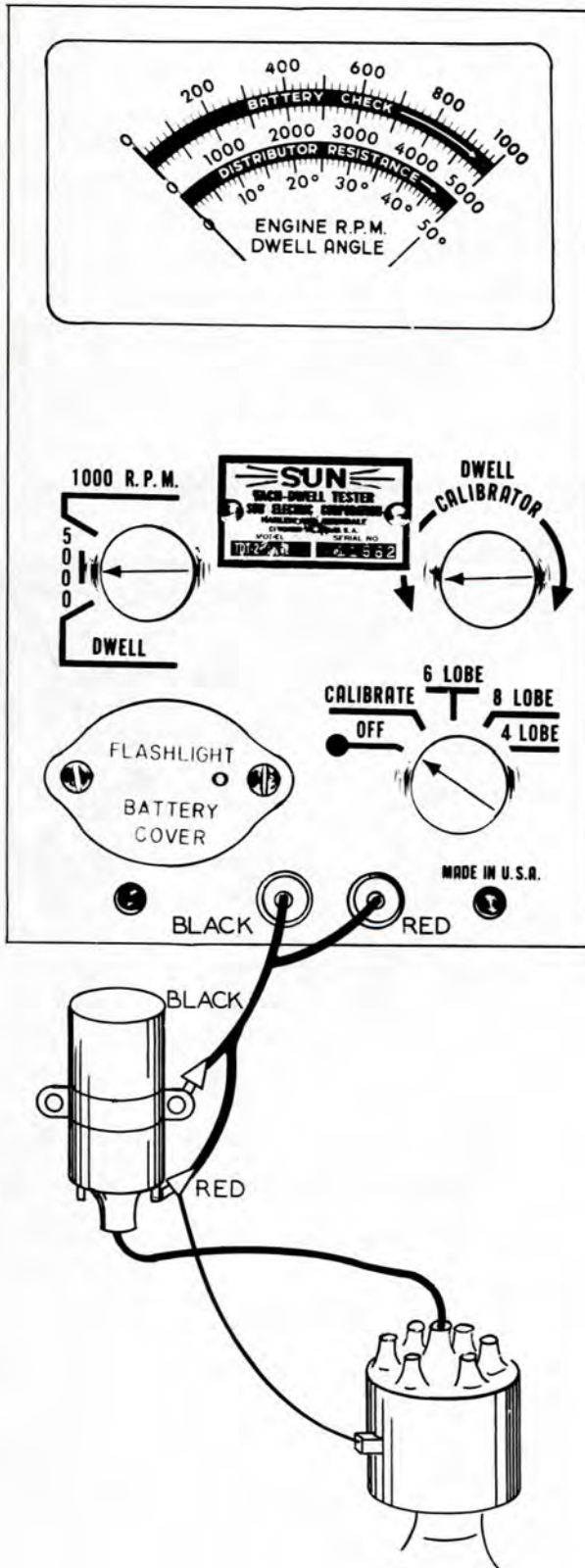


Plate 6887 Tach Dwell Meter

Contact Point Adjustment: The point opening of new points can be checked with a wire feeler gauge, but the use of a feeler gauge on older, rough points is not recommended, since accurate gauging cannot be done on such points. The gauge measures between high spots on the points instead of the true point opening. Point opening of used points can be checked with a Dwell Angle Meter. A meter of this type indicates the cam or contact angle. This angle is the number of degrees that the breaker cam rotates from the time the points close until they open again. The cam angle increases as the point opening decreases and it is reduced as the point opening is increased. Manufacturers of this type equipment furnish complete instructions as to their use.

**NOTE**

REFER TO SPECIFICATIONS FOR DWELL ANGLE AND CONTACT POINT OPENING.

To check point opening with a feeler gauge, insert a wire feeler gauge of proper size between the contact points. MAKE CERTAIN THAT THE BUMPER BLOCK ON THE MOVABLE CONTACT IS AT THE HIGH POINT ON THE CAM. If adjustment is necessary, loosen the lock screw, and insert a screwdriver of the proper size in the adjustment slot and move the stationary arm until the correct clearance is obtained. Tighten locking screw and recheck point gap. See Plate 7457.

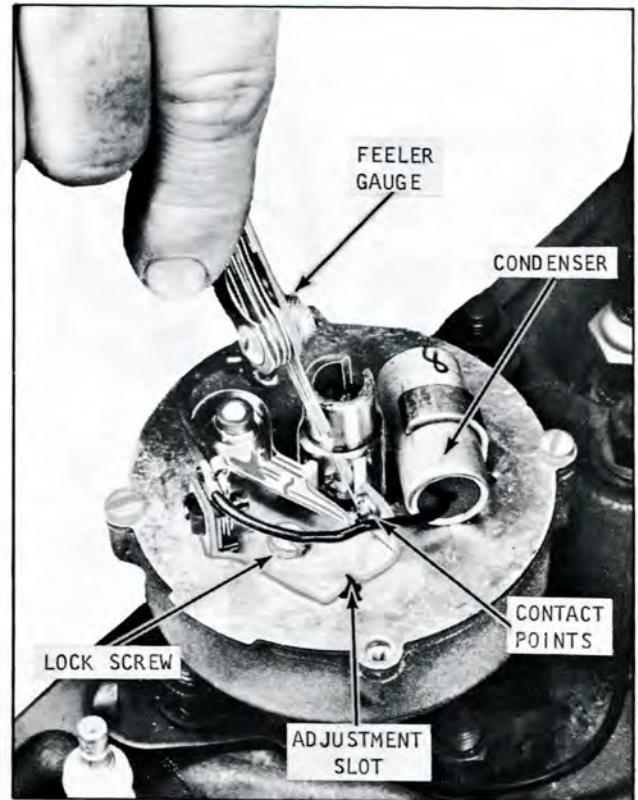


Plate 7457. Contact Point Adjustment

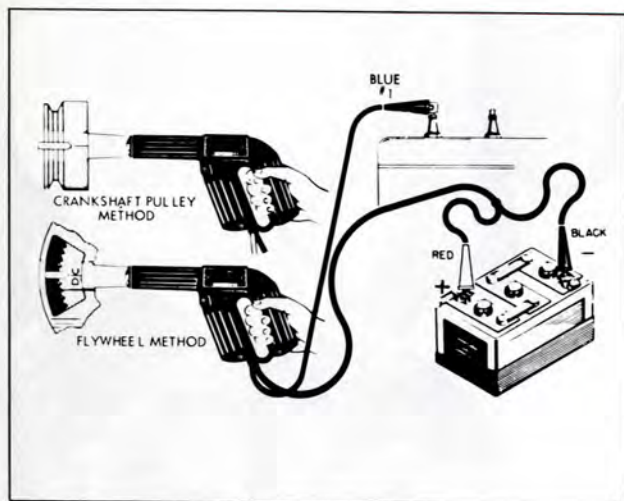


Plate 7818. Timing Light Hookup

9. IGNITION TIMING

There are two methods of checking ignition timing --- with or without a timing light. The **PREFERRED METHOD** is to use a timing light in following sequence:

Paint a line on the flywheel (or in some cases, on the front pulley) so the correct timing mark will be more legible under the timing light.

- a. Clip blue secondary lead of light to the #1 spark plug -- leave spark plug wire on plug.
- b. Connect primary positive lead (red) to positive terminal of battery.
- c. Connect primary negative lead (black) to negative battery terminal.
- d. Start engine and run a 400 RPM or below so the automatic advance of the distributor is completely retarded. **THIS IS VERY IMPORTANT TO OBTAIN CORRECT TIMING.**

**N O T E**

The initial advance RPM range is 430-580. Distributor advance at 600 engine RPM should be 1° to 5°.

- e. Direct timing light on the pulley (or flywheel through opening in bell housing) and note timing marks as light flashes. The light should flash on the timing mark that is listed in specifications.
- f. To advance timing, turn distributor body clockwise. To retard timing, turn distributor body counterclockwise.

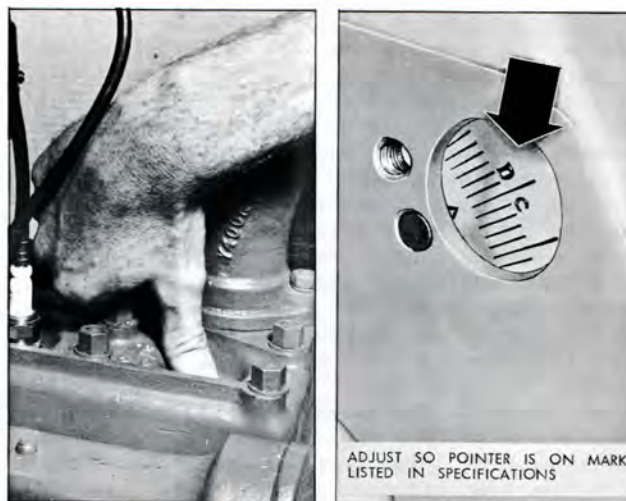


Plate 7861. Ignition Timing

g. When timing is correct, tighten distributor clamp screw securely. Then recheck timing again with light.

**ALTERNATE TIMING METHOD**

- a. Remove #1 Spark Plug -- put your thumb over the spark plug hole and crank engine by hand until air is exhausting.
- b. Continue to slowly crank engine until the mark listed in specifications lines up with the pointer in bell housing.
- c. Loosen the distributor clamp bolt and rotate the distributor body until the contact points just start to open. (This may be more accurately checked by means of a test lamp connected between the distributor primary lead and the negative terminal of the battery -- when the points are closed the light will be ON and as soon as the points break the light will go OFF.)
- d. Tighten distributor mounting bolts.



10. VACUUM TEST

Before making vacuum test, make certain cylinder head is securely tightened and that cylinder head gasket is not leaking. Air cleaner must be installed and must be clean to perform vacuum test. Manifold stud nuts must be tight and there must not be any leakage at gasket.



Plate 6643. Vacuum Test

(a) Remove plug at intake manifold and install vacuum gauge, see Plate 6443. Using the tachometer, set the engine idle speed at 450 to 500 RPM.

**Idle Speed Adjustment:** A stop screw controls action of the throttle valve. Turn screw clockwise for faster idle speed, or counterclockwise for slower idle speed. This adjustment should be made with a tachometer. Idling speed should be set for 450 to 500 revolutions per minute. Reset idle mixture screw if necessary, after throttle adjustment has been made, see Plate 6889.

(b) Check the vacuum gauge. A steady reading from 18" to 22" of mercury is a normal reading, indicating that valve and spark timing, valve seating, and piston ring sealing are all satisfactory.

(c) A steady but below normal reading indicates a condition common to all cylinders such as a leak at the carburetor gasket, late ignition or valve timing, or uniform piston ring and bore wear.

(d) A slowly fluctuating or drifting reading indicates that the fuel idle mixture is incorrect. Look for the cause in the fuel system.



Plate 6889. Idle Speed Adjustment

(e) A rhythmic pulsating reading is caused by a condition affecting one or more cylinders, but not all, and indicates leaky valve, gasket blow-by, restricted intake port, or an electrical miss.

(f) An intermittent pulsating reading is caused by an occasional malfunction, such as a sticking valve (all valves may be erratic in operation if the valve springs are weak), electrical miss caused by insufficient distributor point tension or low coil voltage coupled with inconsistent spark plug gaps or fouled plugs, or dirt in the fuel system finding its way into passages of critical size or valve seats in the carburetor.

(g) A normal reading that quickly falls off (with engine running at approx. 1860 RPM) indicates exhaust back pressure caused by a restriction in the exhaust system.

(h) Make indicated corrections to bring vacuum to 18" to 22" of mercury normal reading.

**Idle Fuel Adjustment:** The carburetor is controlled by the idle adjustment screw that regulates the fuel-air mixture, see Plate 6889. Turning the screw clockwise, towards the seat, cuts off air increasing the suction on the idle jet and making the mixture richer. Turning the idle adjusting screw counterclockwise, or away from seat, allows more air to be mixed with the fuel making a leaner mixture for idling.

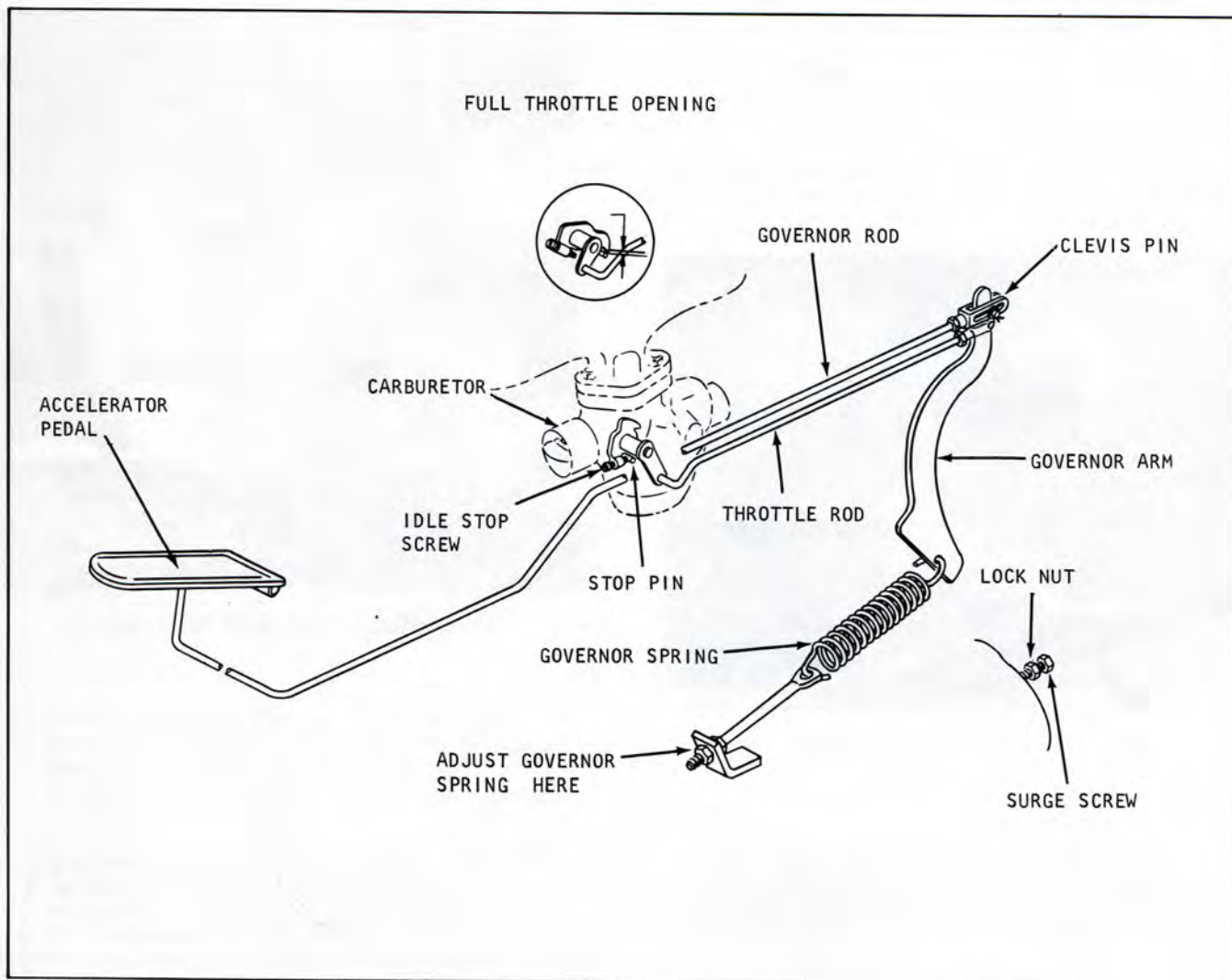


Plate 10443. Governor Adjustment

11. GOVERNOR ADJUSTMENT

With timing set on top dead center, and the carburetor properly adjusted to idle at 500 R.P.M., proceed with the following:

A. Loosen Governor Surge Screw Jam Nut and back Surge Screw out.

B. Disconnect Governor Rod from Governor Arm by removing Clevis Pin.

**N O T E**

REMOVE CLEVIS PIN --- DO NOT LOOSEN CL VIS JAM NUT.

C. With the Governor Rod disconnected, the Governor Arm will move forward. Check the Carburetor Throttle Opening. There should be 2/32 inch clearance between the Full Throttle Opening Stop and Stop Pin on the Carburetor.

If adjustment is necessary, adjust the Throttle Rod between carburetor and governor arm until the specified clearance (3/32 inch between STOP and STOP PIN) is obtained.

D. Push the Governor Arm toward rear of machine until the Idle Stop Screw contacts Stop Pin on the carburetor. Rotate the Governor Surge Screw inwards until screw comes in contact with the Governor Shaft Lever (when holding the governor arm rearward) ----- DO NOT ROTATE SCREW SO FAR THAT THE IDLE STOP SCREW MOVES AWAY FROM STOP PIN. When correct surge screw adjustment is obtained, tighten jam nut.



# INDUSTRIAL TRUCK DIVISION



LUBRICATION AND PREVENTIVE MAINTENANCE

E. With the use of an Electric Tachometer, start engine (Warm up to normal temperature) and check for NO -- LOAD 2350 R.P.M.

## N O T E

GOVERNED R.P.M. SHOULD BE CHECKED WITH THE GOVERNOR ROD DISCONNECTED BETWEEN THE ACCELERATOR LINKAGE AND THE GOVERNOR ARM.

If adjustment is necessary, adjust the Governor Spring, See Plate 10443.

F. Attach Rod Clevis to Governor Arm with Clevis Pin.

## I M P O R T A N T

WITH IGNITION OFF, DEPRESS ACCELERATOR PEDAL AND CHECK THROTTLE OPENING. IF THERE IS MORE THAN 3/32 INCH CLEARANCE BETWEEN THE FULL THROTTLE OPENING STOP AND STOP PIN (ON THE CARBURETOR), ADJUST THE GOVERNOR ROD CLEVIS, OR ACCELERATOR PEDAL LINKAGE TO OBTAIN THIS DIMENSION.

G. Start engine and again check for NO - LOAD 2350 R.P.M.

If specified R.P.M. is not obtained, check for binding linkage, etc., free up, straighten or repair as required.



Faint text or a line of information, possibly a date or reference number, located below the header.

Main body of faint, illegible text, likely the primary content of the document, spanning the middle and lower sections.

**STARTING MOTOR**

1. Remove end plate (or Brush Cover) from starter. Use a wire hook to lift a brush spring and remove brush from holder. Compare brush size with that of a new brush. If brush is worn beyond half the original size, or if brushes are jammed, chipped, or broken they must be replaced.

**CAUTION**

NEVER ALLOW SPRING TO SNAP DOWN ON BRUSHES.

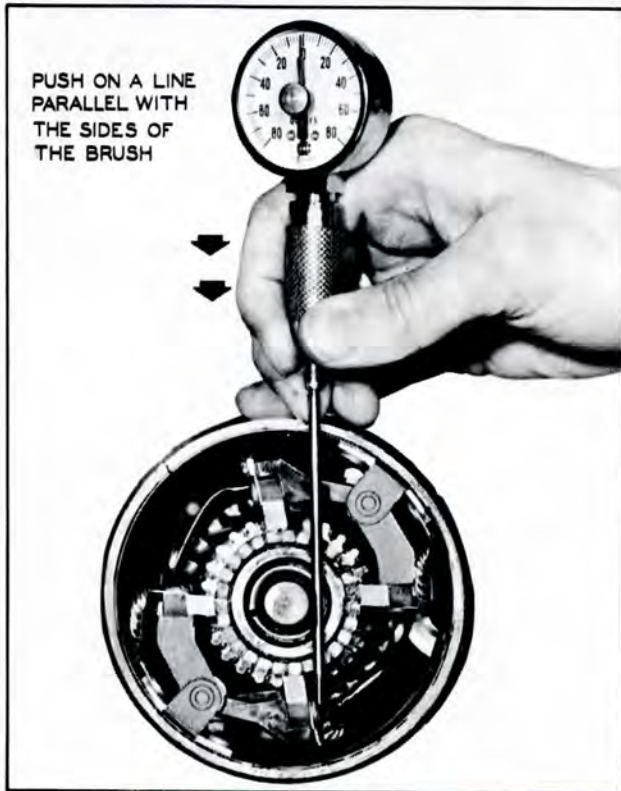


Plate 6449 Checking Brush Spring Tension

2. Check for Brush Spring Tension, refer to Specifications. Refer to the following procedures for checking spring tension.

Measuring Brush Spring Tension - Reaction Type Brushes. Hook the scale under the brush spring near the end and push or pull on a line parallel to the sides of the brush. To assist in telling the exact instant that the pressure is relieved, a small strip of paper can be placed under the brush. Pull slightly on the paper and the paper will slip out at the correct instant for reading the spring scale.

Measuring Spring Tension - Swinging Type Brushes: Hook the spring scale under the brush screw tight

against the brush and push or pull on a line parallel to the sides of the brush. Take the reading just as the brush leaves the commutator. Pulling slightly on a strip of paper which has been placed under the brush will indicate when the brush leaves the commutator and the correct instant for reading the spring scale.

3. If commutator is glazed or dirty, clean with a strip of No. 00 sandpaper. Blow out all dirt and grit with compressed air.

**CAUTION**

DO NOT USE EMERY CLOTH TO CLEAN COMMUTATOR.

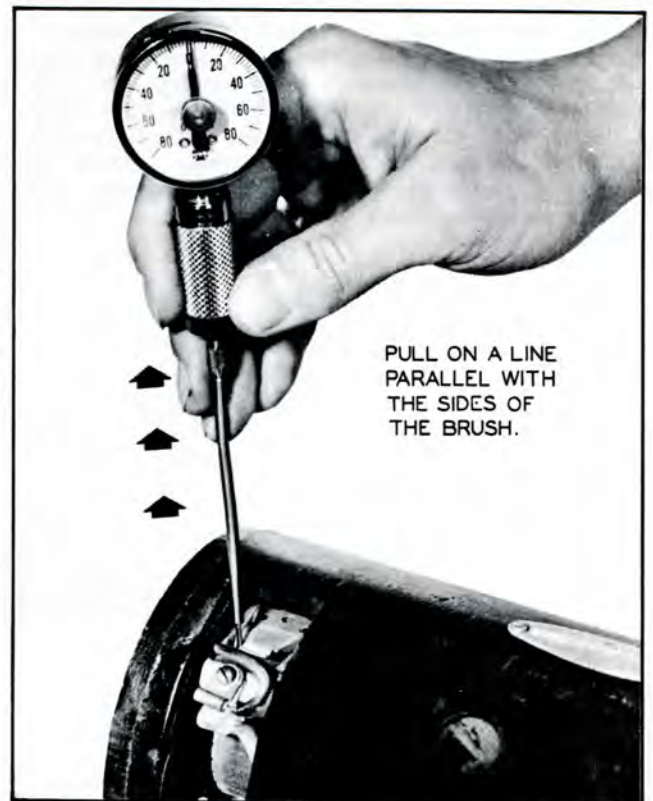


Plate 6450. Checking Brush Spring Tension

Condition Test: Use one of the two following methods to determine whether the starting motor should be removed from the engine for inspection, service or replacement.

1. First Method: Operate the starting motor by disconnecting the battery cable from the solenoid switch and holding the cable terminal firmly against the starting motor terminal, using a battery known to be fully charged and in good condition. To do this it will be necessary to remove the solenoid switch.

2. If the motor reacts correctly, and the drive mechanism engages and disengages each time the starting motor is operated, the starting motor is in good condition.

3. If motor does not react properly, it must be removed for inspection or replacement.

4. Second Method: Using a voltmeter and a battery (fully charged) that is in good condition, connect positive lead of test voltmeter to positive terminal of battery and negative lead of voltmeter to negative (grounded) terminal of battery. Record voltmeter reading. Now pull high-tension wire from ignition coil so engine will not start when starter is engaged. Connect positive lead of test voltmeter to ground and negative lead of test voltmeter to starter switch terminal. Turn ignition switch to start position and note voltmeter reading. Compare this reading with the previously recorded reading. If the voltage drop is more than 4 volts, or if the second reading is below 8 volts, the starting motor should be removed from the engine for further testing and repair, or replacement.

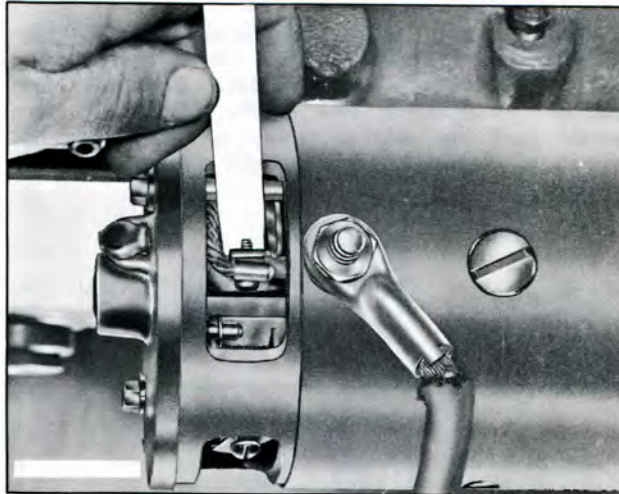


Plate 3436. Seating Brushes

**NOTE**

**BLOW OUT ABRASIVE PARTICLES AFTER SEATING BRUSHES.**

**GENERATOR**

1. Remove end plate (or Brush Cover) from generator. Use a wire hook to lift a brush spring and remove brush from holder. Compare brush size with that of a new brush. If brush is worn beyond half the original size, or if brushes are jammed, chipped, or broken they must be replaced.

**CAUTION**

**NEVER ALLOW SPRING TO SNAP DOWN ON BRUSHES.**

New brushes can be seated with a brush seating stone. When held against the revolving commutator, the abrasive material carries under the brushes, seating them in a few seconds. Blow out abrasive particles after seating brushes. See Plate 3436.

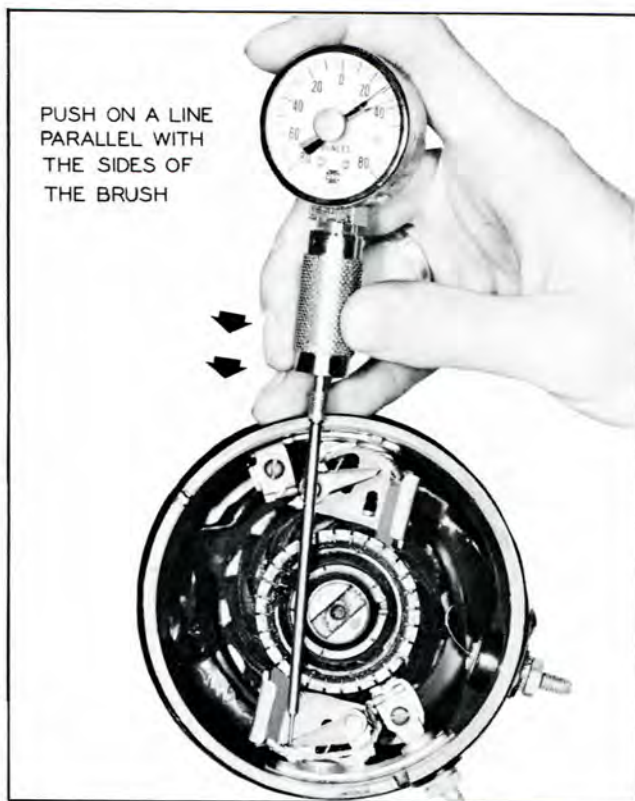


Plate 6451. Checking Brush Spring Tension

Using a spring scale, check for proper brush spring tension. Refer to Specifications. Refer to the following procedures for checking spring tension.

Measuring Brush Spring Tension - Reaction Type Brushes. Hook the scale under the brush spring near the end and push or pull on a line par-

allel to the sides of the brush. To assist in telling the exact instant that the pressure is relieved, a small strip of paper can be placed under the brush. Pull slightly on the paper and the paper will slip out at the correct instant for reading the spring scale.

Measuring Spring Tension - Swinging Type Brushes: Hook the spring scale under the brush screw tight against the brush and push or pull on a line parallel to the sides of the brush. Take the reading just as the brush leaves the commutator. Pulling slightly on a strip of paper which has been placed under the brush will indicate when the brush leaves the commutator and the correct instant for reading the spring scale.

3. If commutator is glazed or dirty, clean with a strip of No. 00 sandpaper. Blow out all dirt and grit with compressed air.

**CAUTION**

**DO NOT USE EMERY CLOTH TO CLEAN COMMUTATOR.**

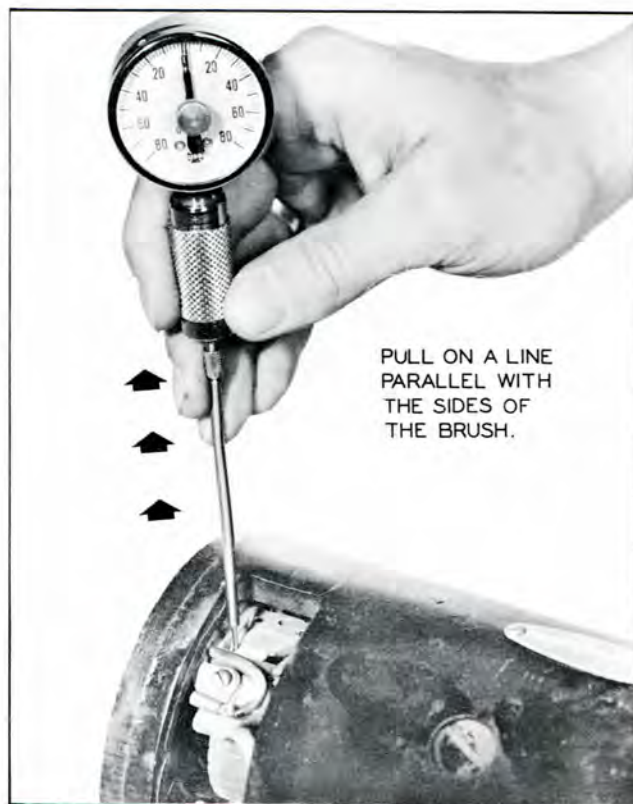


Plate 6450. Checking Brush Spring Tension

## NOTE

BLOW OUT ABRASIVE PARTICLES AFTER SEATING BRUSHES.

## REGULATOR

Inspect regulator leads for frayed or worn condition. Check to make certain that leads are tight and securely mounted.

## WIRING

Check all wires for loose or corroded connections and for fraying. Replace defective wires.

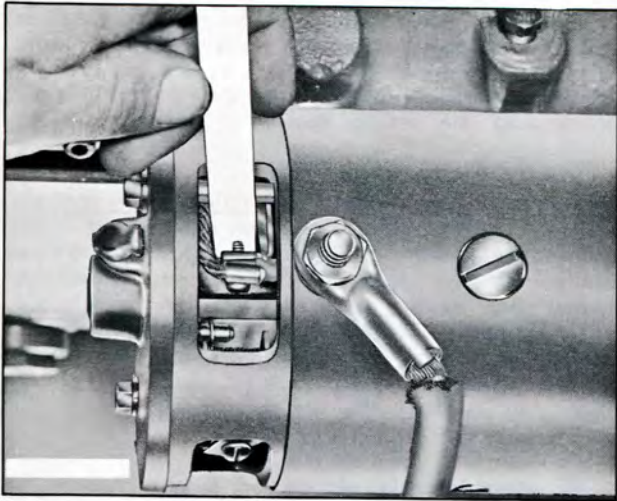
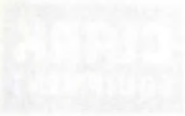


Plate 3436. Seating Brushes







# INDUSTRIAL TRUCK DIVISION



Product Literature



Model 1000 - 10,000 lbs. capacity

Model 1500 - 15,000 lbs. capacity

## Model 1000 - 10,000 lbs. capacity

## Model 1500 - 15,000 lbs. capacity

The Model 1000 is a compact, maneuverable truck designed for tight quarters. It features a low profile and a wide wheelbase for stability. The truck is equipped with a powerful engine and a transmission that allows for easy operation. Its design makes it ideal for use in warehouses, distribution centers, and other industrial environments.

The Model 1500 is a more robust truck designed for heavy-duty work. It has a larger capacity and a more powerful engine than the Model 1000. It is also equipped with a transmission and other features that make it easy to operate. This truck is well-suited for use in large industrial facilities and outdoor environments.

The Model 1000 is available in several configurations to meet your specific needs. You can choose from different engine options, transmission types, and wheel configurations. This flexibility allows you to select the truck that is best suited for your application. Contact us today to learn more about the features and benefits of the Model 1000.

The Model 1500 is also available in several configurations to meet your specific needs. You can choose from different engine options, transmission types, and wheel configurations. This flexibility allows you to select the truck that is best suited for your application. Contact us today to learn more about the features and benefits of the Model 1500.

## Model 1500 - 15,000 lbs. capacity

## Model 2000 - 20,000 lbs. capacity

The Model 1500 is a compact, maneuverable truck designed for tight quarters. It features a low profile and a wide wheelbase for stability. The truck is equipped with a powerful engine and a transmission that allows for easy operation. Its design makes it ideal for use in warehouses, distribution centers, and other industrial environments.

The Model 2000 is a more robust truck designed for heavy-duty work. It has a larger capacity and a more powerful engine than the Model 1500. It is also equipped with a transmission and other features that make it easy to operate. This truck is well-suited for use in large industrial facilities and outdoor environments.

Contact us today to learn more about the features and benefits of the Model 1500.

Contact us today to learn more about the features and benefits of the Model 2000.

CLEAN AND REPACK AXLE ENDS

Every 1000 operating hours remove and repack the axle ends.

1. Tilt upright back. Place solid heavy blocks under each upright rail. Tilt upright forward until vertical to the floor. This should allow the drive wheels to clear the floor. Remove drive wheels.

**WARNING**

ON PNEUMATIC TIRE MACHINES DEFLATE TIRES BEFORE REMOVING WHEELS.

2. Remove hub cap, outer spindle nut, lockwasher, inner spindle nut and washer. Pull hub assembly from spindle.

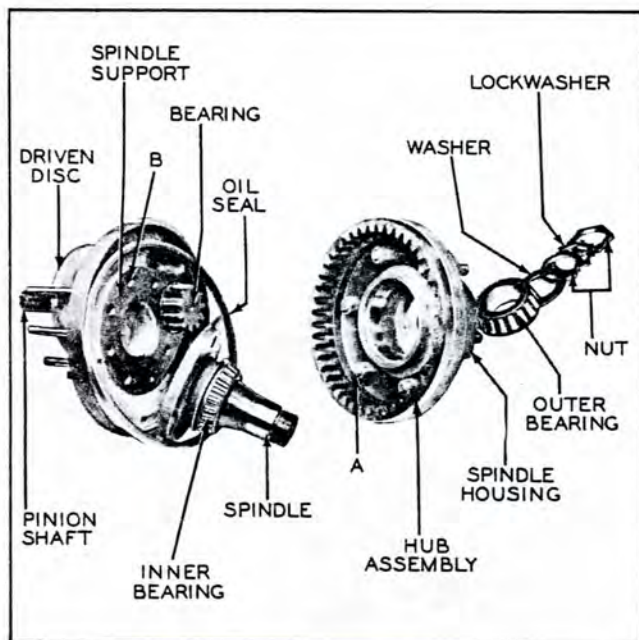


Plate 5694. Axle End Assembly

3. Remove bearings and clean in a Stoddard type cleaning solvent. Slop bearings up and down in solvent. Remove and tap large side of bearing against a block of wood to dislodge solidified particles of lubricant. Repeat operation until bearings are thoroughly clean. Blow bearings dry with compressed air. Direct air stream across bearing to avoid spinning. Slowly rotate bearing by hand to facilitate drying. Dip bearings in gear oil and wrap in paper until they are to be reinstalled.

4. Pack all bearings with NLGI #1 (Amolith grease EP #1 or its equivalent) before final assembly. Also pack the hub cavity between the

bearings 1/2 full. (As an alternate grease No. 1 E.P. lithium soap grease may be used).

5. Clean ring gear, pinion drive shaft, hub assembly, spindle and spindle support.

6. Inspect seals for cuts, scratches and nicks. It is necessary to replace seal if such a condition is found. Check the axle end vent for obstruction, vent must be open. See Plate 6893.

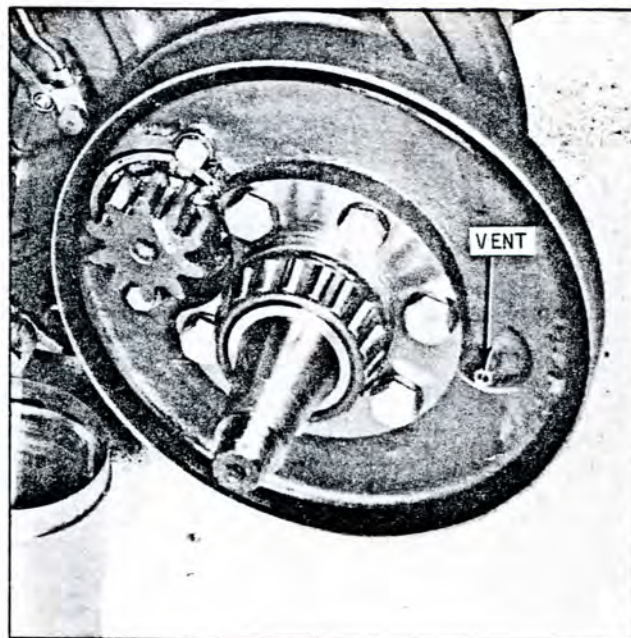


Plate 6893. Typical Axle End Vent

7. Pack the spaces between the teeth of the ring gear and pinion, level full for the entire circumference with NLGI #1 (Amolith grease EP #1 or its equivalent). The approximate amount of grease in this area is to be 1 1/4 pounds.

8. Install bearings, seal and hub assembly on spindle. Tighten inner bearing adjusting nut until bearings bind slightly during rotation. Back off adjusting nut approximately 1/8 turn and lock with outer nut. Secure this adjustment by bending the tangs on the lock washer. Install the hub cap.

9. Replace drive wheels and tires. Inflate tires if they are of the pneumatic type. Tilt upright back and remove blocking.

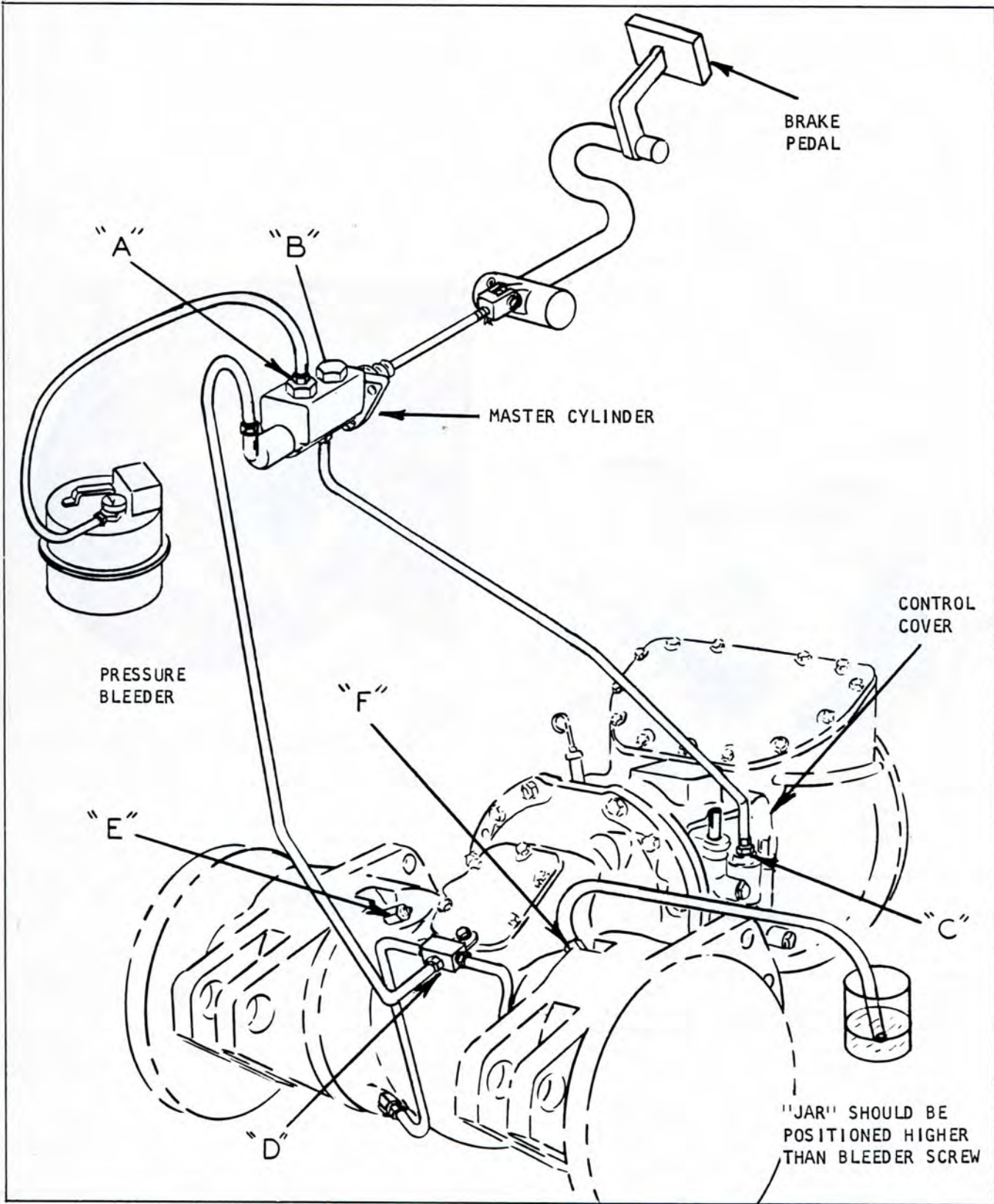


Plate 7302. Bleeding Brakes



# INDUSTRIAL TRUCK DIVISION



LUBRICATION AND PREVENTIVE MAINTENANCE

## BRAKE BLEEDING PROCEDURE

Proper operation of the hydraulic brake system requires a solid column of fluid without air bubbles at all points in the pressure system. Under certain conditions it becomes necessary to bleed fluid from the system in order to expel air bubbles which have become mixed with the fluid. The necessity of bleeding is indicated by a soft or spongy pedal, or at any time a brake line is removed (or broken) the system must be bled.

Step 1. Tilt upright back. Place solid heavy blocks under each upright rail. Tilt upright forward until vertical to the floor. This should allow the drive wheels to clear the floor.

### NOTE

IF DRIVE WHEELS ARE REMOVED FROM MACHINES EQUIPPED WITH PNEUMATIC TIRES, DEFLATE TIRES BEFORE REMOVING.

Step 2. Check the brake pedal free travel (see specifications). Clean dirt from around the filler cap of the master cylinder reservoir. Brake fluid should be within 1/4" of the top. With filler cap off the master cylinder, depress and release brake pedal. A small displacement of fluid should be noticed in the cylinder reservoir. If this happens, the brake pedal (upon being released) is returning the master cylinder piston to its normal position to open a master cylinder port. This port must be open. If fluid does not return to the reservoir (when releasing brake pedal), this indicates improper pedal free travel and a pedal adjustment is required.

### NOTE

THE KEY LETTERS IN PARENTHESES ARE SHOWN ON OPPOSITE PAGE EXCEPT WHERE OTHERWISE INDICATED.

Step 3. To properly bleed the system it is recommended that a pressure bleeder filled with about two quarts of S.A.E. 70-R-3 heavy duty brake fluid be connected to the master cylinder reservoir. Pressure bleeder should then be pressurized to 10-20 P.S.I.

Step 4. Remove vented filler plug and attach pressure bleeder.

Step 5. Loosen plug (B) to permit air to escape from reservoir. Tighten plug after fluid appears around plug.

Step 6. Loosen tube nut (C) and allow all air to escape. Tighten tube nut.

Step 7. Loosen tube nut (D) and allow air to escape. Tighten tube nut.

Step 8. Install a bleeder hose on bleeder screw (E) and submerge the unattached end of the hose in a clean transparent jar containing several inches of brake fluid. NOTE: DURING BLEEDING THE JAR SHOULD BE ELEVATED TO A POSITION HIGHER THAN THE BLEEDER SCREWS MAKING SURE THAT THE END OF THE HOSE REMAINS SUBMERGED IN THE FLUID AT ALL TIMES. Allow fluid to flow until all traces of air are gone. Tighten bleeder screw. Repeat this operation on opposite bleeder screw (F).

Step 9. After all bleeding has been completed close the pressure bleeder shut-off cock and loosen hose connection at master cylinder to allow pressure to escape. Replace master cylinder cap.

Step 10. If wheels were removed replace them. (Inflate tires if they are of the pneumatic type). Tilt upright back and remove blocking from under each upright rail.

If a pressure bleeder is unavailable the system may be bled manually by following steps six thru eight. It must be remembered that the brake pedal should be depressed slowly and held to the floor-board until the line connections or bleeder screws are securely tightened. This prevents the possibility of air being drawn into the system during the bleeding operation. Check master cylinder reservoir level periodically during manual bleeding and fill to within 1/4 inch of the top as required.

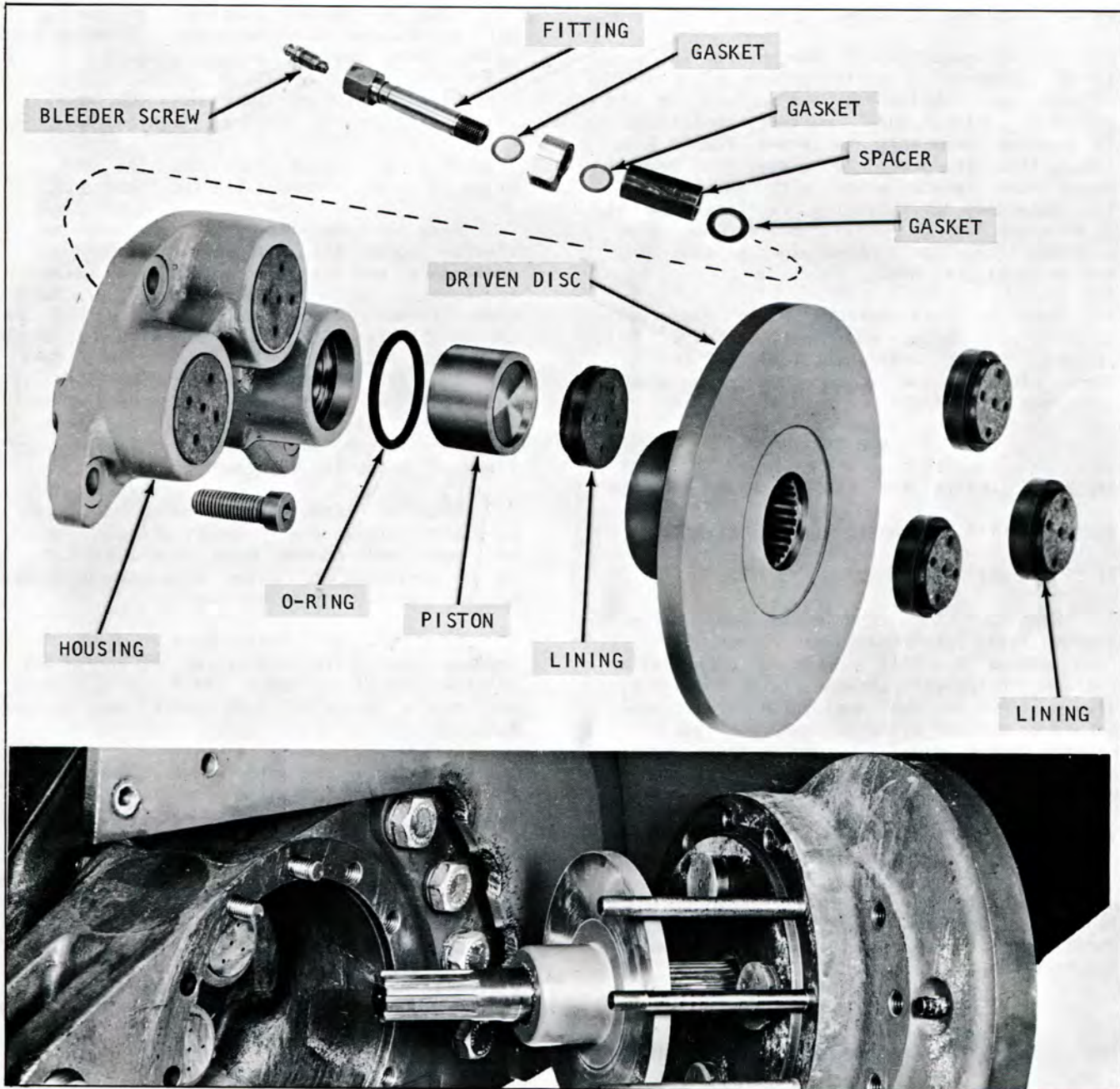


Plate 7567. Typical Service Wheel Brake Assembly

**DESCRIPTION**

When depressing the brake pedal hydraulic pressure is applied to the brakes, the pistons move out clamping the rotating disc between the pistons and anvil linings producing the braking action. When hydraulic brake pressure is released the clamping action is removed and the disc is again free to rotate.

If it is found that the brake effectiveness has gradually dropped to a noticeable degree (and the system has been properly bled and pedal free travel is adjusted correctly) the linings are worn beyond their designed limits. If lining wear has reached this point, the replacement of linings is necessary. Report to designated person in authority.

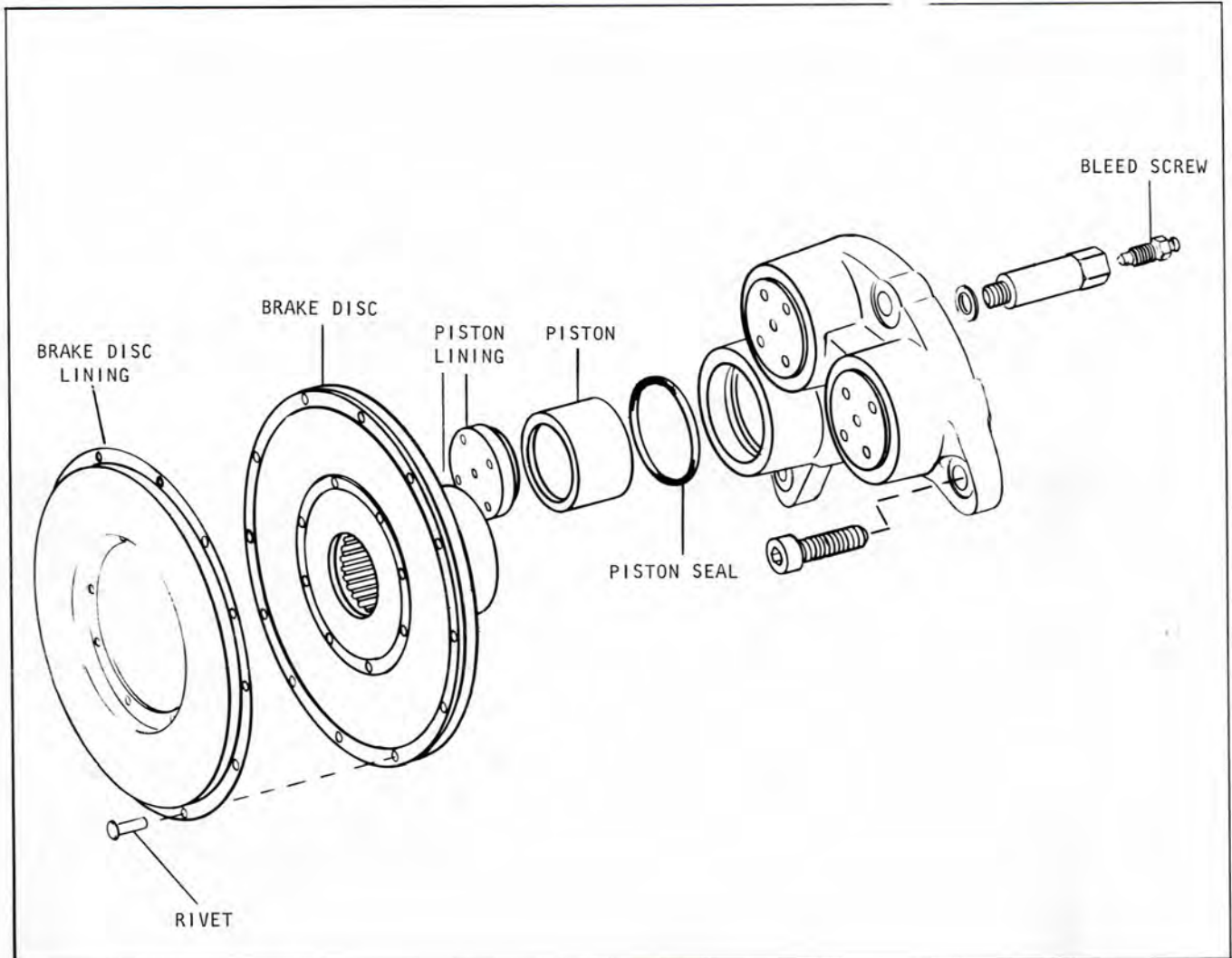


Plate 8261. Typical Wheel Brake Assembly

**DESCRIPTION**

When depressing the brake pedal, hydraulic pressure is applied to the brakes, the pistons move out and their linings force the brake disc and its lining against a member of the axle end producing braking action by friction.

**INSPECTION**

Operating conditions determine the inspection and service periods for the brake linings. If it is found that the brake effectiveness has dropped to a noticeable degree (and the system has been properly bled and pedal free travel is correctly adjusted) the axle ends should be removed so that linings may be inspected to determine their further serviceability.

The original thickness of the brake disc lining is 0.221 inch. The disc lining is effective until it is worn to 1/16 inch thickness. If after inspection it is found that the lining is worn to the extent that it will not be effective until the next inspection period, it should be replaced. The brake piston lining when new is 0.649 inch thick to the step on the lining. This lining should also be replaced if it is determined that it will be worn to within 1/16 inch of step before the next inspection period.

Before replacing axle ends, check the cylinders for leakage. The actual presence of fluid, other than mere dampness, indicates a fluid leak. Correct leaks as necessary by replacing the piston seals after cleaning the pistons and seal grooves thoroughly.



INDUSTRIAL TRUCK DIVISION



Faint, illegible text in the bottom left section, possibly a technical specification or part list.

Faint, illegible text in the bottom right section, possibly a technical specification or part list.



**PARKING BRAKE ADJUSTMENT**

The mechanical "V" block type parking brake operates on the transmission drive shaft brake drum. The only adjustment necessary during the useful life of the brake lining, is a periodic adjustment of the linkage.

To adjust the linkage, remove the floor plates, and adjust the clevis on the linkage, so that the brake handle has 2 inches of upward travel, before resistance is noticed and the brake becomes applied.

The parking brake must be capable of holding the truck, with full rated load, on a 15% grade. This should be tested with the drivers seat occupied, parking brake applied and the truck out of gear. If brake operation is not satisfactory report to designated individual in authority.

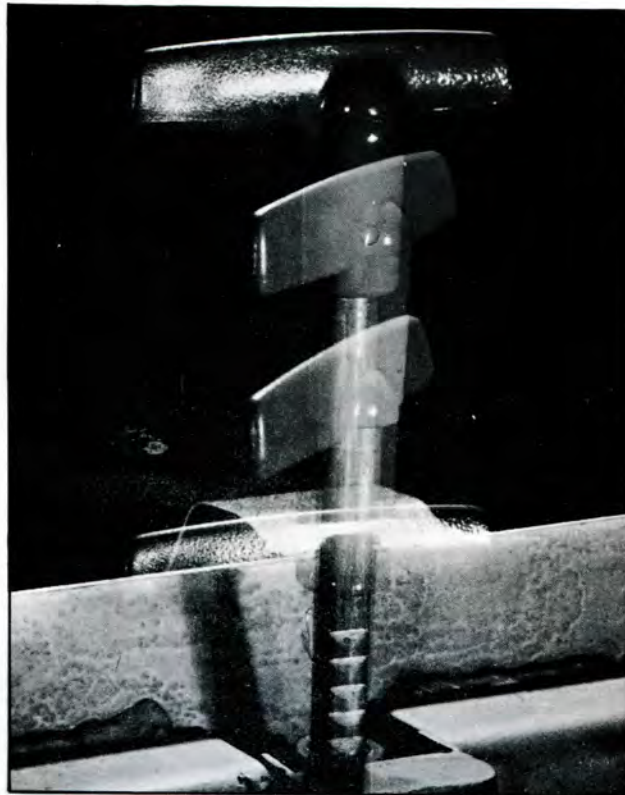


Plate 7482. Parking Brake

**COOLING SYSTEM**

Radiator Pressure Caps:

**WARNING**

USE EXTREME CARE IN REMOVING THE RADIATOR PRESSURE CAP. IN PRESSURE SYSTEMS, THE SUDDEN RELEASE OF PRESSURE CAN CAUSE A STEAM FLASH AND THE FLASH, OR THE LOOSENED CAP CAN CAUSE SERIOUS PERSONAL INJURY. LOOSEN CAP SLOWLY AND ALLOW STEAM TO ESCAPE.

1. Inspect pressure cap gasket and radiator filler neck to be sure they are providing a proper seal. If the rubber face of the valve is defective, a new cap should be installed.



Plate 6458. Radiator Pressure Cap

2. Inspect pressure cap for freedom of operation.

Pressure caps employ a spring loaded, rubber-faced valve which presses against a seat in the radiator top tank. Pressure caps employ either a vacuum valve held against its seat under spring pressure, or a weighted vacuum valve which hangs open until forced closed by a surge of vapor or coolant. Check to be sure components are free to operate.

**NOTE**

IF A NEW CAP IS REQUIRED, ALWAYS INSTALL A CAP OF THE SAME TYPE AND PRESSURE RATING. PRESSURE RATING 7 LB.

3. Inspect for dented or clogged overflow pipe. To remove clogged material, run a flexible wire through pipe until obstruction is removed.

When a pressure cap opens the sudden surge of vapor or liquid must pass thru the overflow pipe. If the pipe is dented or clogged, the pressure developed by the obstruction may cause damage to radiator or hoses.

Inspect and Clean Cooling System:

Check hose connections for coolant leaks as well as air leakage. Air leakage around hose connections allows oxygen into the system which is a major factor in corrosion.

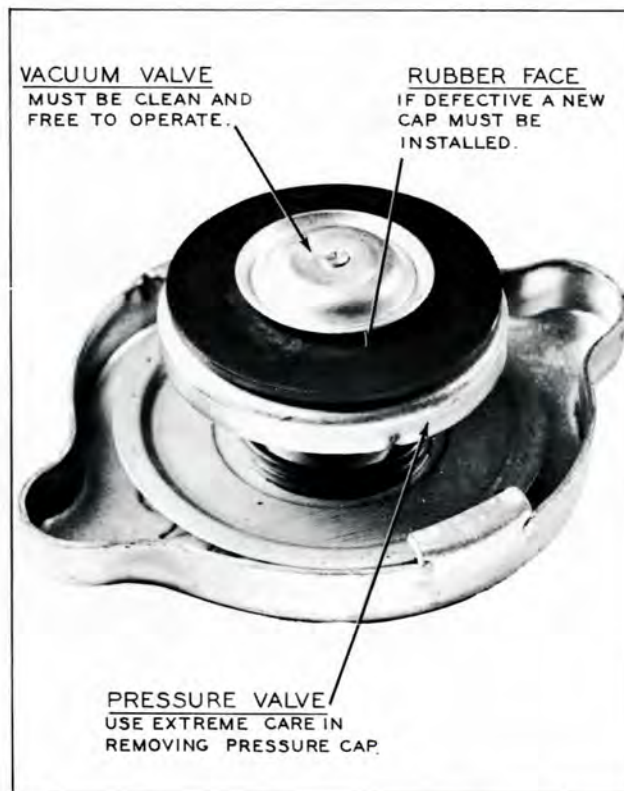


Plate 6459. Pressure Cap Gasket, Valve and Valve Gasket

**NOTE**

EXHAUST GAS LEAKAGE BETWEEN CYLINDER HEAD AND GASKET ALSO RESULTS IN CORROSION. IF EXHAUST GAS DISCHARGES INTO COOLANT, THE COOLANT AND THE GAS COMBINE TO FORM A VARIETY OF ACIDS. IT IS THEREFORE IMPORTANT THAT CYLINDER HEAD STUD NUTS BE DRAWN DOWN TO SPECIFICATIONS AS INSTRUCTED IN "ENGINE TUNE-UP".

## LUBRICATION AND PREVENTIVE MAINTENANCE

Using a washing soda solution, flush cooling system in the following manner:

1. Drain system.
2. Replace half of volume with fresh water. Refer to Specifications for capacity.
3. Boil other half of volume and add washing soda until no more will dissolve.
4. Add hot soda solution to cooling system (fill up).
5. Operate engine normally for 24 hours.
6. Drain, flush, refill with clean water to which a soluble oil has been added in a proportion of 1 ounce per gallon of water.

Maintaining the cooling system efficiency is important, as engine temperatures must be brought up to and maintained within satisfactory range

for efficient operation; however, must be kept from overheating, in order to prevent damage to valves, pistons and bearings. Continued overheating may cause internal damage, while continuously low operating temperature wastes fuel, increases engine wear and causes oil sludge and corrosion of engine parts.

Overcooling may be caused by operating conditions such as excessive idling, low speeds and light loads during cold weather. Overheating may be caused by faulty thermostat, clogged radiator or an improperly adjusted fan belt.

**CAUTION**

NEVER POUR COLD WATER OR COLD ANTI-FREEZE INTO THE RADIATOR OF AN OVERHEATED ENGINE. ALLOW THE ENGINE TO COOL AND AVOID THE DANGER OF CRACKING THE CYLINDER HEAD OR BLOCK. KEEP ENGINE RUNNING WHILE ADDING WATER.

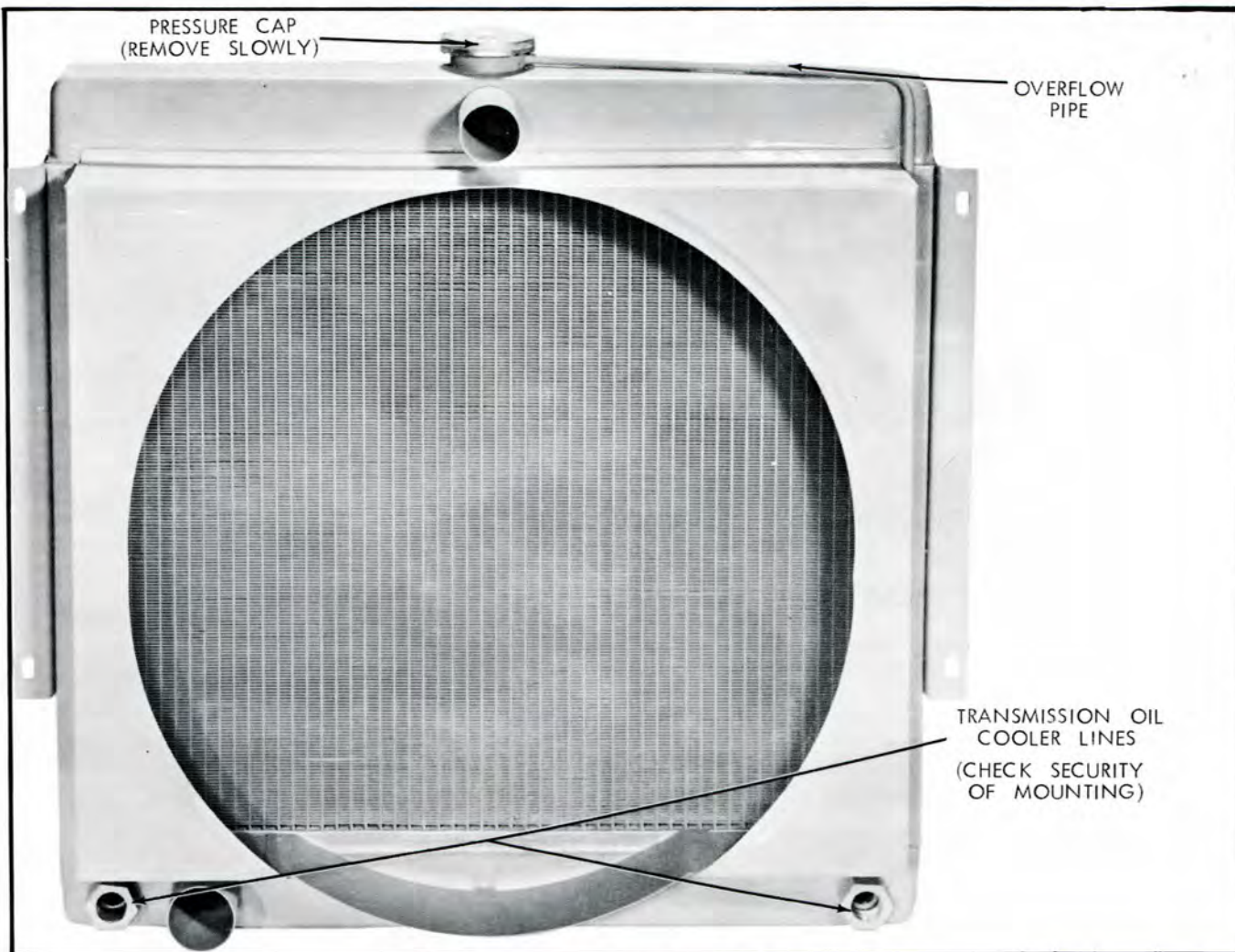


Plate 6460. Typical Radiator



# INDUSTRIAL TRUCK DIVISION



INDUSTRIAL TRUCK DIVISION

The Industrial Truck Division is a leading manufacturer of a wide variety of trucks and trailers for use in industrial, commercial and agricultural applications. Our products are designed for maximum efficiency, reliability and safety.

Our product line includes a wide range of trucks and trailers, including dump trucks, flatbed trucks, and more. We offer a variety of configurations and options to meet your specific needs.

## TRUCKS

Our trucks are designed for maximum efficiency and reliability. They are built with heavy-duty components and are capable of handling the most demanding work environments. We offer a variety of configurations and options to meet your specific needs.

The Industrial Truck Division is a leading manufacturer of a wide variety of trucks and trailers for use in industrial, commercial and agricultural applications.

Our products are designed for maximum efficiency, reliability and safety. We offer a variety of configurations and options to meet your specific needs.

Our product line includes a wide range of trucks and trailers, including dump trucks, flatbed trucks, and more. We offer a variety of configurations and options to meet your specific needs.

Our trucks are designed for maximum efficiency and reliability. They are built with heavy-duty components and are capable of handling the most demanding work environments.

We offer a variety of configurations and options to meet your specific needs. Our trucks are designed for maximum efficiency and reliability.

Our product line includes a wide range of trucks and trailers, including dump trucks, flatbed trucks, and more. We offer a variety of configurations and options to meet your specific needs.

Our trucks are designed for maximum efficiency and reliability. They are built with heavy-duty components and are capable of handling the most demanding work environments.

We offer a variety of configurations and options to meet your specific needs. Our trucks are designed for maximum efficiency and reliability.



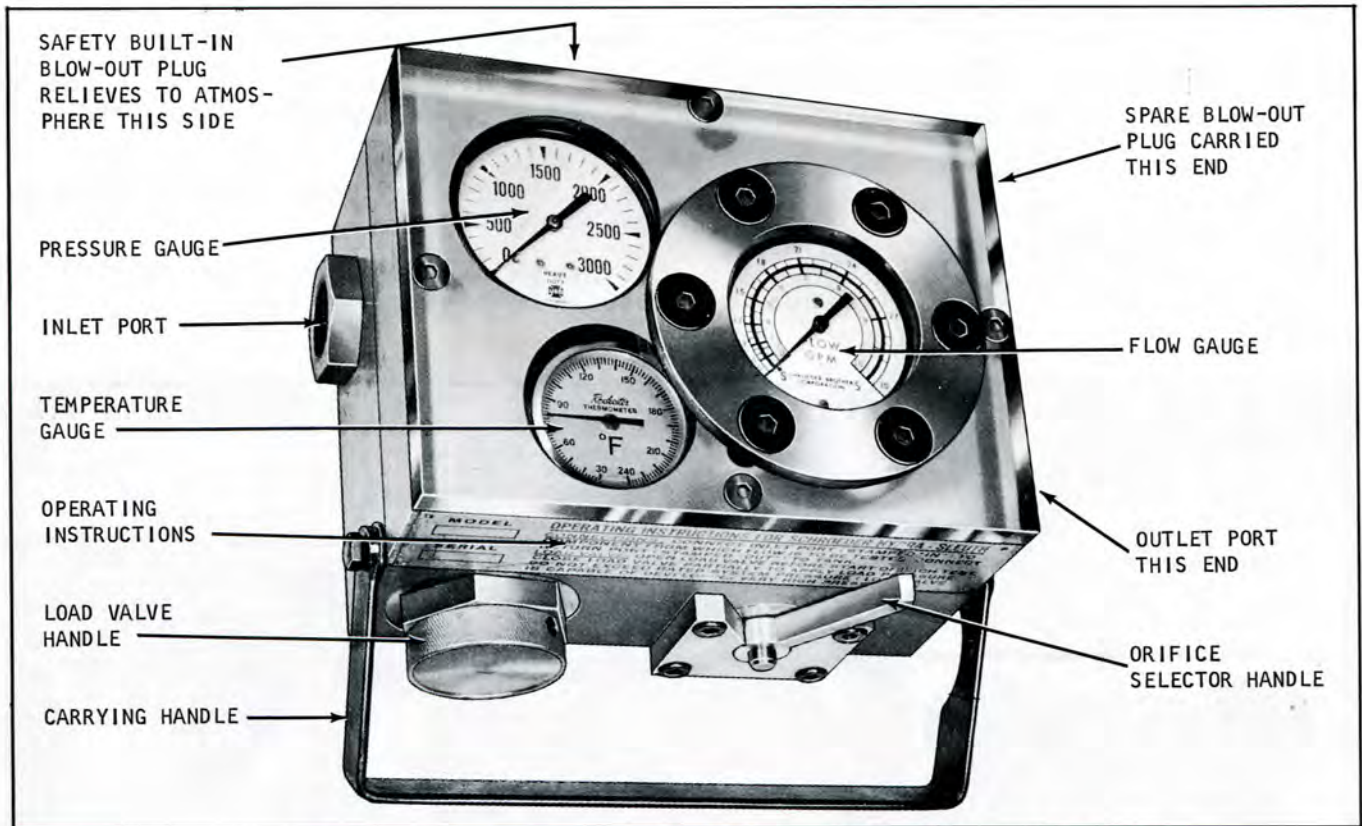


Plate 6747. Schroeder Hydraulic Circuit Tester CLARK PART NUMBER 1800060

PRESSURE GAUGE

Reads directly in pounds per square inch (PSI).

TEMPERATURE GAUGE

Reads directly in degrees Fahrenheit and indicates the temperature of the oil passing through the instrument.

FLOW GAUGE

Reads two scales in gallons per minute.

- 0 - 30 gallons
- 9 - 30 gallons

Read the scale that corresponds with the orifice selector position.

Turn orifice selector to the left (counter-clockwise) to read 10 gallon scale.

Turn orifice selector to the right (clockwise) to read 30 gallon scale.

You may switch from one scale to the other, while operating machine. Always start on 30 gallon scale.

LOAD VALVE

The load valve is a flow restrictor or shut off valve. Turning the valve to the right throttles flow through the Hydra-Sleuth, thus the operator may load a hydraulic pump or circuit to the desired test pressure, simulating work.

SAFETY PLUG

Located opposite the load valve this plug protects the Hydra-Sleuth and the tested system from pressures in excess of 3200 PSI. When pressure becomes higher the plug will rupture and dump oil to atmosphere.

HYDRAULIC FLUID

Unless marked to the contrary, the unit is for use with petroleum, hydraulic fluids.

HOW TO CONNECT THE PORTABLE TESTER

Using a 1/2" hose or larger, connect tester INLET PORT to the flow to be tested. Connect the tester outlet port to reservoir fill port, or system return line.

HYDRA-SLEUTH ADJUSTMENTS BEFORE OPERATION

A. Depending on flow (GPM) to be checked choose proper orifice. (It is good practice to start always on 30 gallon scale.)

B. Fully open load valve by turning all the way to the left.

HYDRA-SLEUTH ADJUSTMENTS DURING OPERATION

I. Turn load valve to right to develop test pressures.

**CAUTION**

LOAD VALVE IS CAPABLE OF VERY HIGH PRESSURES.

A. Always start test with load valve fully open.

B. Do not exceed design pressure of system under test.

C. Keep load pressures within range of the Hydra-Sleuth pressure gauge.

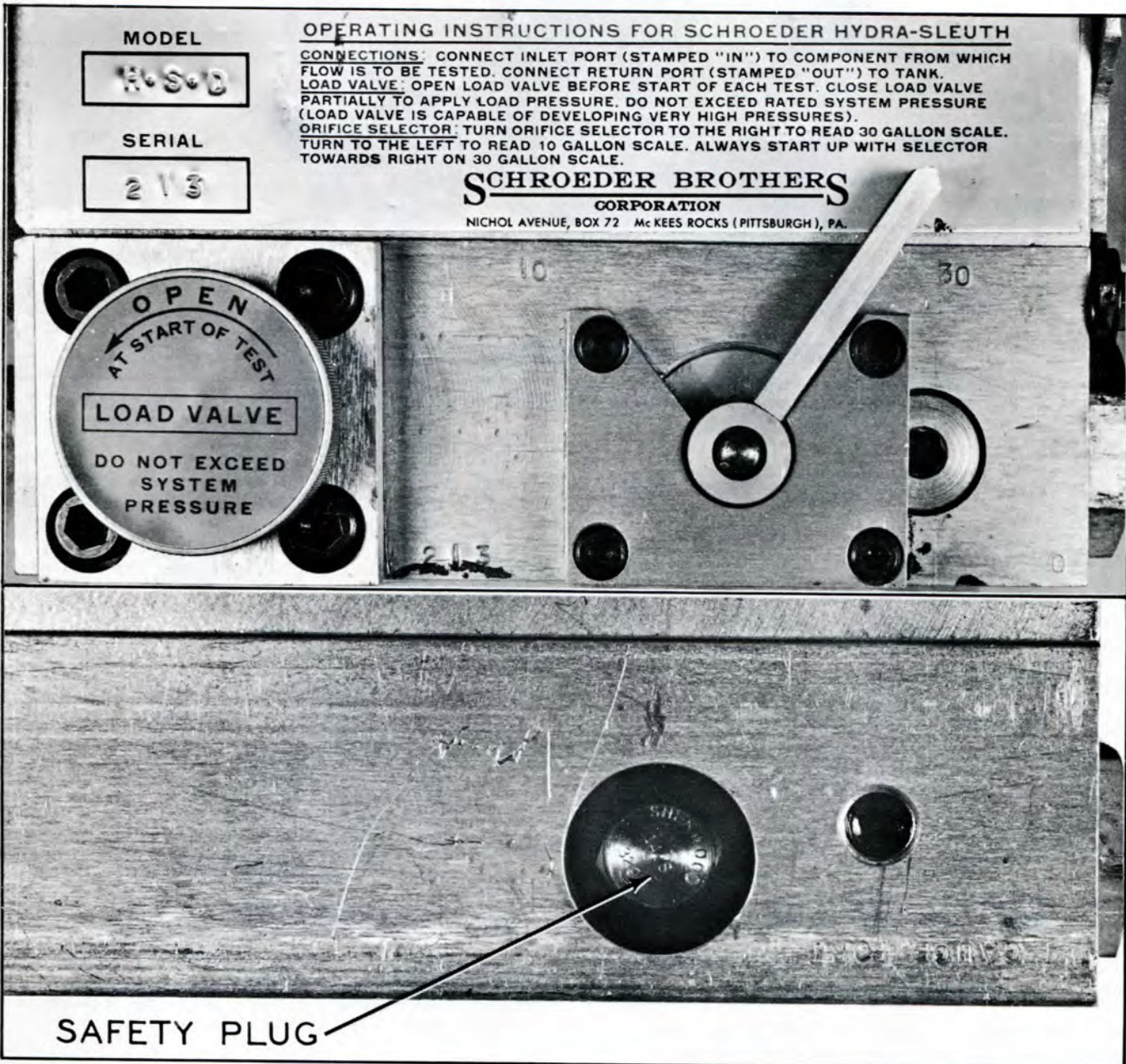


Plate 6748. Schroeder Hydraulic Circuit Tester

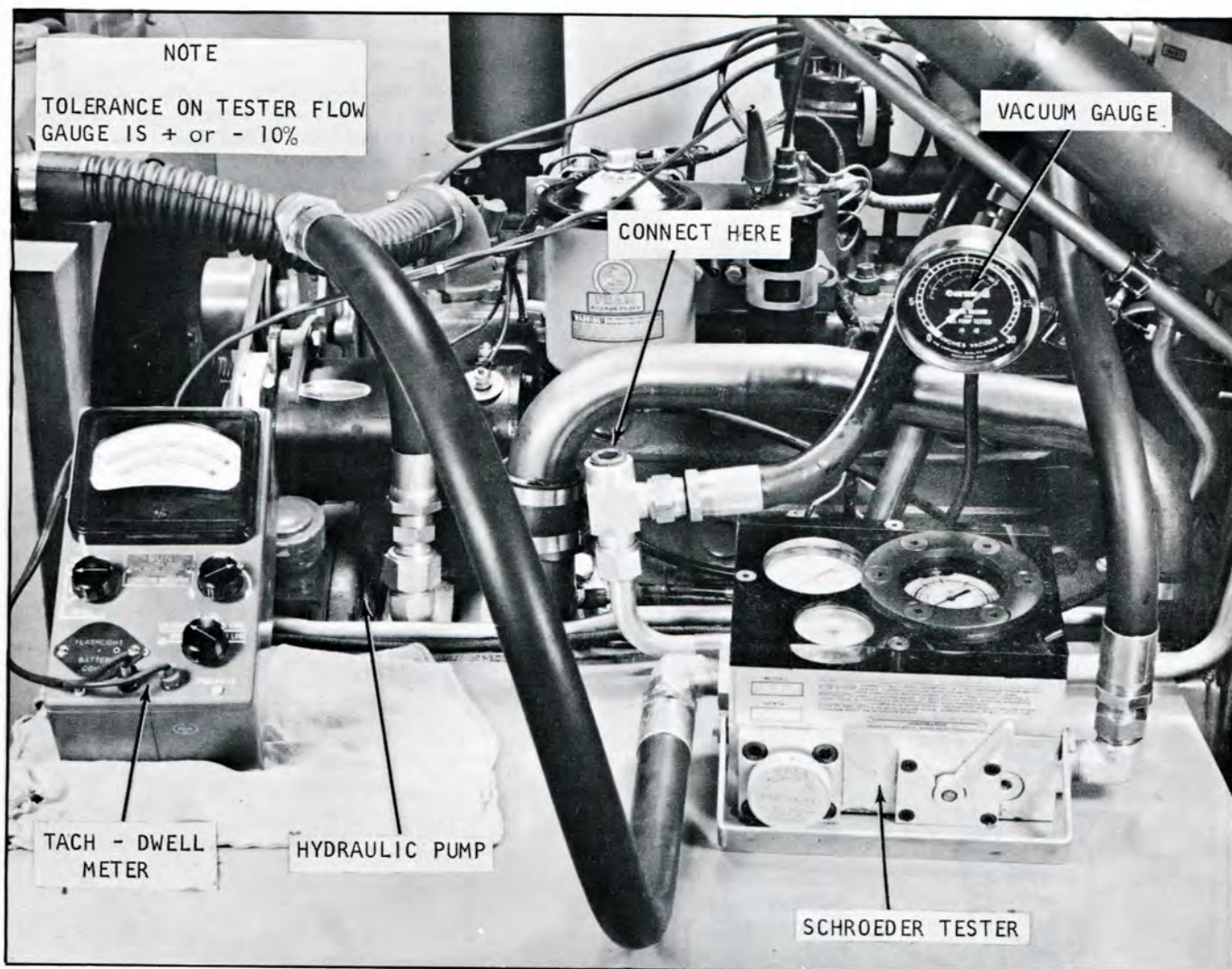


Plate 6749. Flowmeter Hookup

**HOOK UP FLOWMETER**

Install the high pressure hose onto the pump as shown, see Plate 6749. Attach the return line hose as shown in Plate 6749.

**TESTING PUMP OUTPUT**

1. Start the Tractor engine, and set speed to the exact R.P.M. stated in the chart below.

2. To heat up oil, apply the load valve until pressure reaches 1000 P.S.I. CAUTION: APPLY PRESSURE GRADUALLY. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN "BLOWING-OUT" THE FLOWMETER RELIEF PLUG.

3. After the oil has come up to test temperature (120°F.) and the flow gauge needle is stabilized, apply the load valve GRADUALLY until desired pressure is achieved. Then stabilize the pressure needle. NOTE: IT WILL BE NECESSARY TO INCREASE TRACTOR SPEED SLIGHTLY AS PUMP MUST BE TESTED UNDER LOAD (AT SPECIFIED R.P.M.)

CAUTION: LIMIT TIME THE LOAD VALVE IS SET FOR A READING OF 2000 P.S.I. TO 30 SECONDS EXTENDED PERIOD OF TIME WITH MAXIMUM READING COULD CAUSE DAMAGE.

4. Read the flow gauge. It should read reasonably close to the specifications for a new pump as listed below.

ENGINE R.P.M.	P.S.I.	G.P.M.
2250	2000	17

## MAIN HYDRAULIC SYSTEM PRESSURE CHECK

The hydraulic relief valve setting may also be checked with the hydraulic circuit tester.

If a circuit tester is not available the relief valve setting may be checked in the following manner.

1. Provide a means for connecting a 0-4000 P.S.I. pressure gauge at the inlet side of the valve. A tee at the inlet port may be used. See Plate 7333.

2. System pressure should be checked with the engine running at governed speed. Move lift lever to "raise" position. When forks reach maximum lift height, check gauge reading. Pressure should be within the limits listed in Specifications. If adjustment is necessary remove acorn nut at valve and turn adjuster clockwise to raise pressure, counterclockwise to lower. After correct adjustment is obtained replace acorn nut.

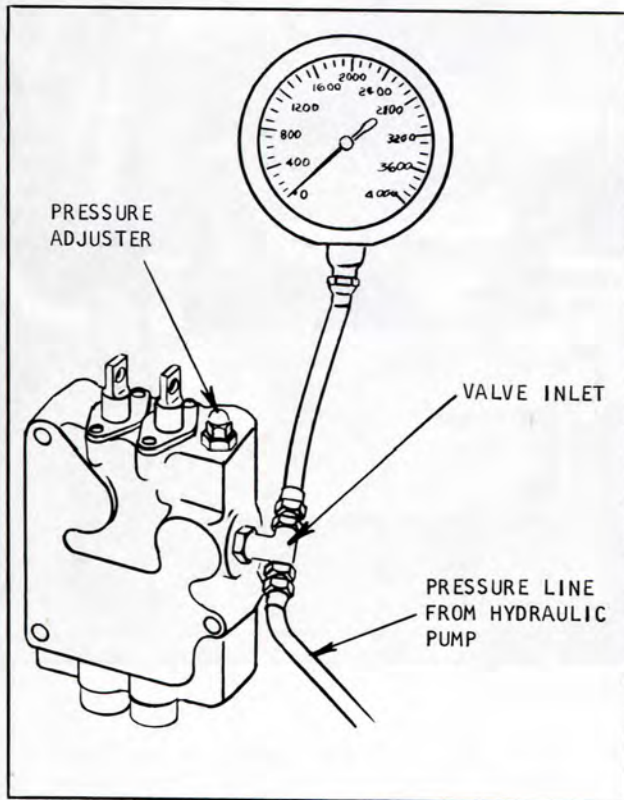


Plate 7333. Main Hydraulic System  
Pressure Check



TRANSMISSION STALL AND PRESSURE CHECKS

Minimum Tools Required

- 1 - Pressure Gauge 0-250 PSI
- 1 - Tachometer

Before making transmission checks the machine should be steam cleaned. It is important that the radiator be clean externally and internally so that it is capable of maintaining proper cooling for the engine and transmission.

1. Operate engine 3 to 4 minutes to fully charge the transmission plumbing and the torque converter. With the engine operating at idle and the transmission in "Neutral" check the fluid level on the dipstick. Fill if necessary to the "Cold Full" mark or the "Hot Full" mark, depending upon the temperature of the transmission. Use Type "A", Suffix "A" Automatic Transmission Fluid, Clark part #879803. Containers must be imprinted AQ-ATF.

2. Check brake pedal free travel.

The hydraulic inching (brake) pedal should contact the floorboard when in the released (up) position. Refer to page 100H-302 for explanatory illustrations on Pedal Free Travel.

3. With a tachometer, check engine for governed speed at full throttle. The unloaded engine RPM should be set at 2400.

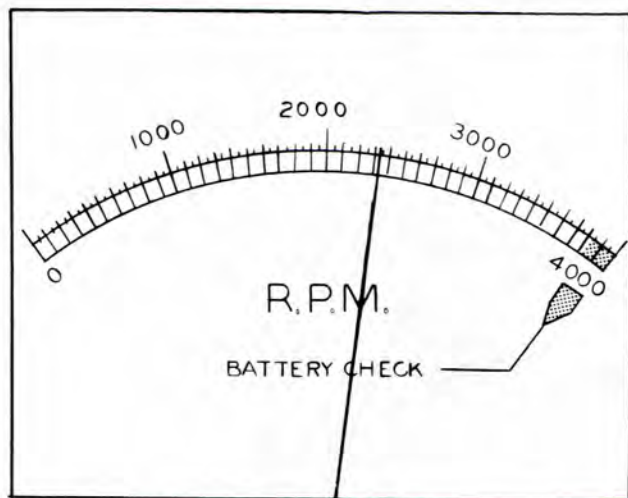


Plate 6683. Engine RPM (no load)

4. Check governed engine speed with partial load. With engine at full throttle and upright in full backward tilt, momentarily hold the tilt lever back to load the engine. With the engine loaded in this manner the approximate engine RPM should be 2200.

NOTE

Engine must be properly tuned before making transmission stall checks.

CAUTION

PROLONGED STALLING OF THE CONVERTER CAN CAUSE INTERNAL DAMAGE TO THE CONVERTER. STALL CONVERTER ONLY LONG ENOUGH TO ATTAIN THE PEAK RPM READING, (MAXIMUM 30 SECONDS).

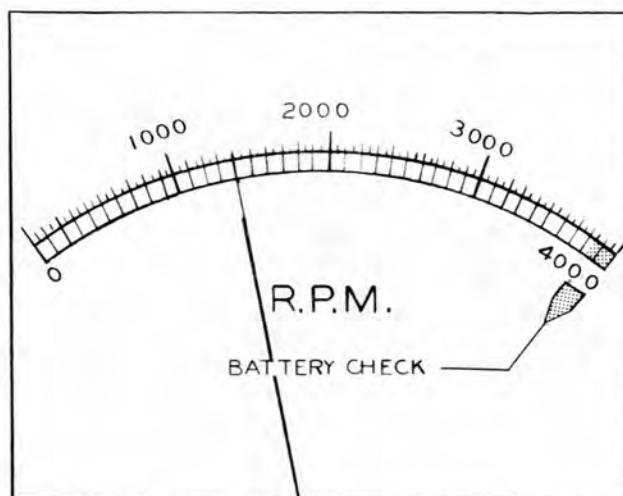


Plate 6684. Normal Engine Stall

5. With a capacity load on the forks, check for normal stall RPM by positioning machine against an immovable object. Place the machine in gear and accelerate engine to full throttle.

Normal Stall for F-209 Engine.....  
.....1300 to 1400 RPM

Normal Stall for F-244 Engine.....  
.....1450 to 1550 RPM

WHEN APPLYING BRAKE HYDRAULIC PRESSURE  
92# ± 5 TO INCHING VALVE "F" AND "R"  
CHECKED INDIVIDUALLY MUST DROP OFF TO  
3# ± 2 P.S.I. MAX. WITH INCHING BREAK  
OFF POINT OF 55# ± 5

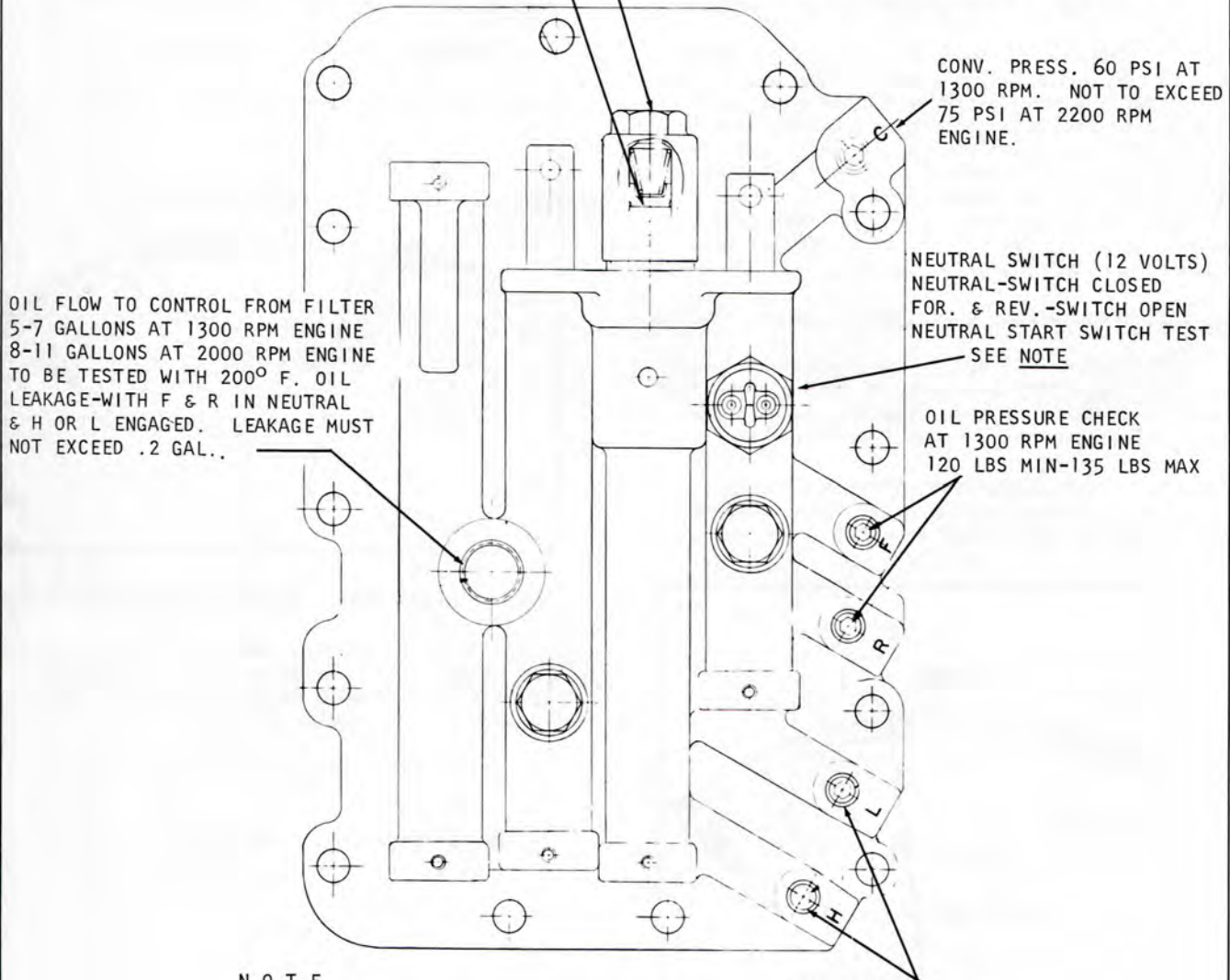
IMMERSE IN UCON-1145 FLUID BEFORE ASSEM.

UNLESS OTHERWISE SPECIFIED

IMMERSE ALL OIL SEALS IN TYPE "A"  
TRANSMISSION FLUID BEFORE ASSEMBLY

OIL ALL "O" RINGS BEFORE ASSEMBLY

TIGHTEN ALL CAP SCREWS 20-25 FT. LBS. TORQUE



NOTE

**NEUTRAL START SWITCH TEST**

- 1-WIRE SWITCH INTO TEST STAND LIGHT CIRCUIT
- 2-WITH ENGINE RUNNING & TRANSMISSION IN LOW  
FOR., NUDGE CONTROL FOR. & REV. SPOOL  
SLOWLY TOWARD NEUTRAL. IF SWITCH DOES NOT  
MAKE CONTACT REPEAT STARTING IN LOW REV.  
IF IN EITHER TEST CONTACT IS MADE WHEN NOT  
IN DEAD NEUTRAL, SWITCH IS TO BE SHIMED,  
TILL TEST SHOWS PROPER FUNCTION.

**OIL PRESSURE CHECK**

- AT 1300 RPM ENGINE-150 LBS. MIN.
- AT 2200 RPM ENGINE-165 LBS. MAX.

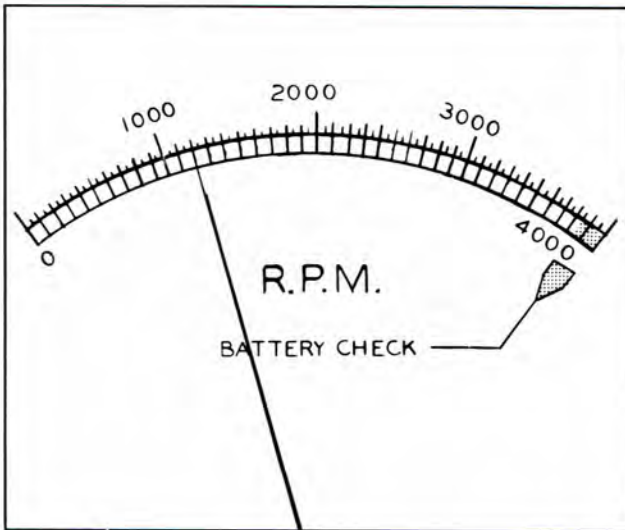


Plate 7327. Interim Stall

If the engine stall R.P.M. is within the following range -- loss of engine power is indicated.

- F-209 Engine 1000 to 1300 R.P.M.
- F-244 Engine 1150 to 1450 R.P.M.

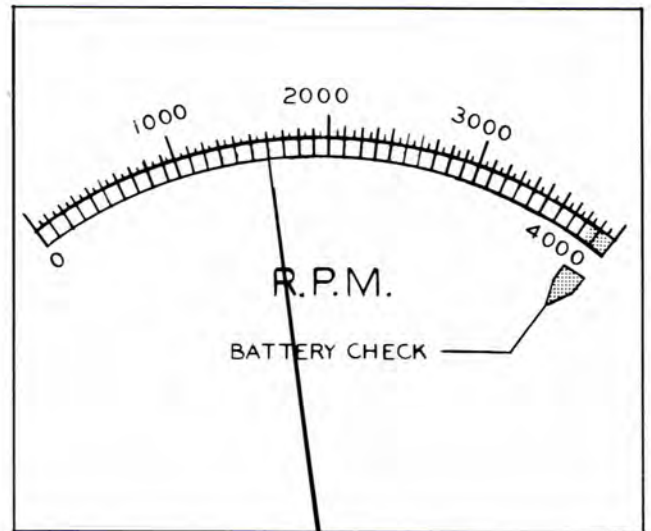


Plate 7328. High Engine Stall

If the engine stall R.P.M. is within the following range -- either slippage of the selector packs or low oil pressure is indicated.

- F-209 Engine 1450 R.P.M. and above.
- F-244 Engine 1600 R.P.M. and above.

**NOTE**

ANY STALL READING OTHER THAN NORMAL SHOULD BE REPORTED TO DESIGNATED PERSON IN AUTHORITY.

**Transmission Pressure Checks**

The transmission pressure checks are made at the testing ports of the control cover. See Plate 7326.

1. Place heavy blocking under the upright rails and tilt upright forward until vertical. This will allow the drive wheels to clear the floor.

2. Install a 250 P.S.I. pressure gauge at one of the testing ports (whichever direction or range of speed being tested.) With shift lever in related position the pressure should be within the range as specified on Plate 7326.

If pressures are not within this range report to designated person in authority.

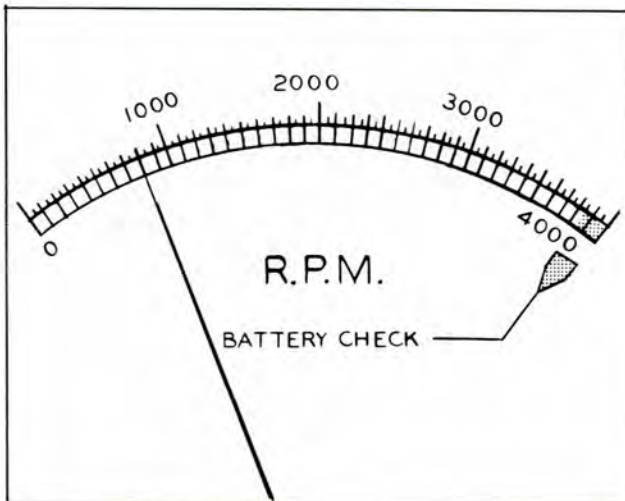


Plate 6686. Low Engine Stall

If the engine stall R.P.M. is within the following range -- converter malfunction is indicated.

- F-209 Engine 650 to 900 R.P.M.
- F-244 Engine 750 to 1000 R.P.M.



INDUSTRIAL TRUCK DIVISION



Faint, illegible text block located below the first diagram.

Faint, illegible text block located below the second diagram.

Faint, illegible text block located below the first diagram's text.



Faint, illegible text block located below the third diagram's text.

Faint, illegible text block located below the fourth diagram's text.



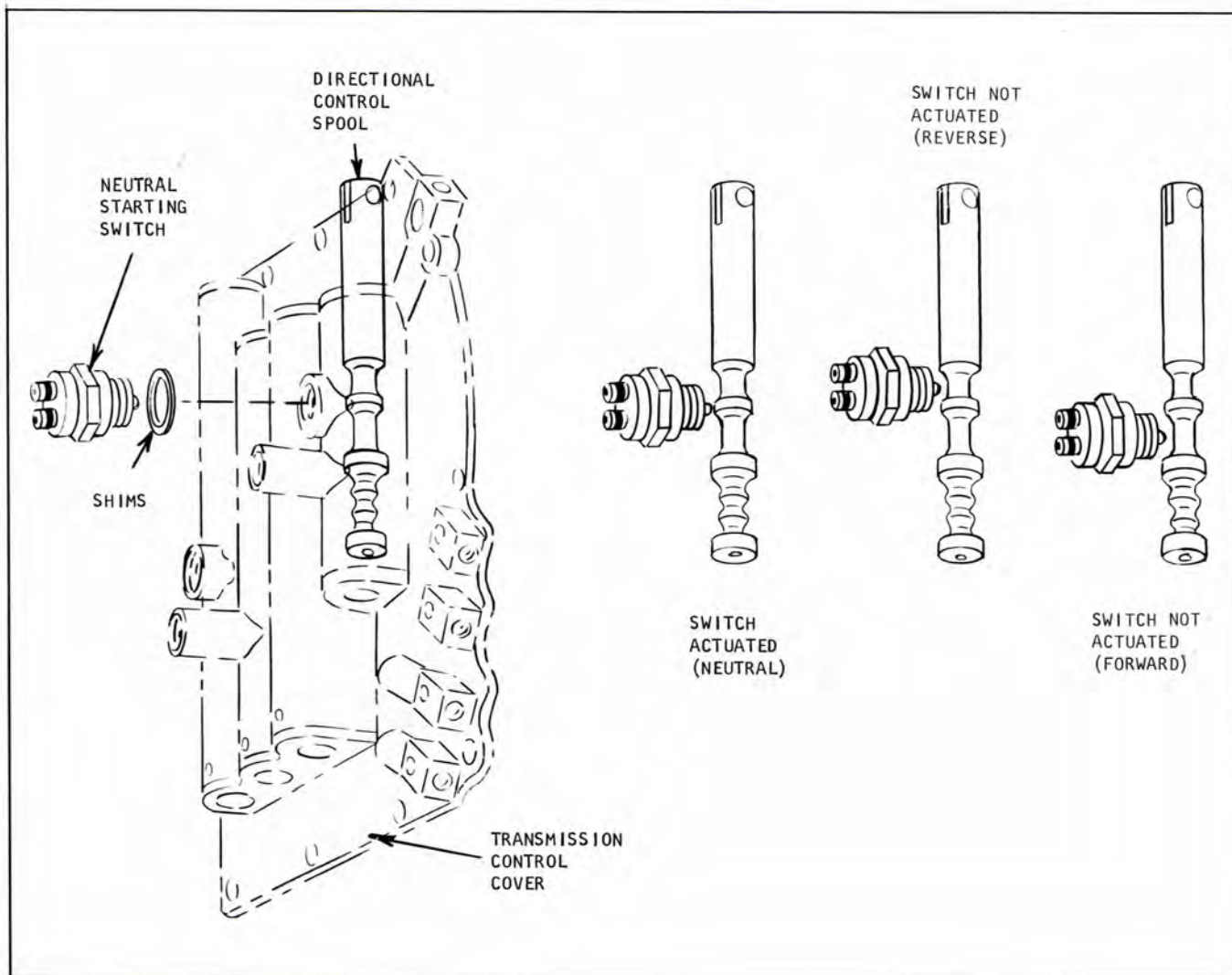


Plate 7300. Neutral Starting Switch

**NEUTRAL STARTING SWITCH**

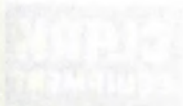
The neutral starting switch should be adjusted so that machine will not start except when the transmission control is in the (dead) neutral position.

**ADJUSTMENT CHECK**

1. With driver's seat occupied and transmission in gear hold starting switch in actuated position and gently move shift lever towards neutral position.

2. If engine does not start, repeat adjustment operation in opposite direction.

3. If engine starts, coming from either direction on the shift lever prior to reaching neutral, switch should be adjusted by means of shims underneath the switch until engine will not start unless it is in (dead) neutral; that is, vehicle will not move regardless of shift lever position during the starting cycle.



# INDUSTRIAL TRUCK DIVISION



INDUSTRIAL TRUCK DIVISION



INDUSTRIAL TRUCK DIVISION

The diagram shows the assembly of the rear axle and suspension components. The main parts include the axle shaft, differential housing, and suspension arms. The axle shaft is shown with its splines and the differential housing is shown with its internal components. The suspension arms are shown with their mounting points and the steering knuckle. The diagram is a technical drawing showing the exploded view of these parts.



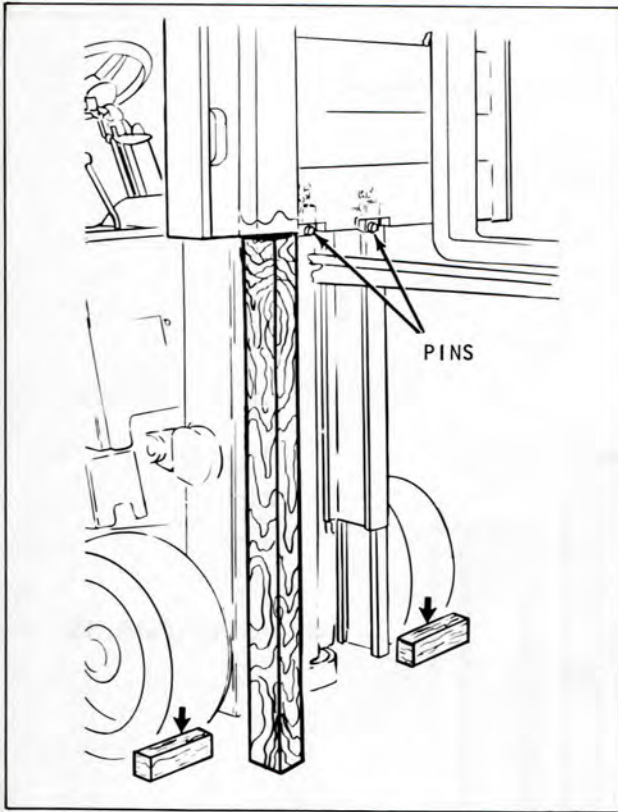


Plate 9593 Carriage Pin Replacement

Step 2. Remove anchor pins and replace with 3/8" x 2" bolts. **FOR SAFETY REASONS, REMOVE ONLY ONE PIN AT A TIME.** This will make pin removal easier when carriage is lowered.

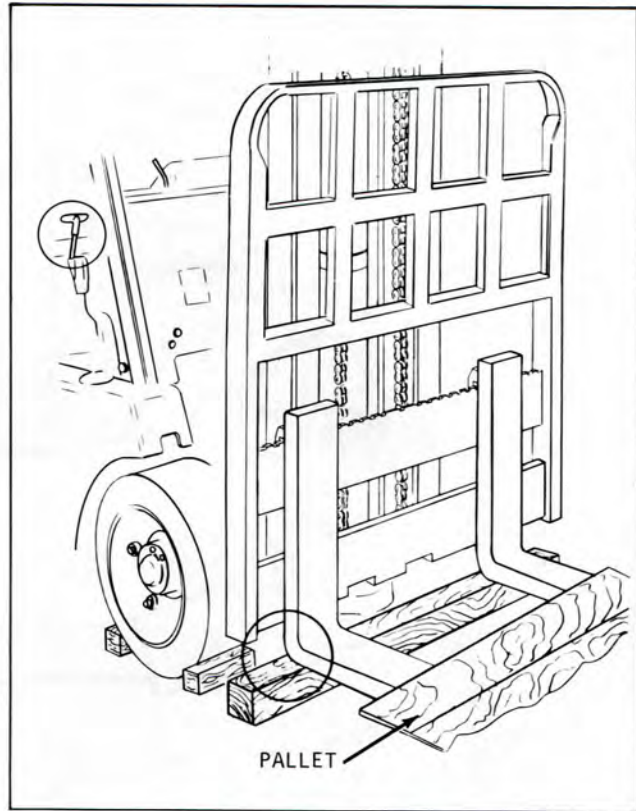


Plate 9560 Fork and Carriage Blocking

Step 3. Raise carriage off beam. Place beam on floor so, when lowered, the heel of the fork will rest on it as shown.

Step 4. Tilt upright full forward.



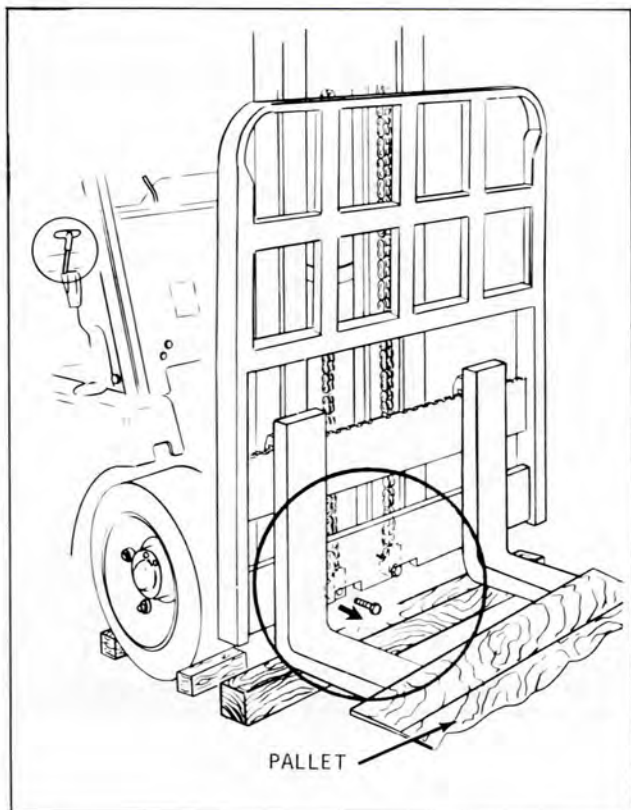


Plate 9561 Removing Bolts

Step 5. Remove 3/8" x 2" bolts. Place pallet on fork ends.

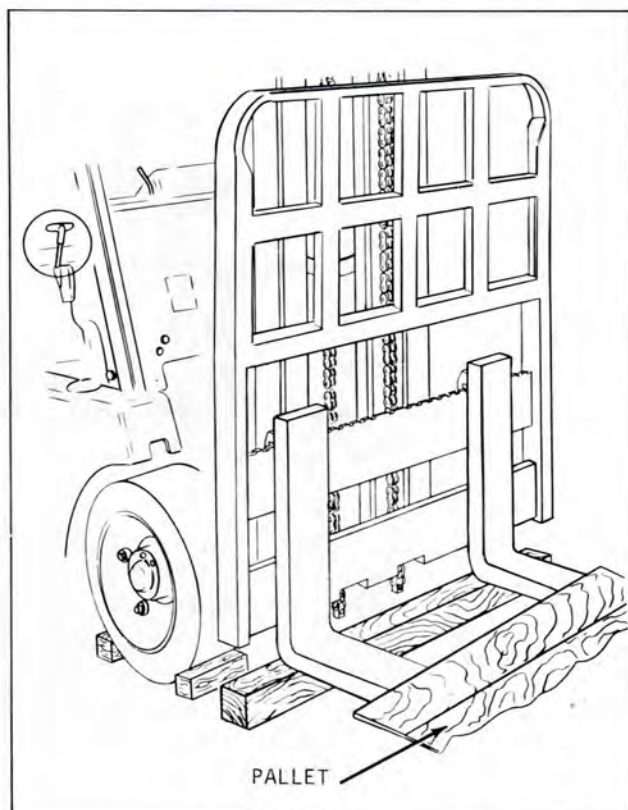


Plate 9562 Removing Chains From Anchors

Step 6. Pull chains out of carriage anchor brackets.

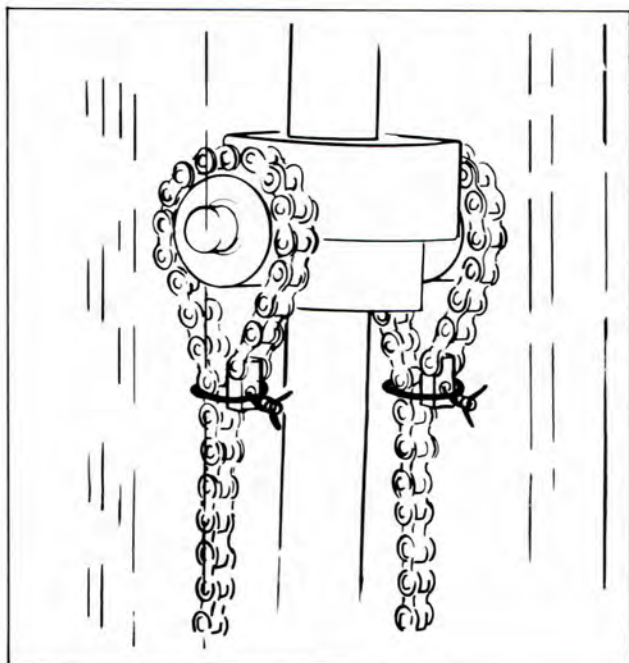


Plate 9563 Securing Chains (Typical)

Step 7. Wire chains around chain sheaves as shown

**N O T E**

Use the same method on all cylinders.

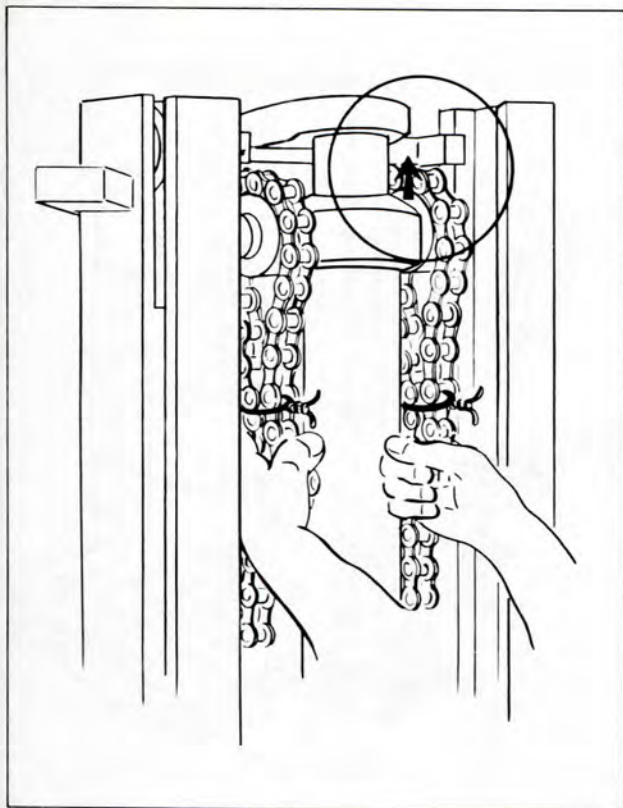


Plate 9564 Guiding Piston Head

Step 8. Guiding piston head with hands on chains raise piston to full up position.

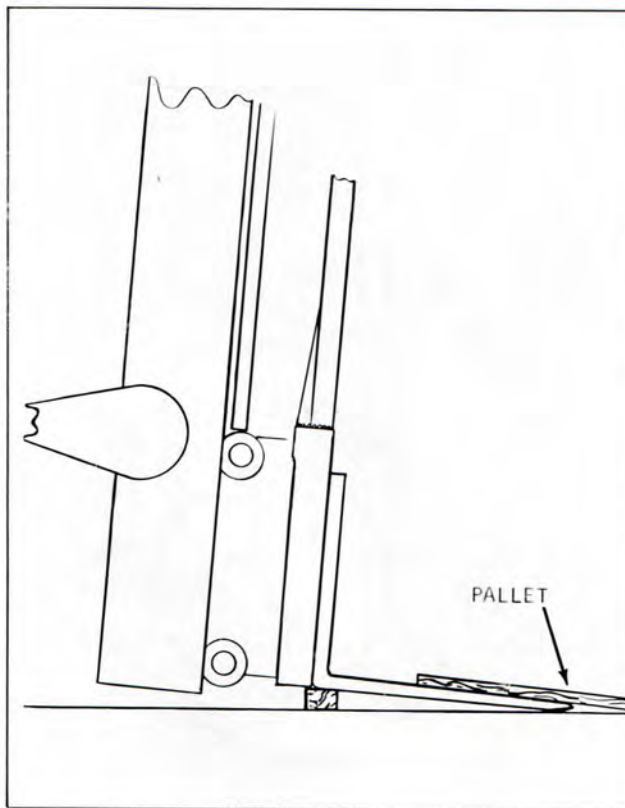


Plate 9565 Inner Rail Clearing Carriage Rollers

Step 9. Raise inner rail so it just clears upper carriage rollers. Leave upright at full forward tilt.

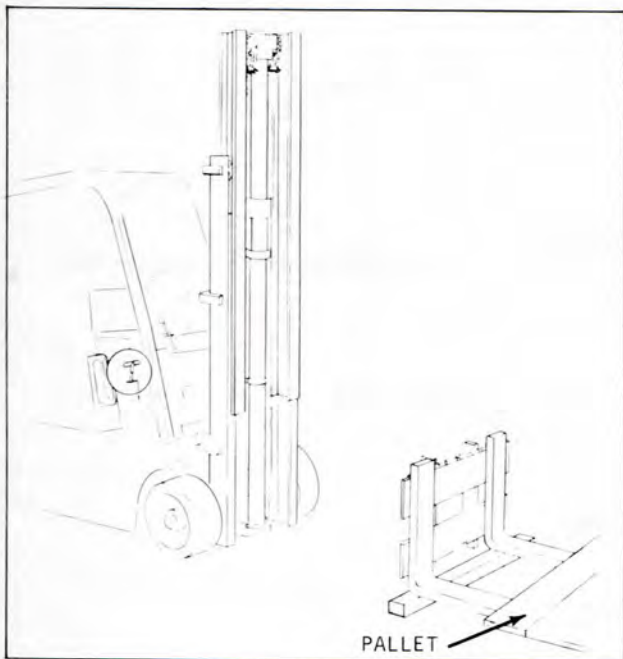


Plate 9566 Backing Machine Away From Carriage

Step 10. Remove blocks and release brake. Back machine away from carriage.

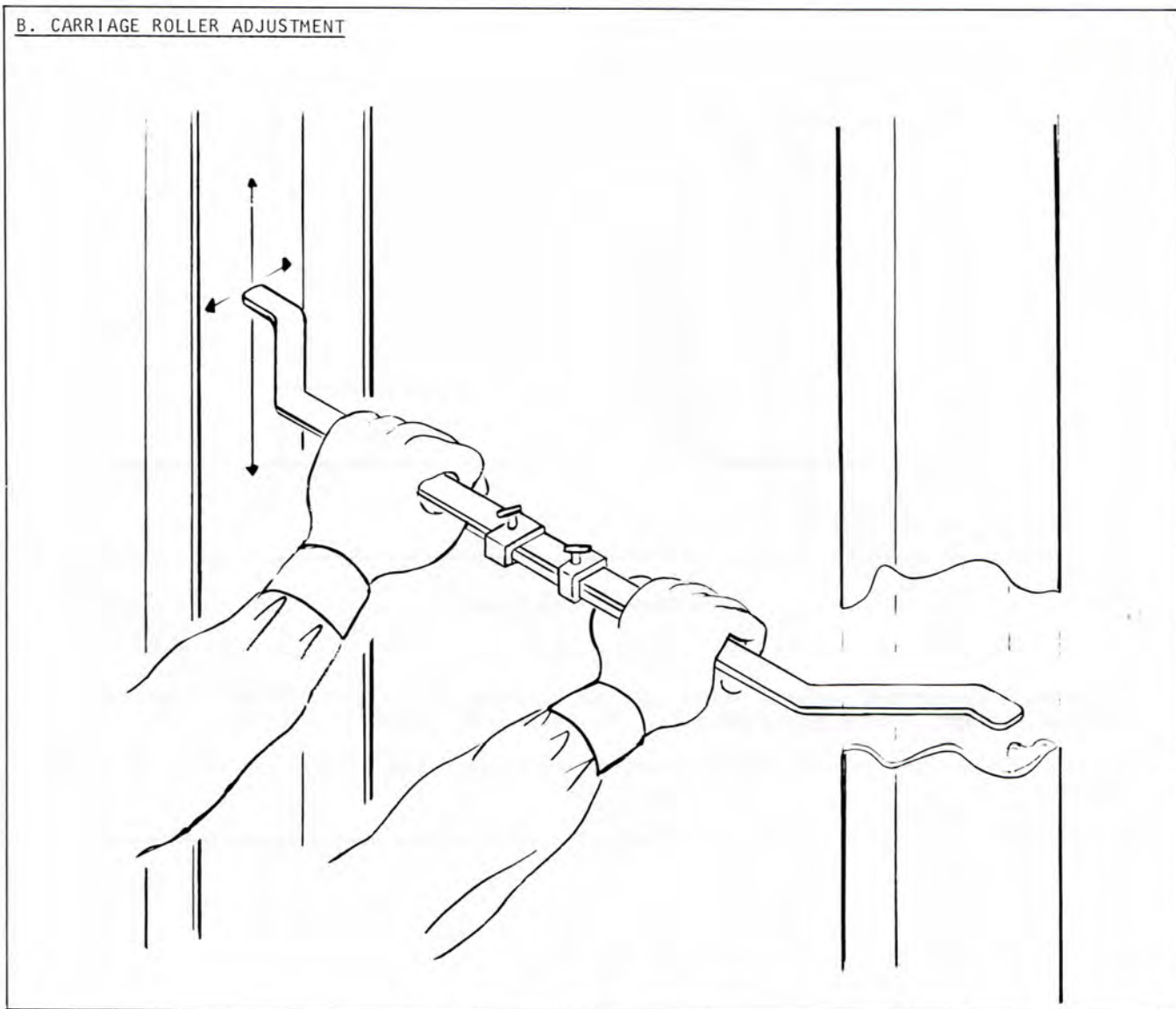
**B. CARRIAGE ROLLER ADJUSTMENT**

Plate 9567 Spanning Inner Rail

Step 1. Span inner rail with inside spanning tool to find the smallest distance between the rails. Lock tool in position.

## NOTE

FOR SIX ROLLER CARRIAGE ONLY

After finding the smallest distance between rails, place a shim between the spanning tool and the inner rail, then lock spanning tool in position.

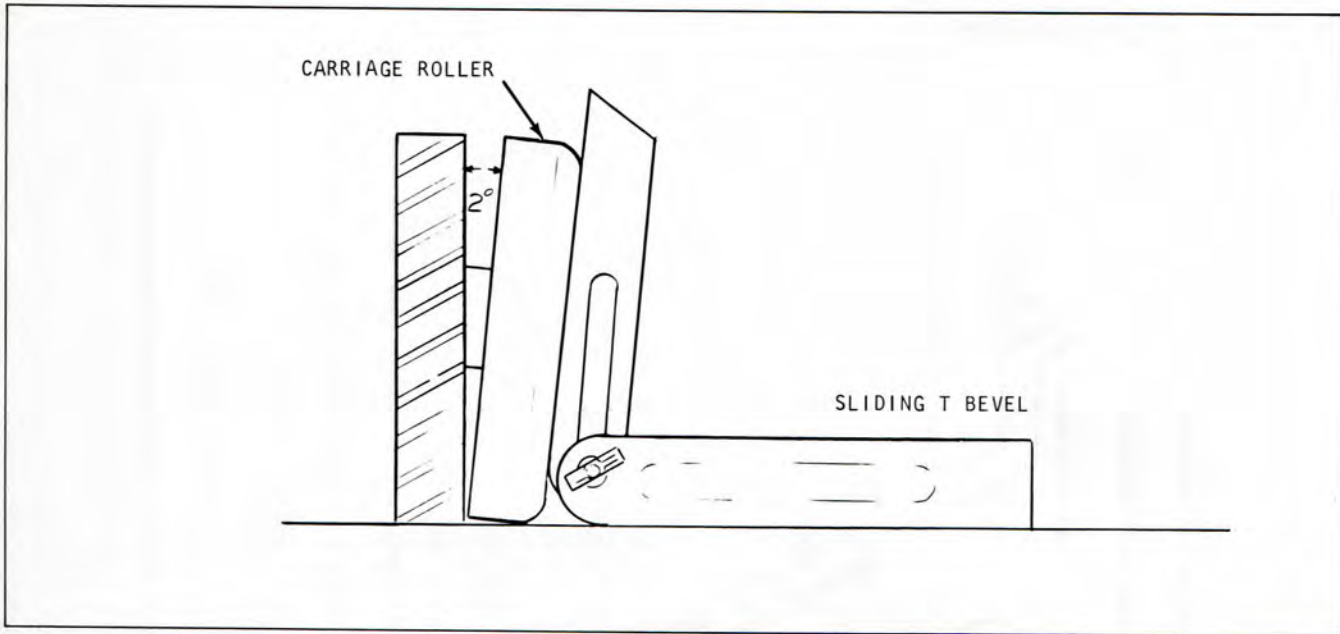


Plate 9589 Setting T Bevel

N O T E

Check angle of carriage rollers. Roller pin bosses are welded at  $2^\circ \pm 1/2^\circ$  and if damaged, replace carriage roller pin boss assembly. To obtain this, contact Central Parts.

To check roller angle use a Sliding T Bevel and Protractor. Lay one side against roller surface and lock in place.

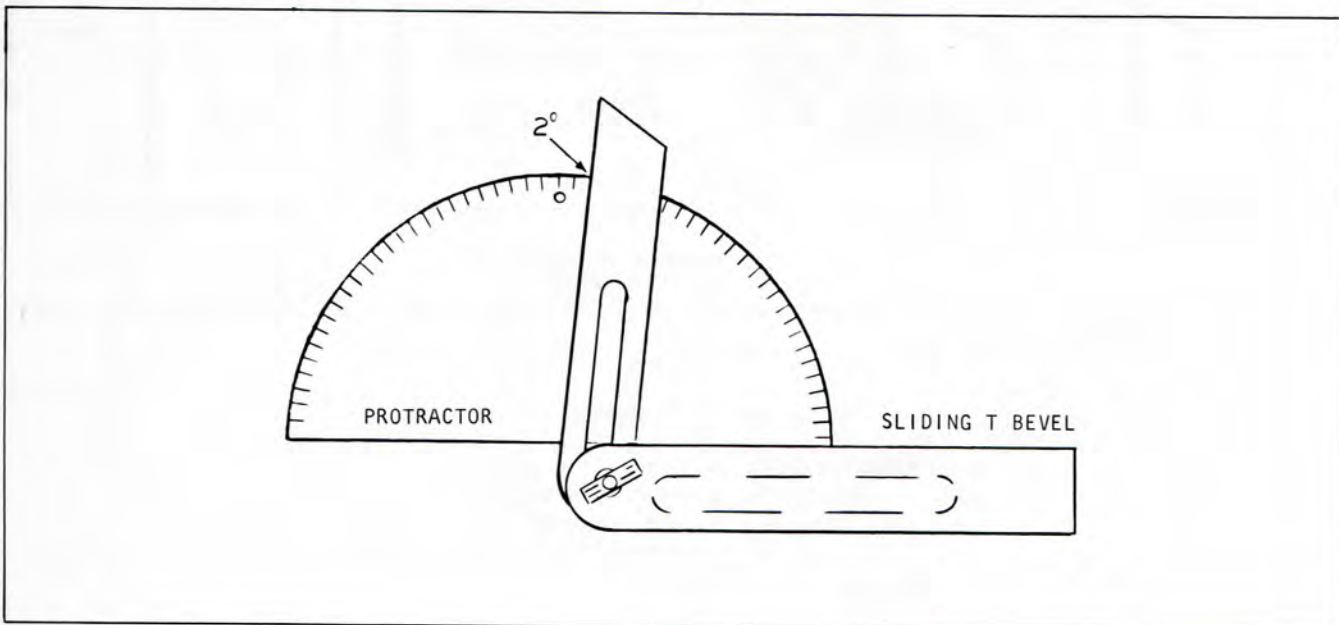


Plate 9590 Checking Roller Angle

Determine degree of angle by placing Protractor on Sliding T Bevel.

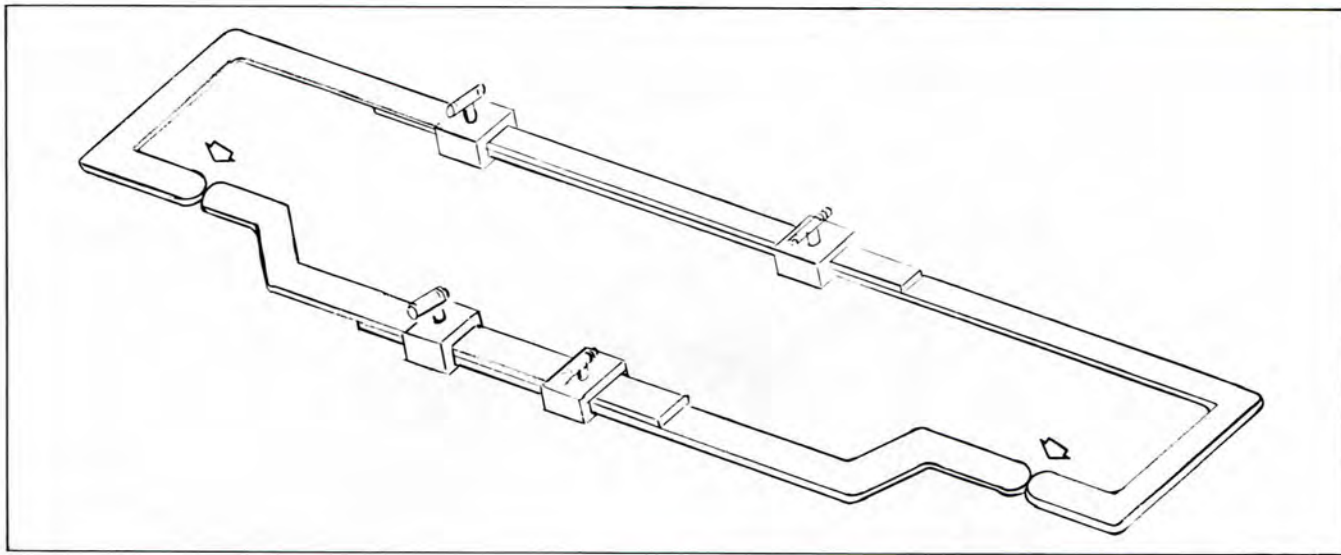


Plate 9568 Setting Outside Spanning Tool

Step 2. Set outside spanning tool to match inside spanning tool. Lock tool in position.

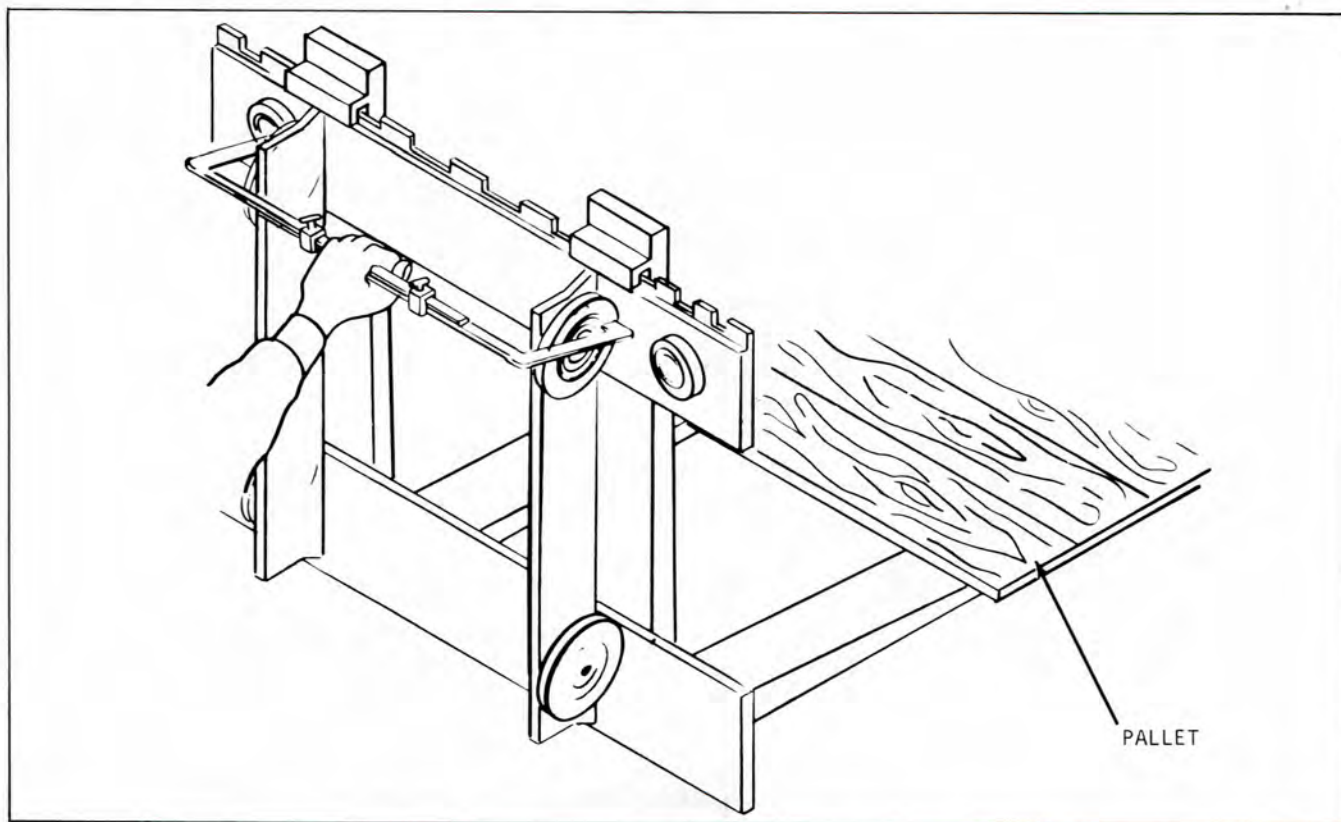


Plate 9569 Spanning Upper Rollers (Four Roller Carriage)

Step 3. Span upper carriage rollers at their outer most camber point. Add or subtract ...

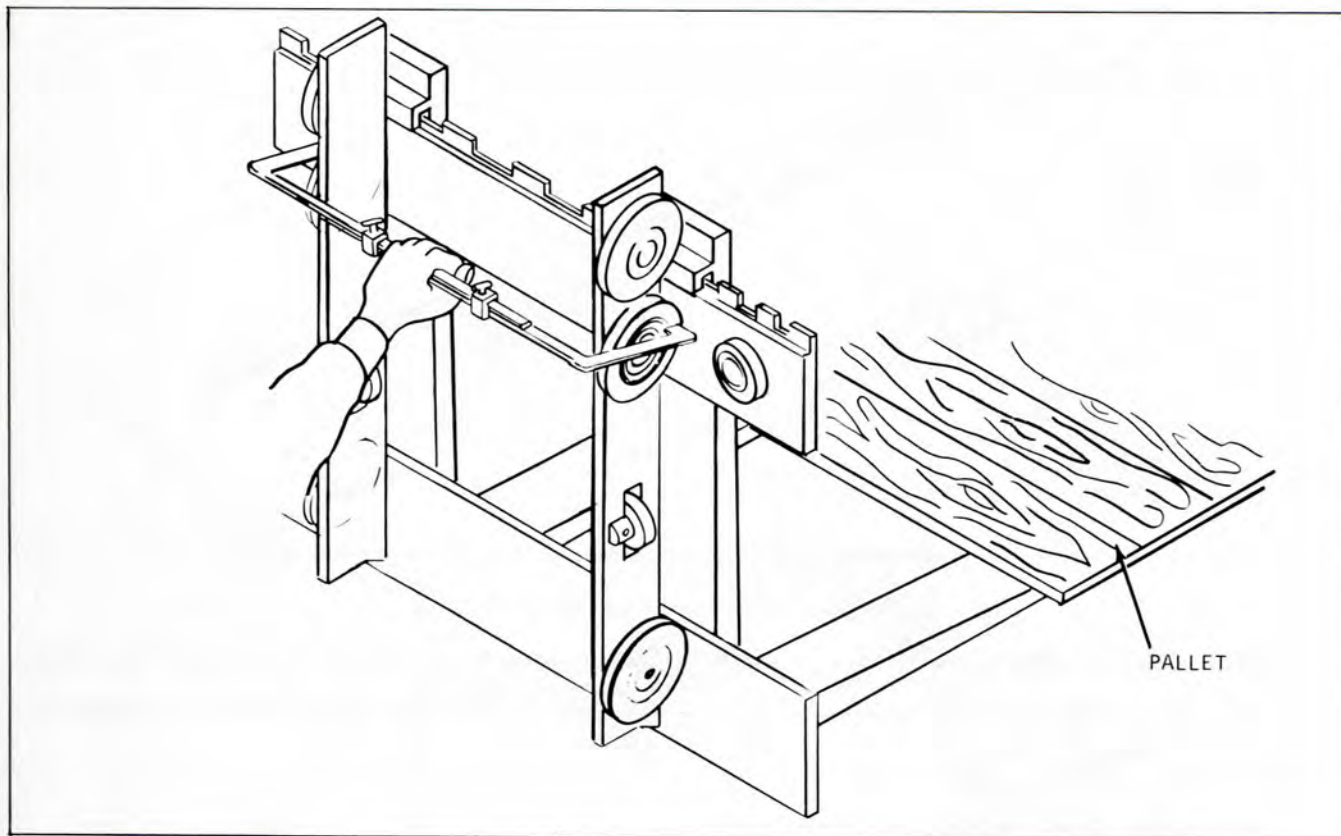


Plate 9570 Spanning Upper Rollers (Six Roller Carriage)

...shims at roller shaft to reach tool size.

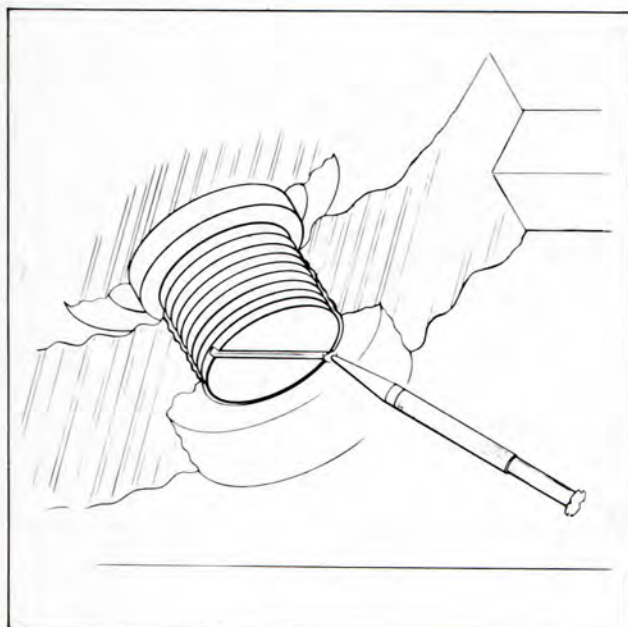


Plate 9571 Securing Outer Thrust Roller

#### NOTE

Before centering carriage rollers check outer thrust rollers for security and condition of bearings. If loose tighten and stake. If worn replace.

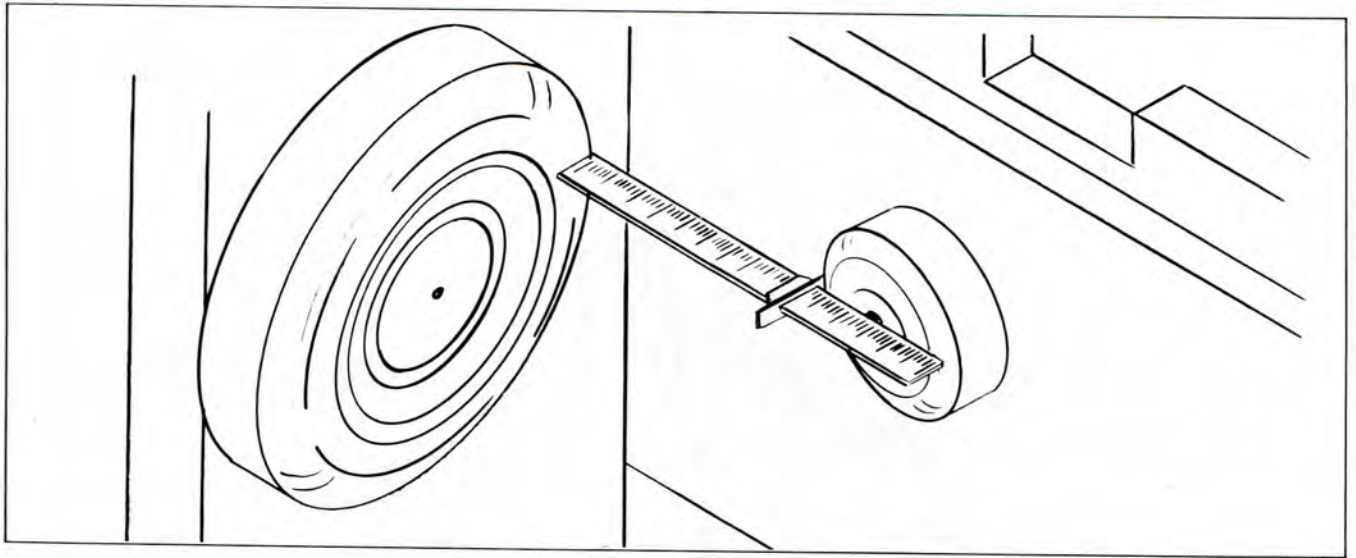


Plate 9572 Centering Carriage Rollers

Step 4. Center carriage rollers within outer thrust rollers by placing 6" scale on the carriage roller surface and measuring the distance to the outer thrust roller face. Add or subtract shims from one roller to the other to make measurement equal.

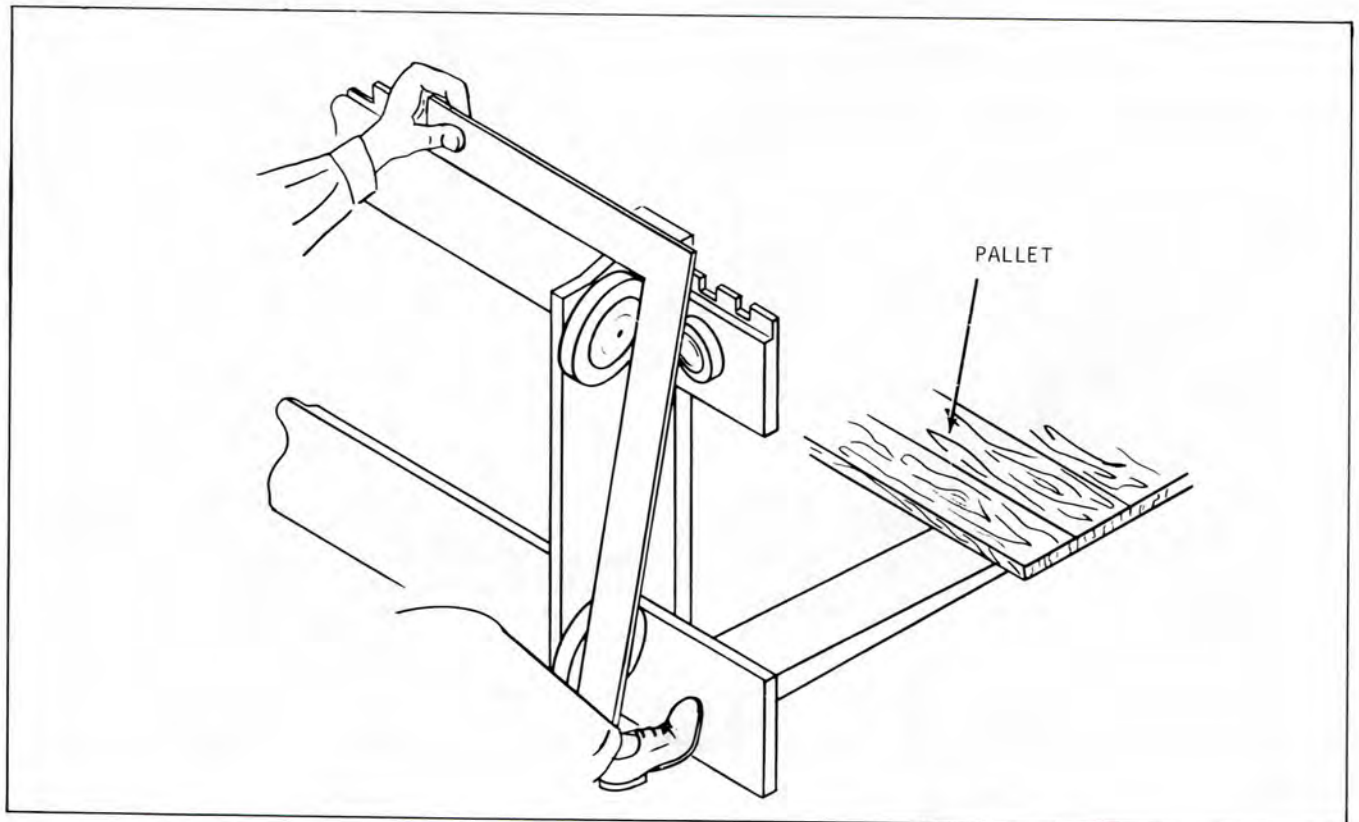


Plate 9573 Squaring Carriage Rollers (Four Roller Carriage)

Step 5. Square carriage rollers by placing carpenters square at the outer most camber of the ...

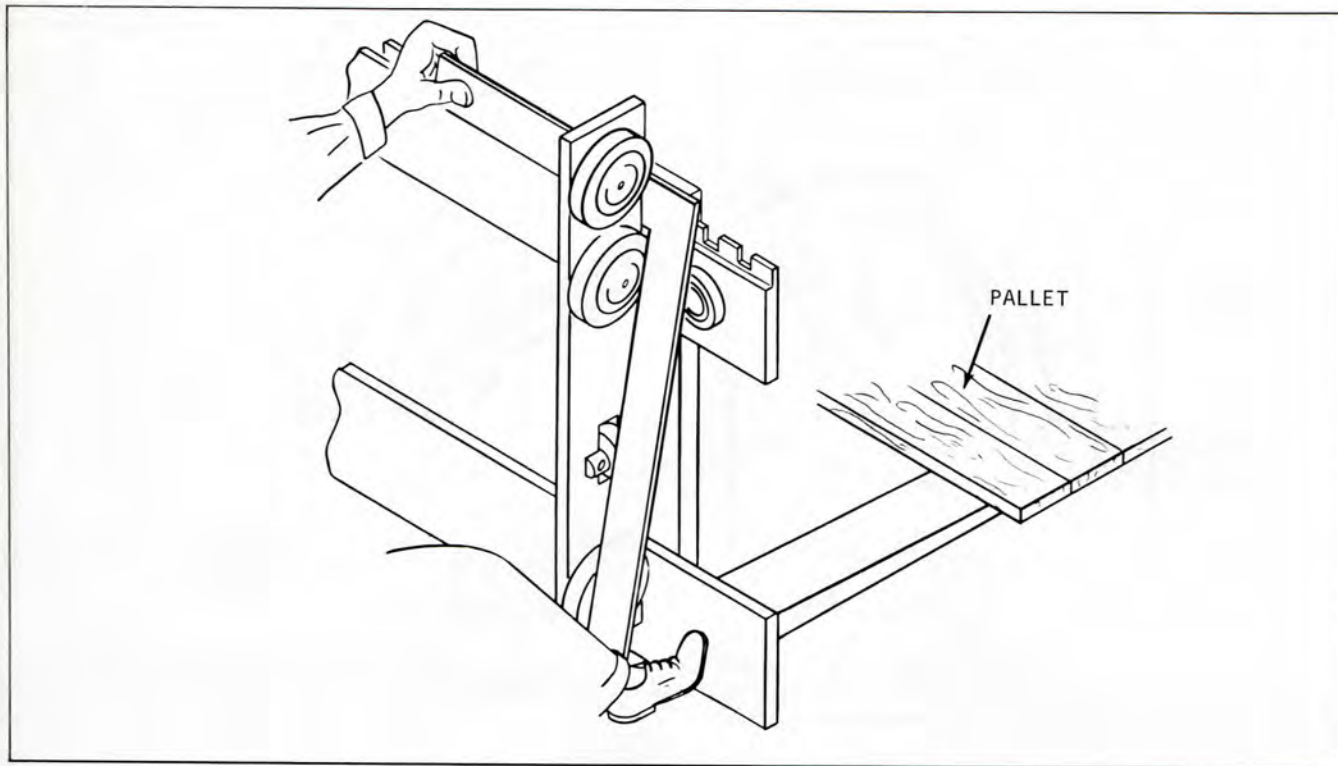
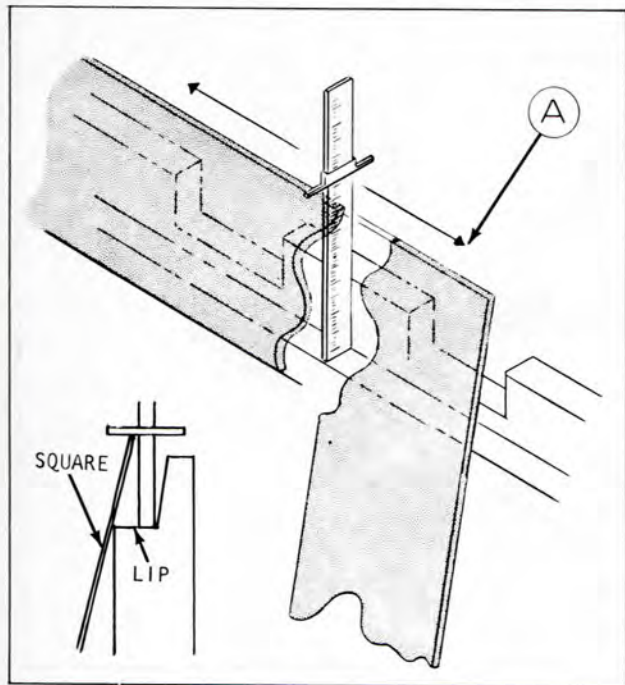


Plate 9574 Squaring Carriage Rollers (Six Roller Carriage)

... upper and lower rollers. Hold square in place with ankle and hand as shown.



Step 6. Hold square and measure the distance between the top face (or lip) of the upper fork bar to the edge of the square at Point A. Now take a measurement at opposite end of square ... these measurements should be the same. If they are not, add or remove shims on lower roller shaft until distance measured at each end is equal.

Plate 9575 Measuring For Squareness



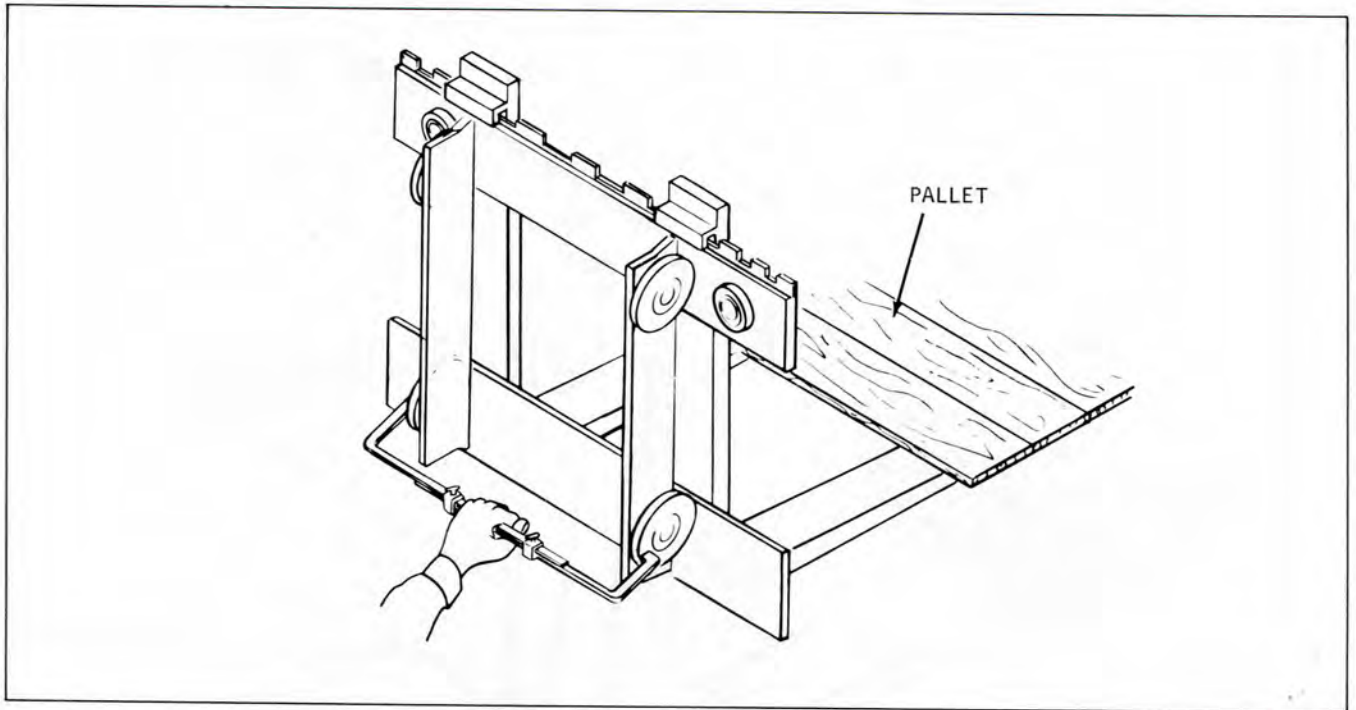


Plate 9576 Spanning Lower Rollers (Four Roller Carriage)

Step 7. Span lower rollers. Add or subtract shims to (the roller that has not been squared) ...

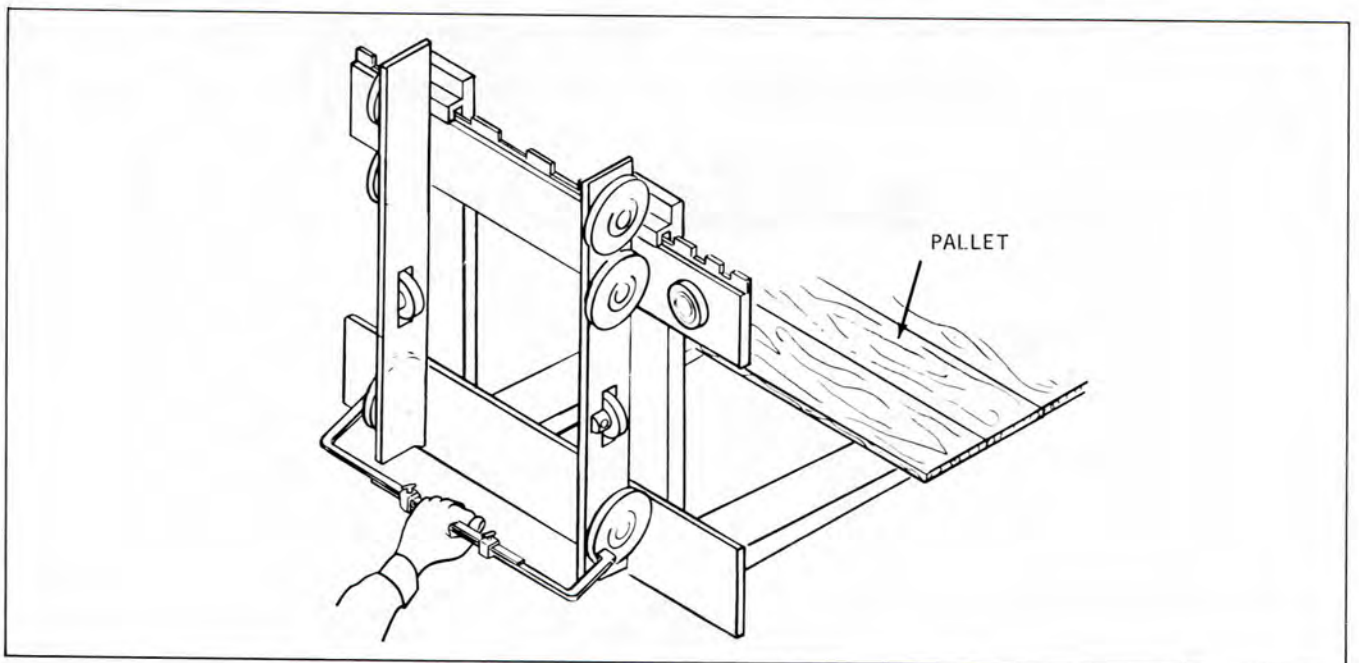


Plate 9577 Spanning Lower Rollers (Six Roller Carriage)

... reach the size of the outside spanning tool.

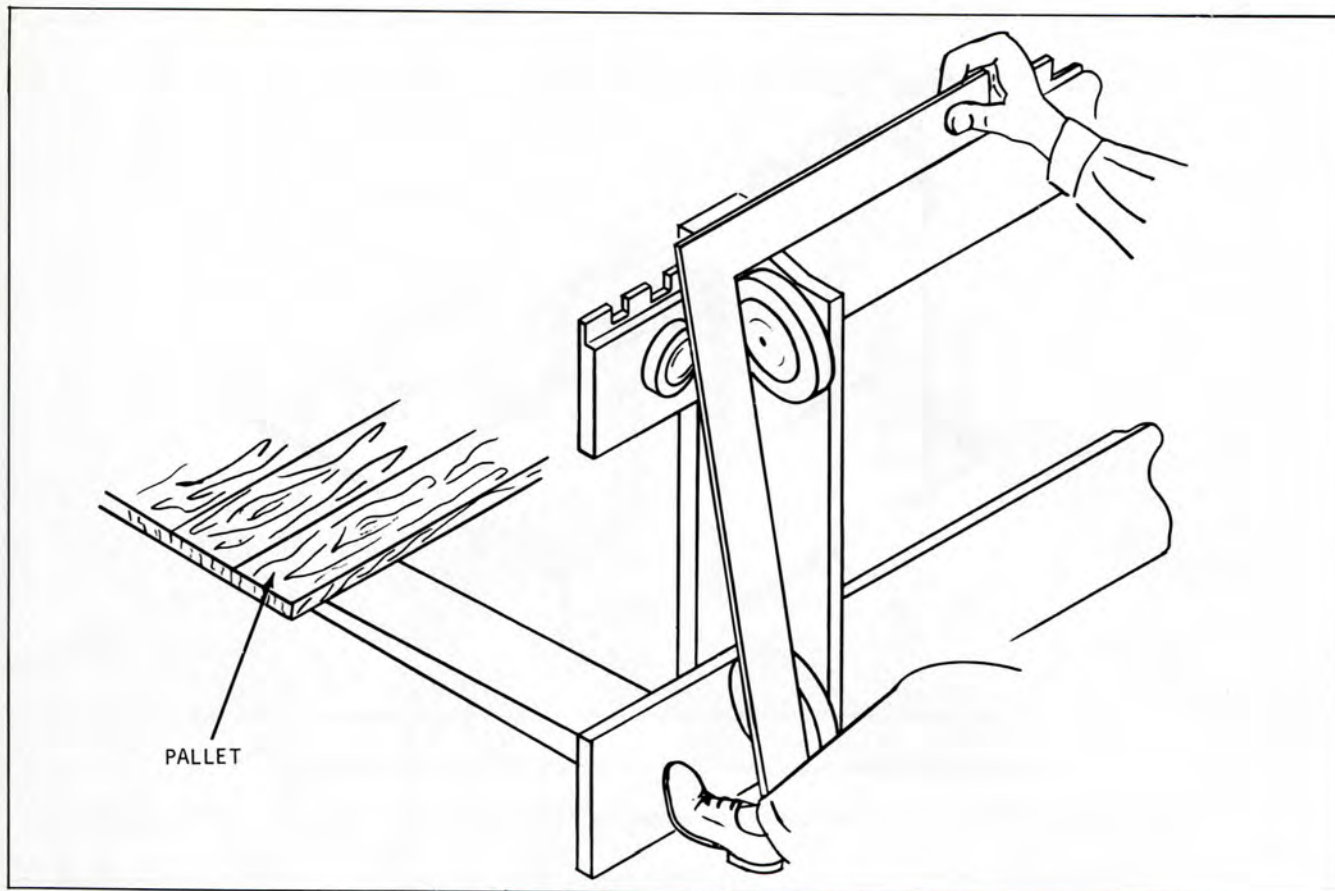


Plate 9578 Checking Squareness (Four Roller Carriage)

Step 8. Check opposite side for squareness (by holding square in the same manner as before and checking ...

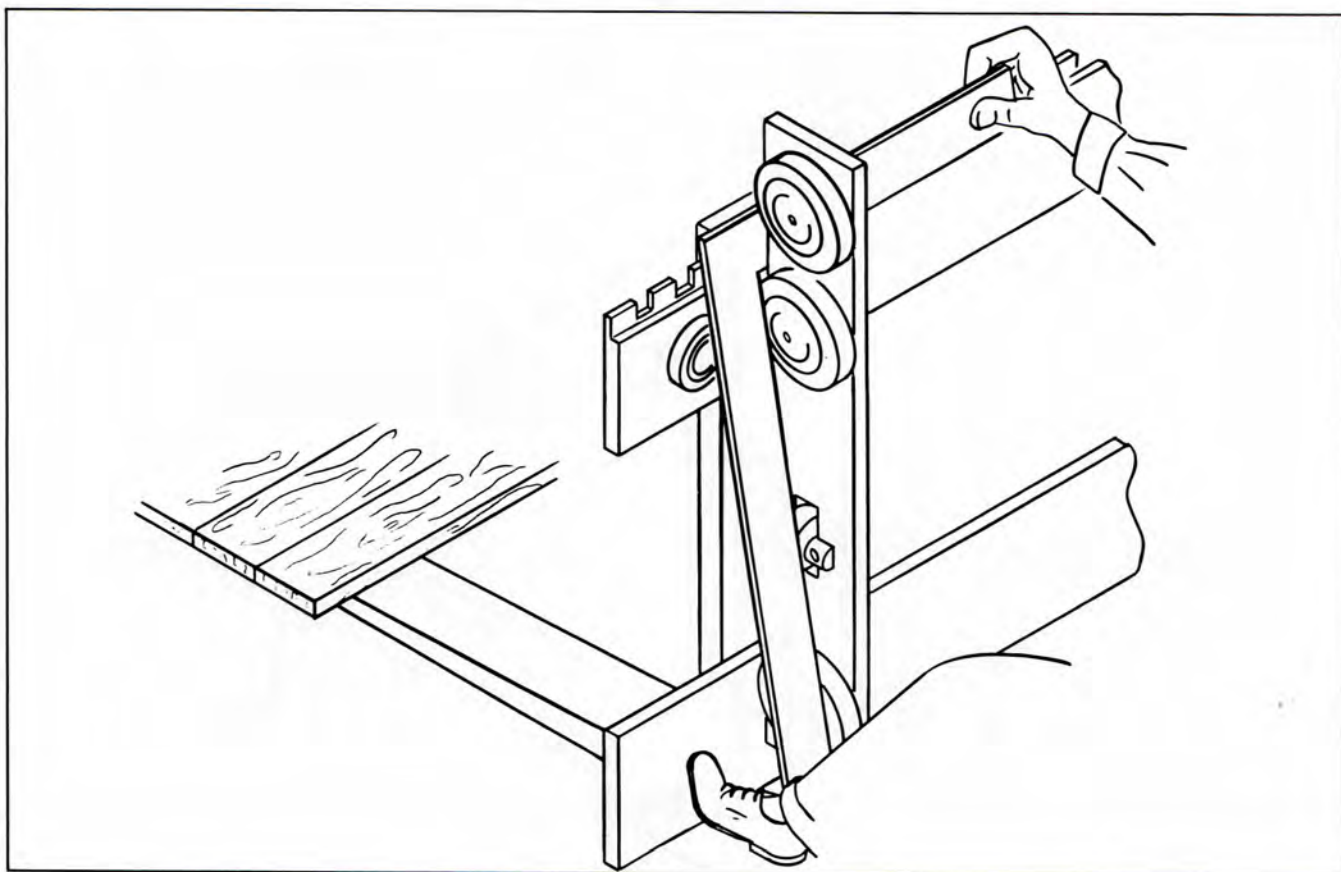


Plate 9579 Checking Squareness (Six Roller Carriage)

... measurement). This side will be square within  $1/32$ " ; if not, return to Step 5. and repeat procedure.

SIX ROLLER CARRIAGE ONLY

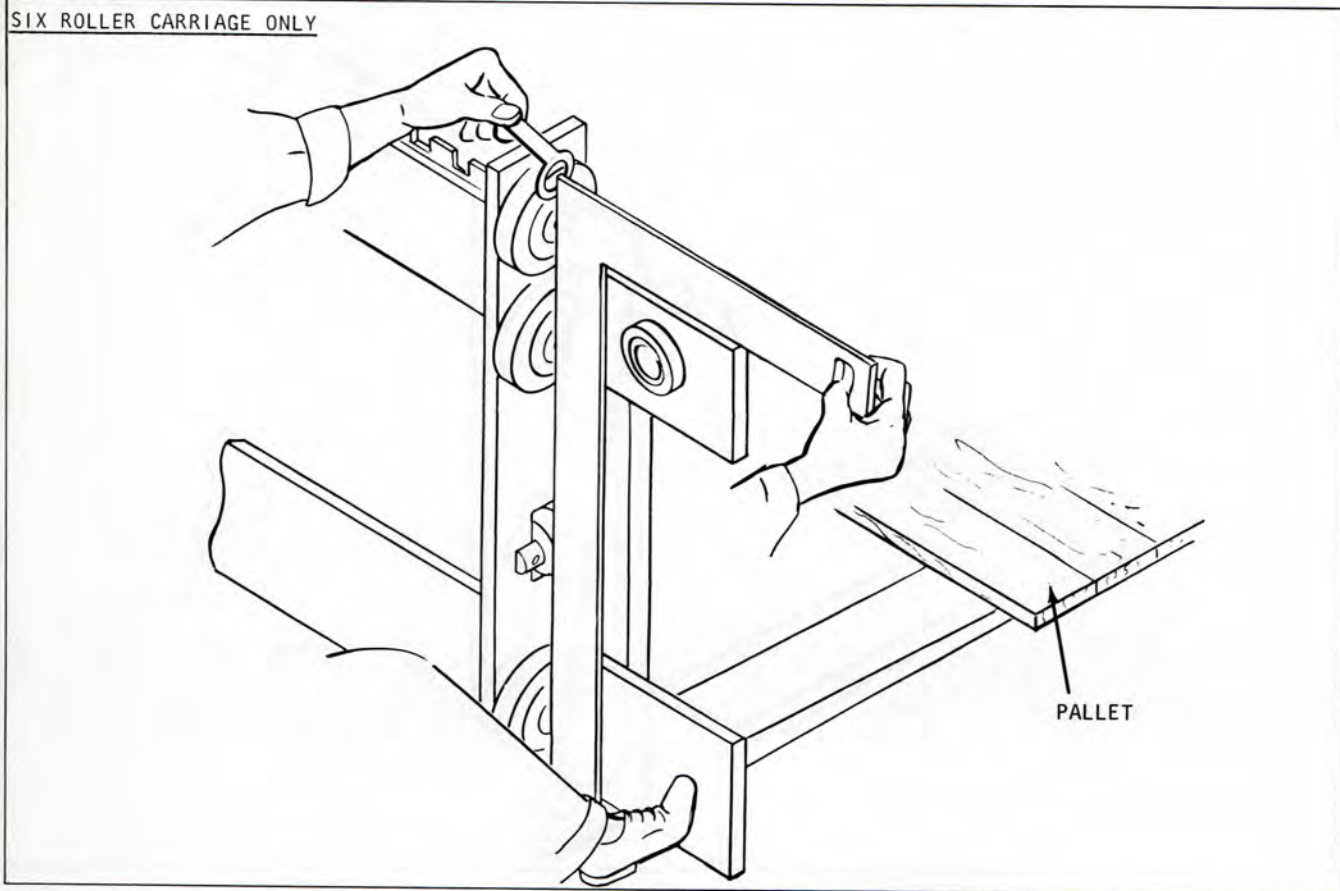


Plate 9580 Top Roller Clearance

Step 1. Place square on the vertical center line of the carriage rollers, as shown above. There must be some clearance between the square and the side surface of the top roller. This clearance should not exceed 1/32" or one shim

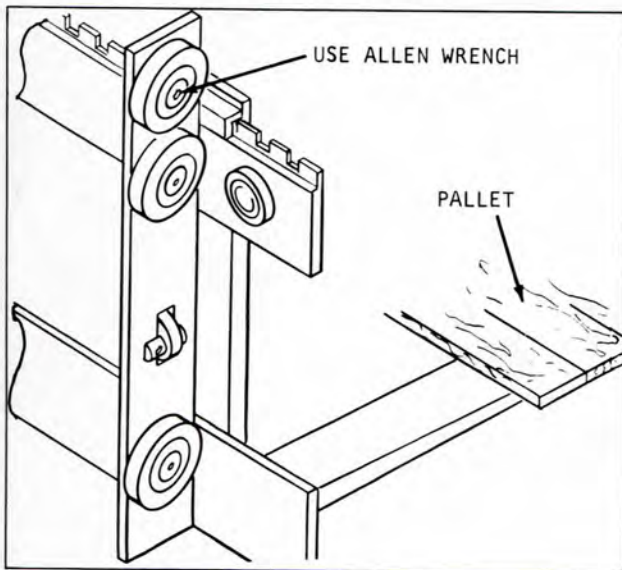


Plate 9581 Removing Top Roller

Step 2. If adjustment is necessary, remove allen screw, lock washer and flat washer to add or remove shims on shaft. Tighten screw securely after completing adjustment.

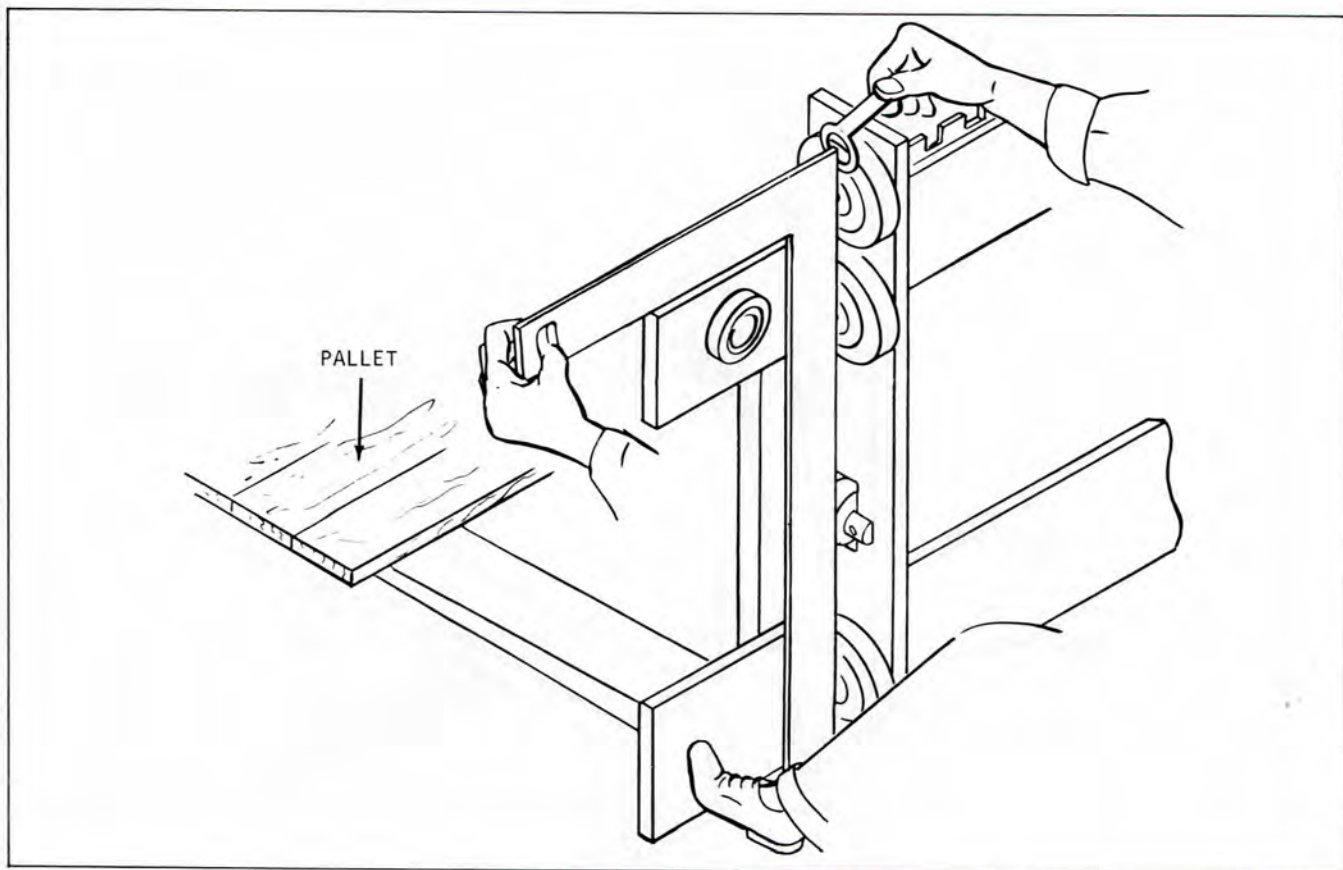


Plate 9582 Top Roller Clearance

Step 3. Check opposite upper roller in the same manner; adjust if necessary.

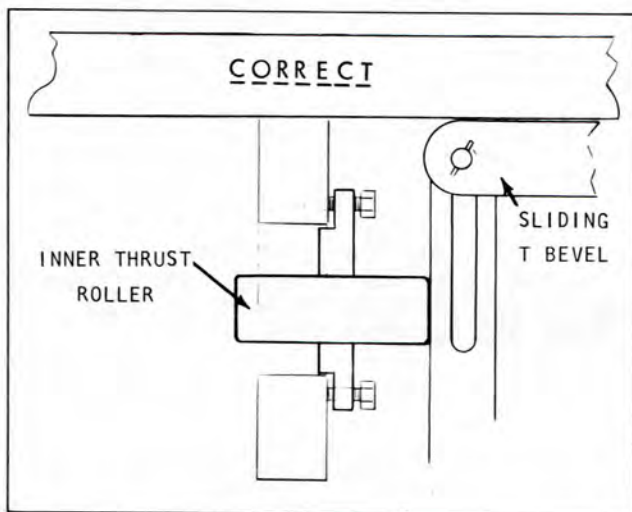


Plate 9583 Checking Squareness ■ CORRECT

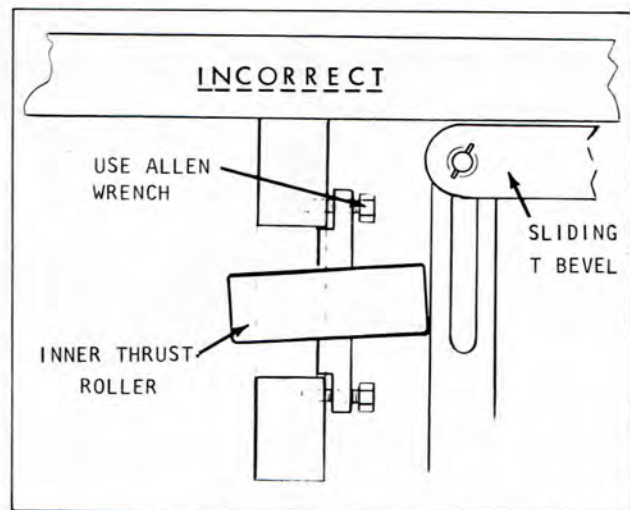


Plate 9584 Checking Squareness ■ INCORRECT

Step 4. Check squareness of inner thrust rollers with Sliding T Bevel. Set Sliding T Bevel to 90° using carpenter's square.

Step 5. Add or subtract shims for adjustment (Use allen wrench see Plate 9584).

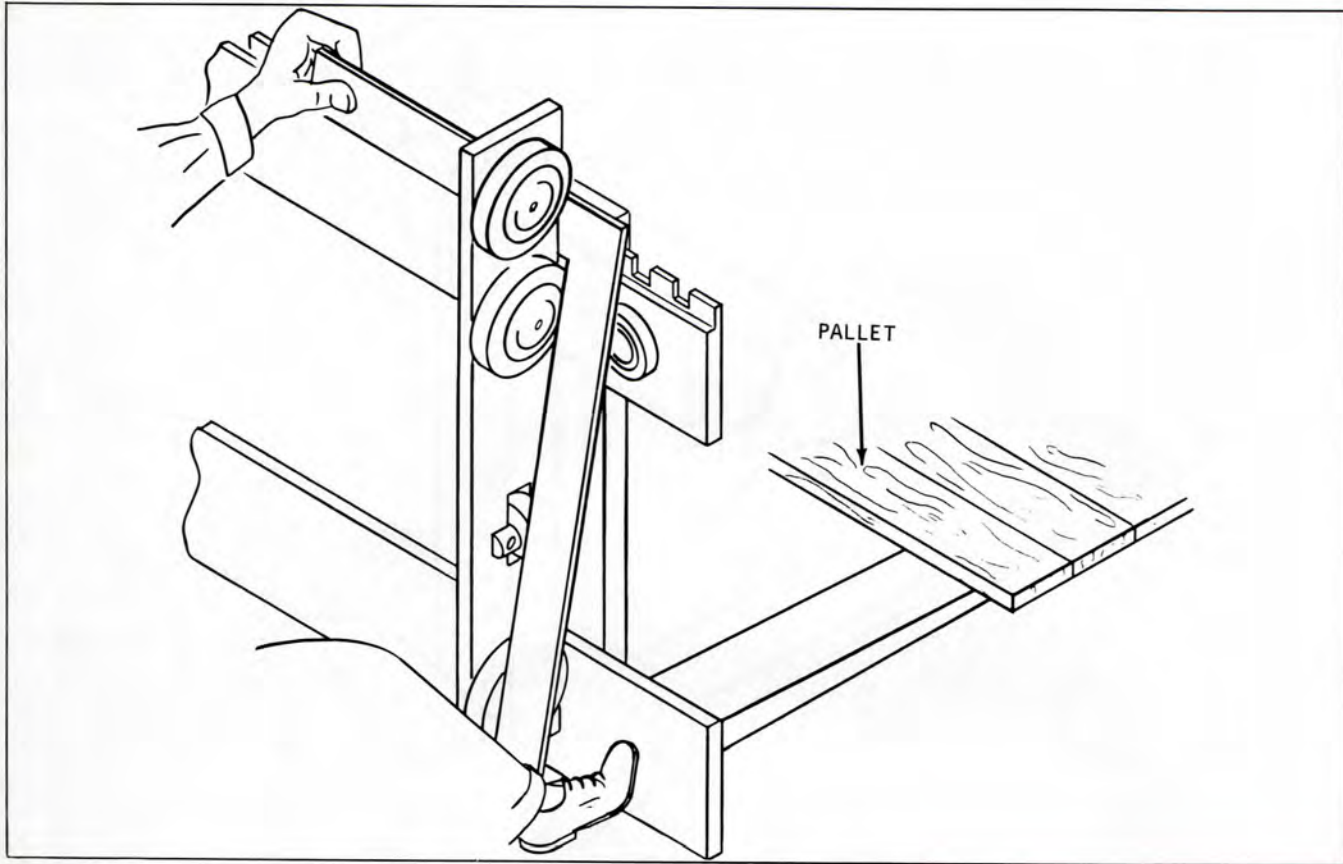


Plate 9574 Square And Side Thrust Roller

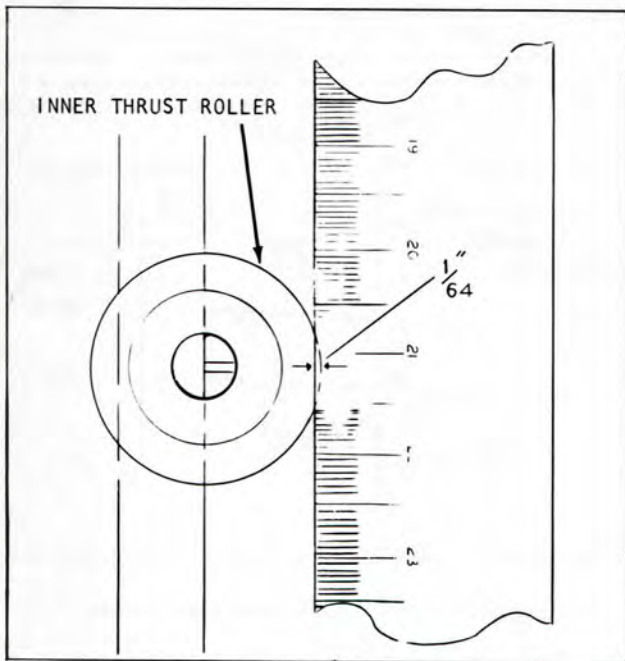


Plate 9585 Reading Roller Projection

Step 6. The inner thrust roller is to project 1/64" past line of square. Use one thrust roller shim and eyeball distance as shown (Plate 9573 and Plate 9585).

Step 7. Repeat Step 6. on opposite side.

C. CARRIAGE INSTALLATION

## NOTE

Before installing carriage, check upright for proper shimming adjustment.

Step 1. Drive machine up to carriage and position upright to match tilt of carriage.

Step 2. Raise inner rails to just clear upper carriage rollers.

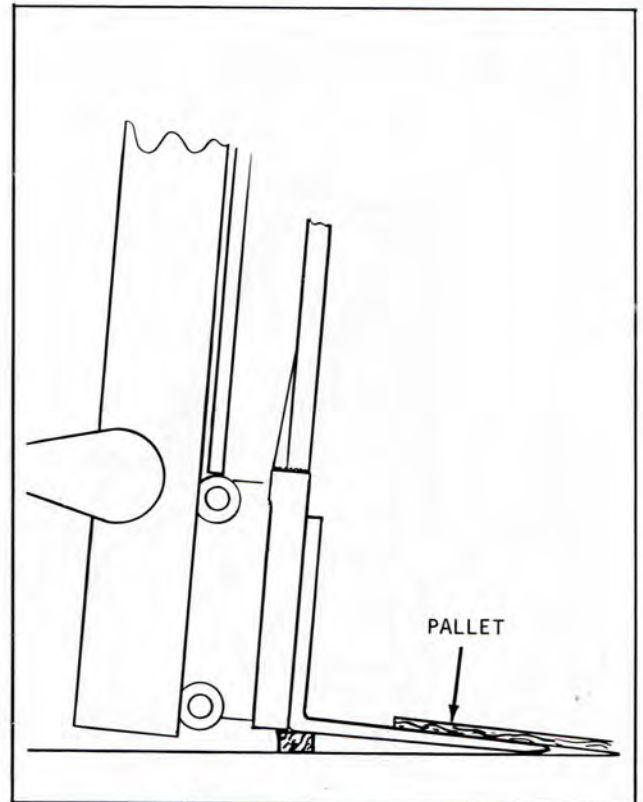


Plate 9565 Inner Rail Clearing Carriage Rollers

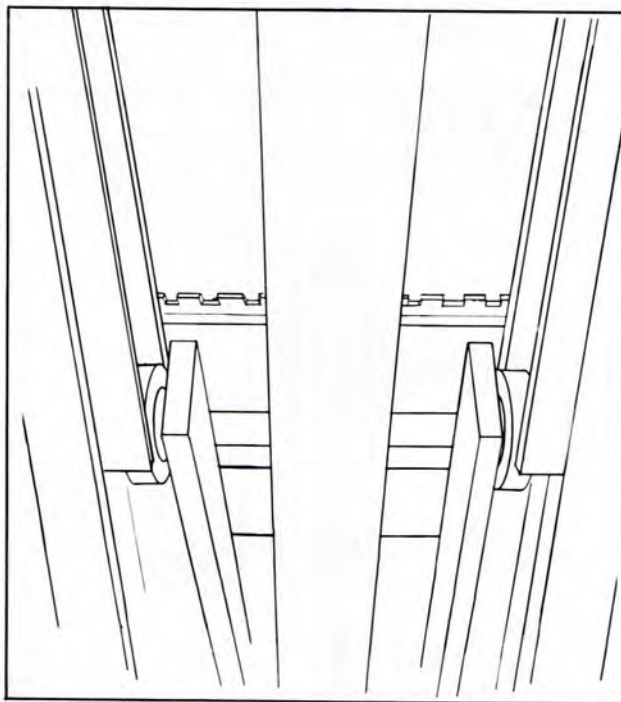


Plate 9591 Rollers Guiding Into Inner Rail

Step 3. Continue to drive machine forward until inner rails line up with upper carriage rollers, then... slowly lower inner rails to full down position.

CAUTION

CHECK TO BE SURE THE TOP CARRIAGE ROLLERS ARE GUIDING INTO INNER RAIL.

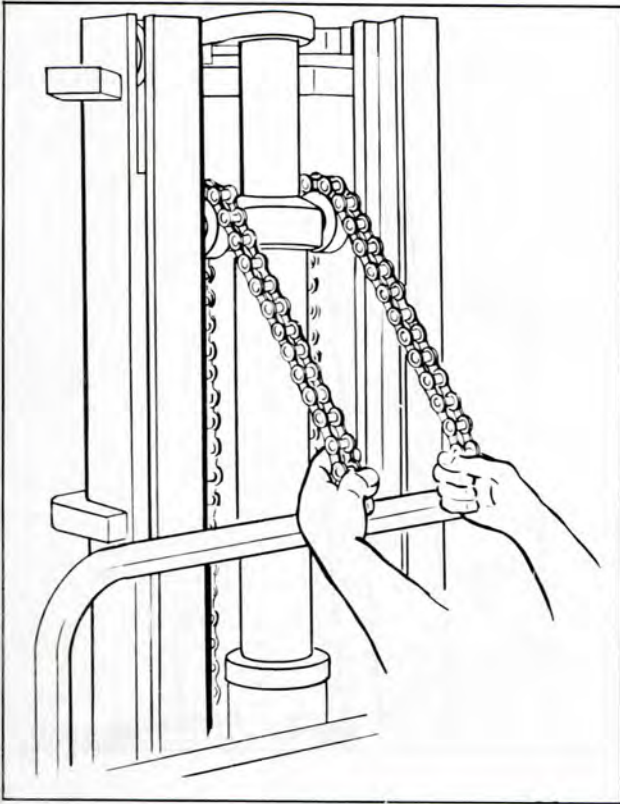


Plate 9586 Pulling Piston Head Down

Step 3(a). Remove wires holding lift chains.

(b). With a chain in each hand and someone holding the lift cylinder lever down, pull the piston to full down position. Place chains behind carriage.

Step 5. Raise carriage about 5' and place a 3' to 4' long 4"x4" wooden beam under it. DO NOT stand directly under forks. Lower carriage onto beam.

Step 6. Replace bolts with anchor pins.

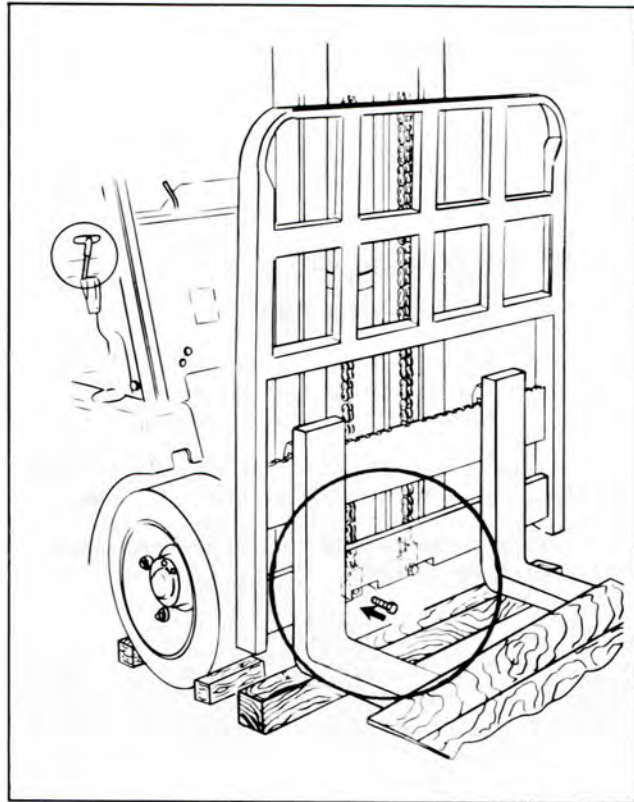


Plate 9587 Installing Bolts

Step 4. Put chain anchors in carriage anchor brackets and install 3/8" x 2" bolts in anchor pin holes.

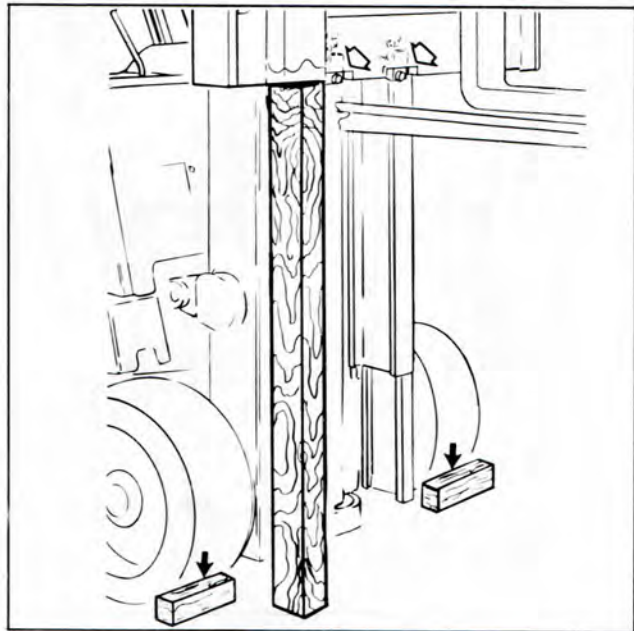


Plate 9593 Carriage Pin Replacement



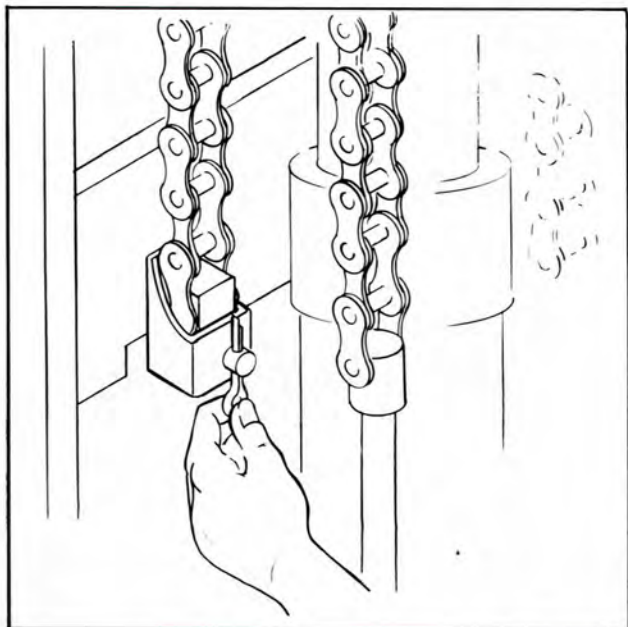
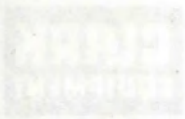


Plate 9588 Installing Cotter Pins

Step 7. Replace cotter pins in anchor pins.

Step 8. Raise and lower carriage to full positions checking all phases of operation.



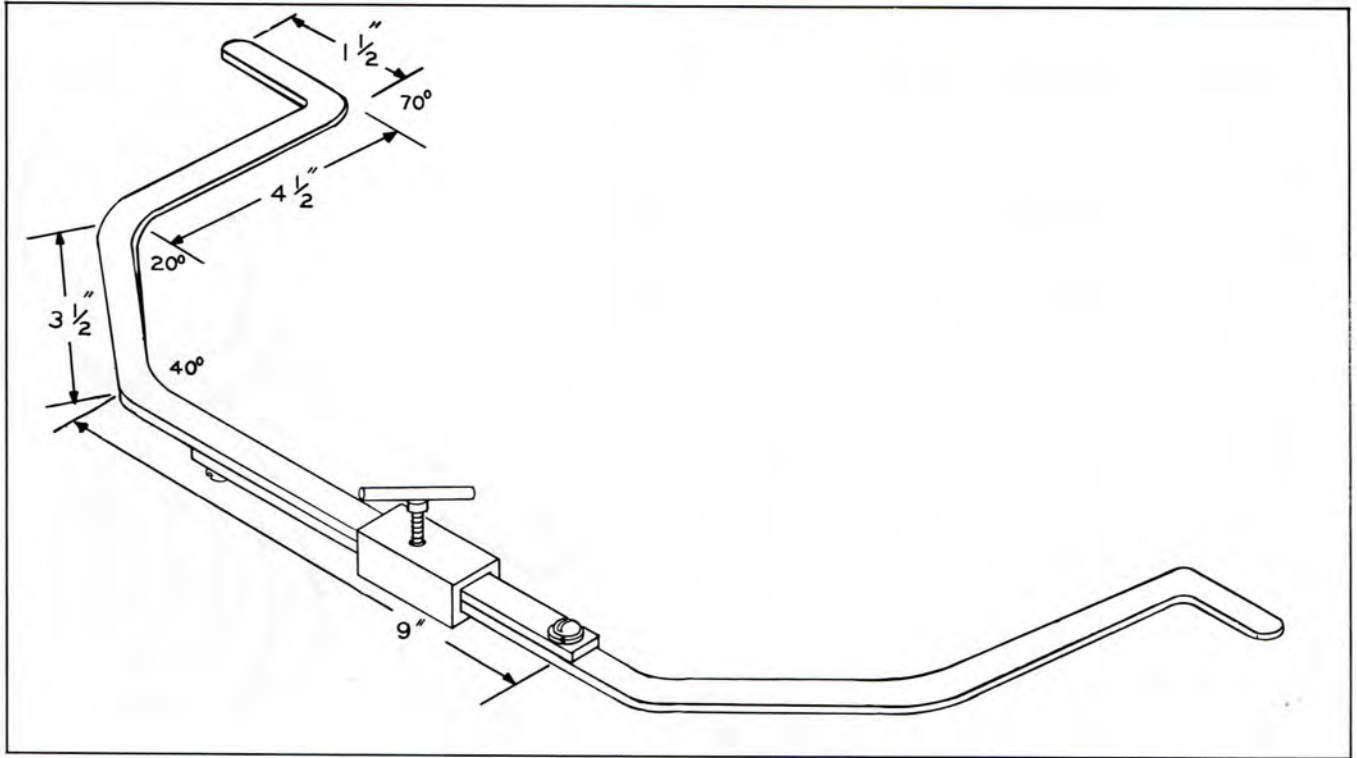
# INDUSTRIAL TRUCK DIVISION



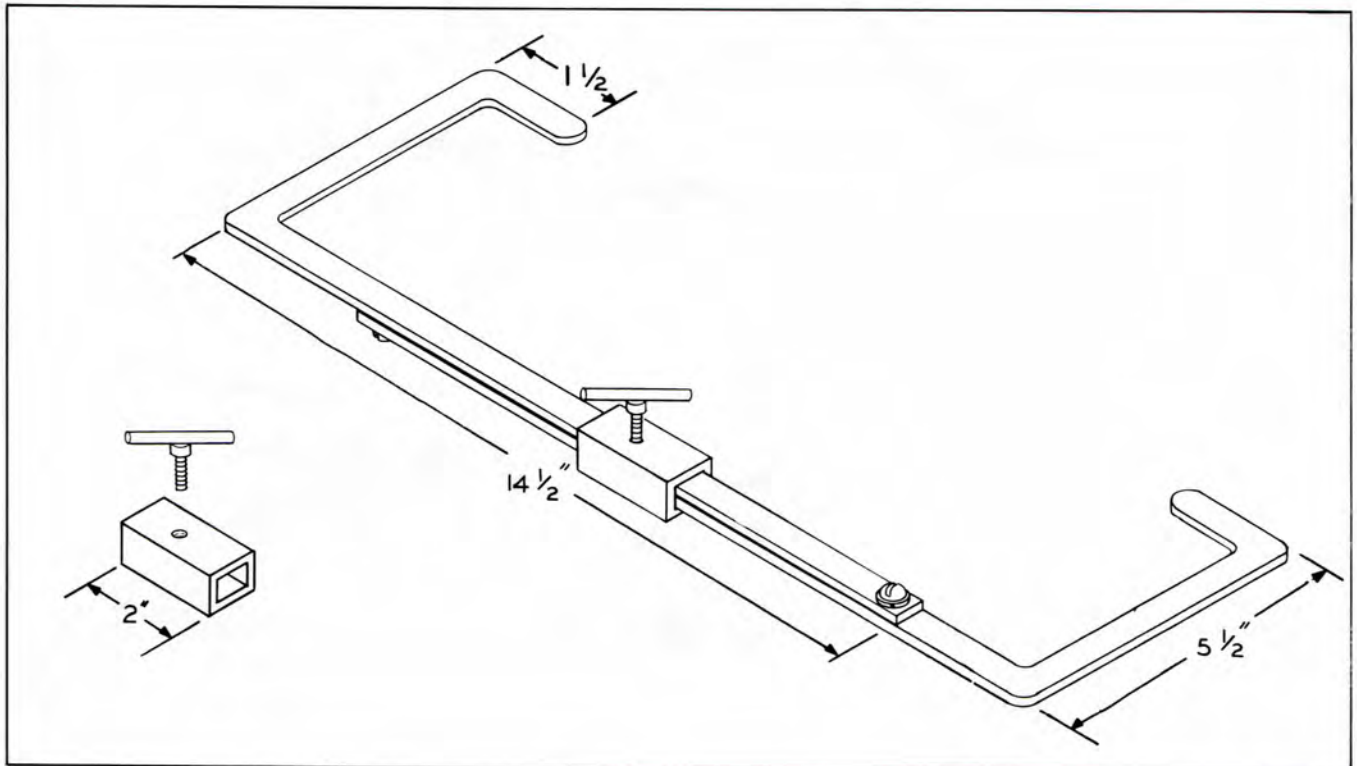
DEPARTMENT OF INDUSTRIAL ENGINEERING



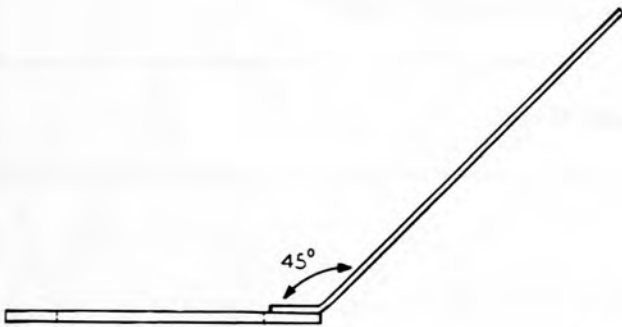
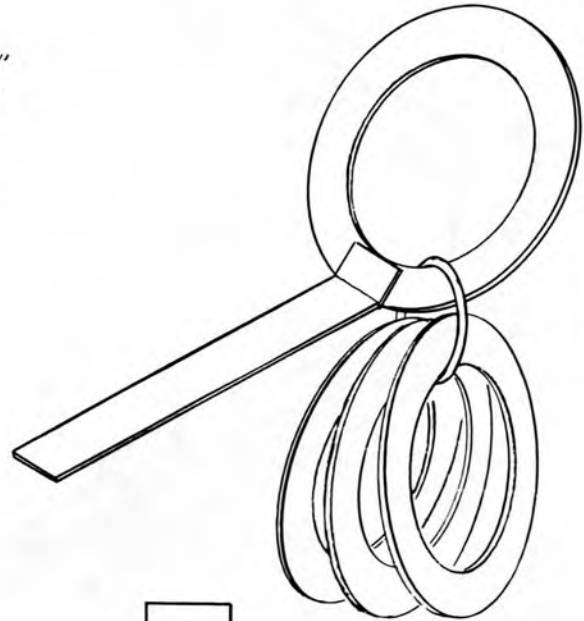
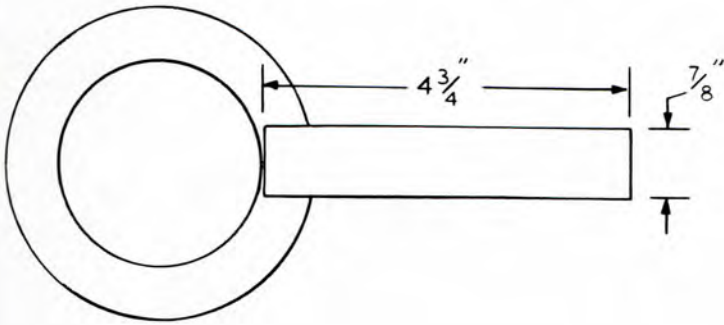
The following information is for your  
reference only. It is not intended to be  
used as a substitute for the actual  
instructions for the machine.



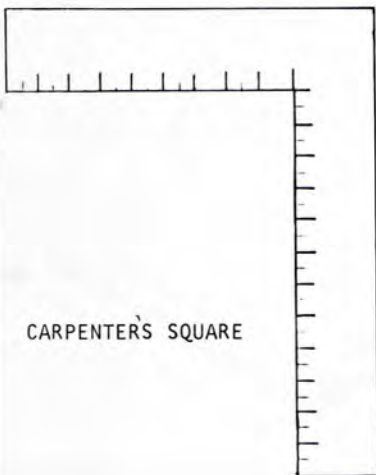
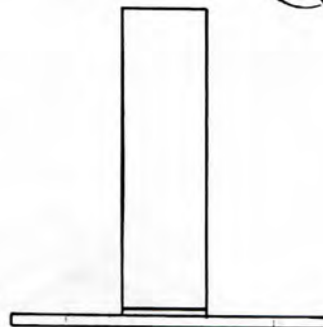
INSIDE SPANNING TOOL



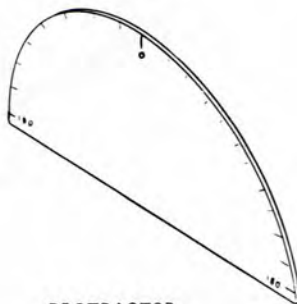
OUTSIDE SPANNING TOOL



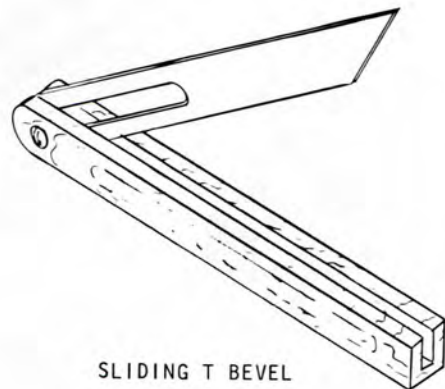
SHIM GAUGE



CARPENTER'S SQUARE



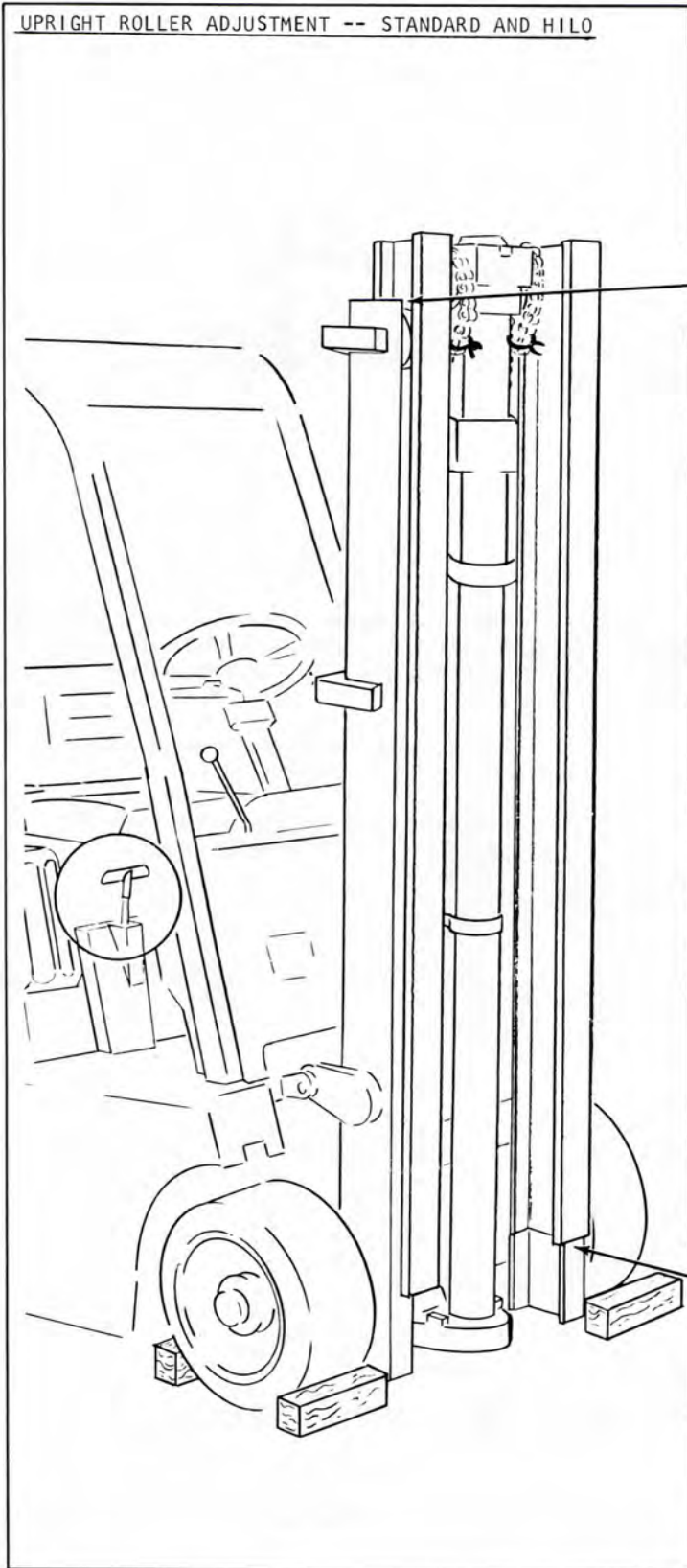
PROTRACTOR



SLIDING T BEVEL

UPRIGHT ROLLER ADJUSTMENT

UPRIGHT ROLLER ADJUSTMENT -- STANDARD AND HILO

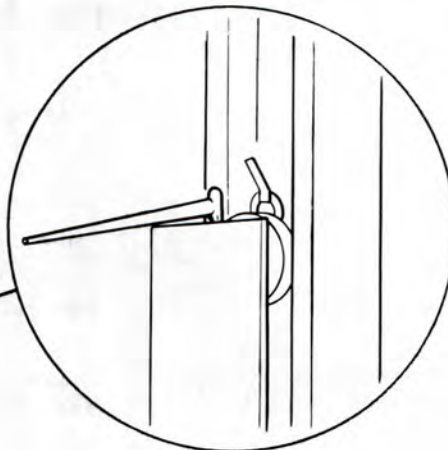
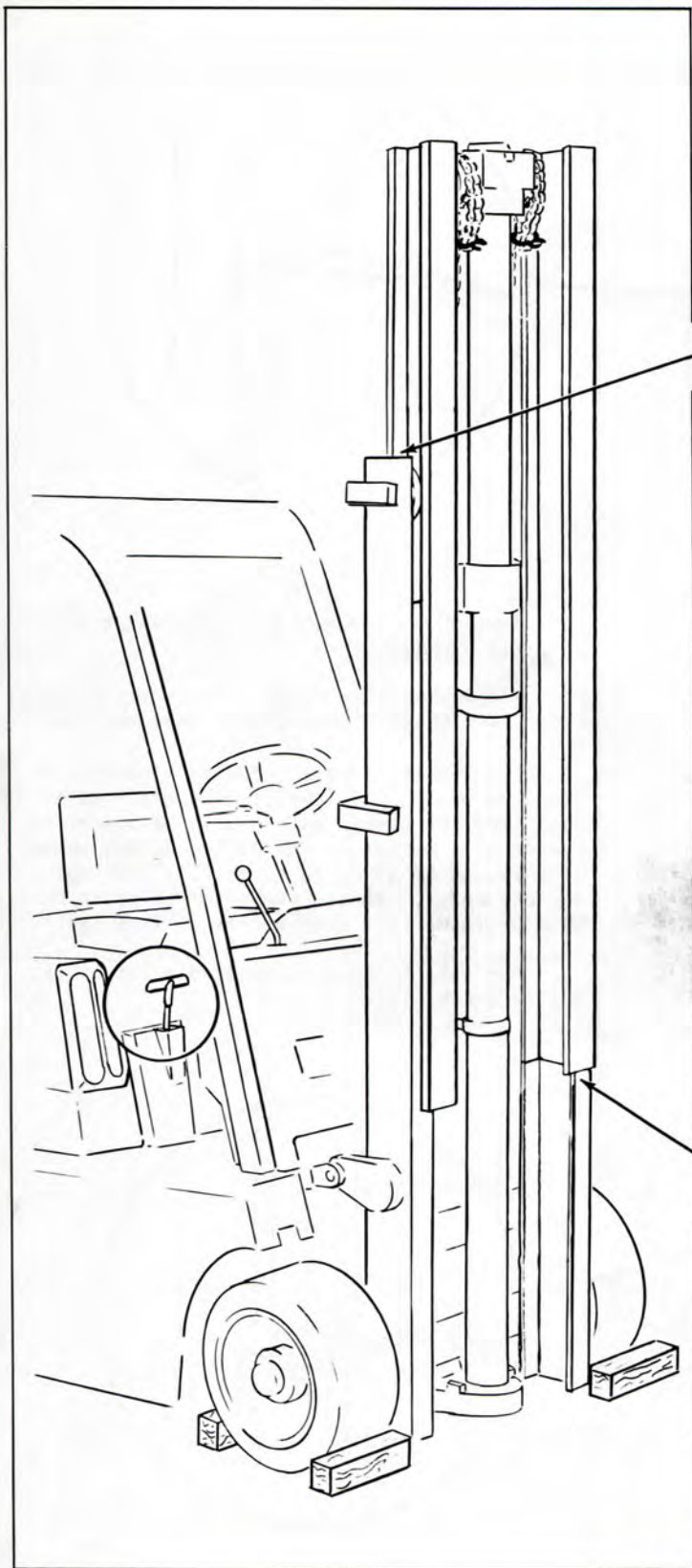


Step 1(a). Remove carriage. Refer to CARRIAGE REMOVAL.

Before checking roller clearance, position inner rail about 5" above full down position.

Check both sides for roller clearance at (top and bottom) of inner rail. Use tool to determine the number of shims to be added and record this number on the rail. Record number of shims to be used, on outer rail (for top rollers only). Record number of shims to be used on inner rail (for bottom rollers only).

There is to be some clearance but it is not to exceed 1/32".



Step 1(b). Raise inner rail to 1/2 of its full up position. With tool and bar, check the roller clearance in the same manner as before.

Record number of shims to be used, on outer rail (for top rollers only).

Record number of shims to be used on inner rail (for bottom rollers only).

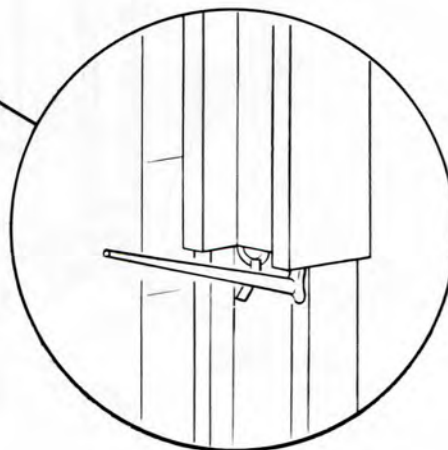
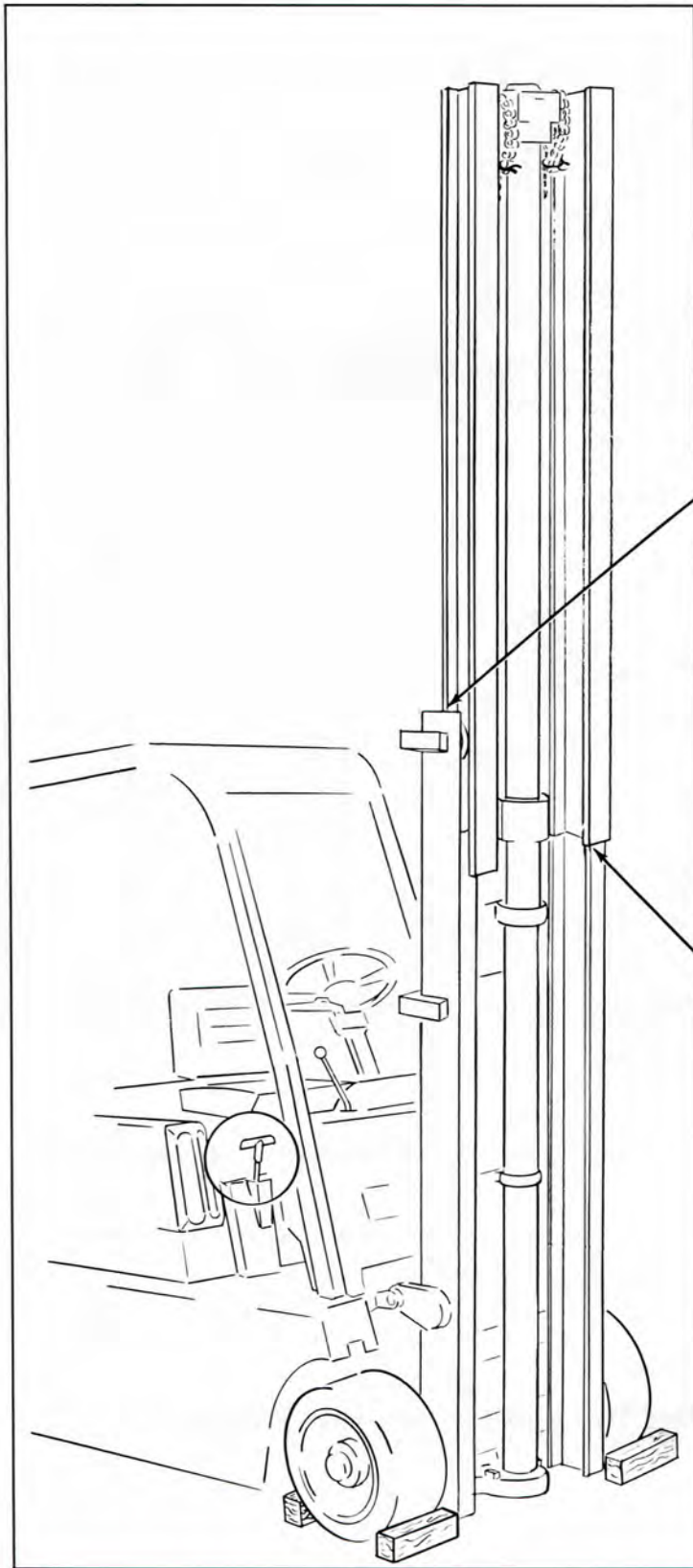


Plate 9625



Step 1(c). Raise inner rail to full up position and with tool and bar, check for roller clearance in the manner as before.

Record number of shims to be used, on outer rail (for top rollers only).

Record number of shims to be used, on inner rail (for bottom rollers only).

Plate 9626

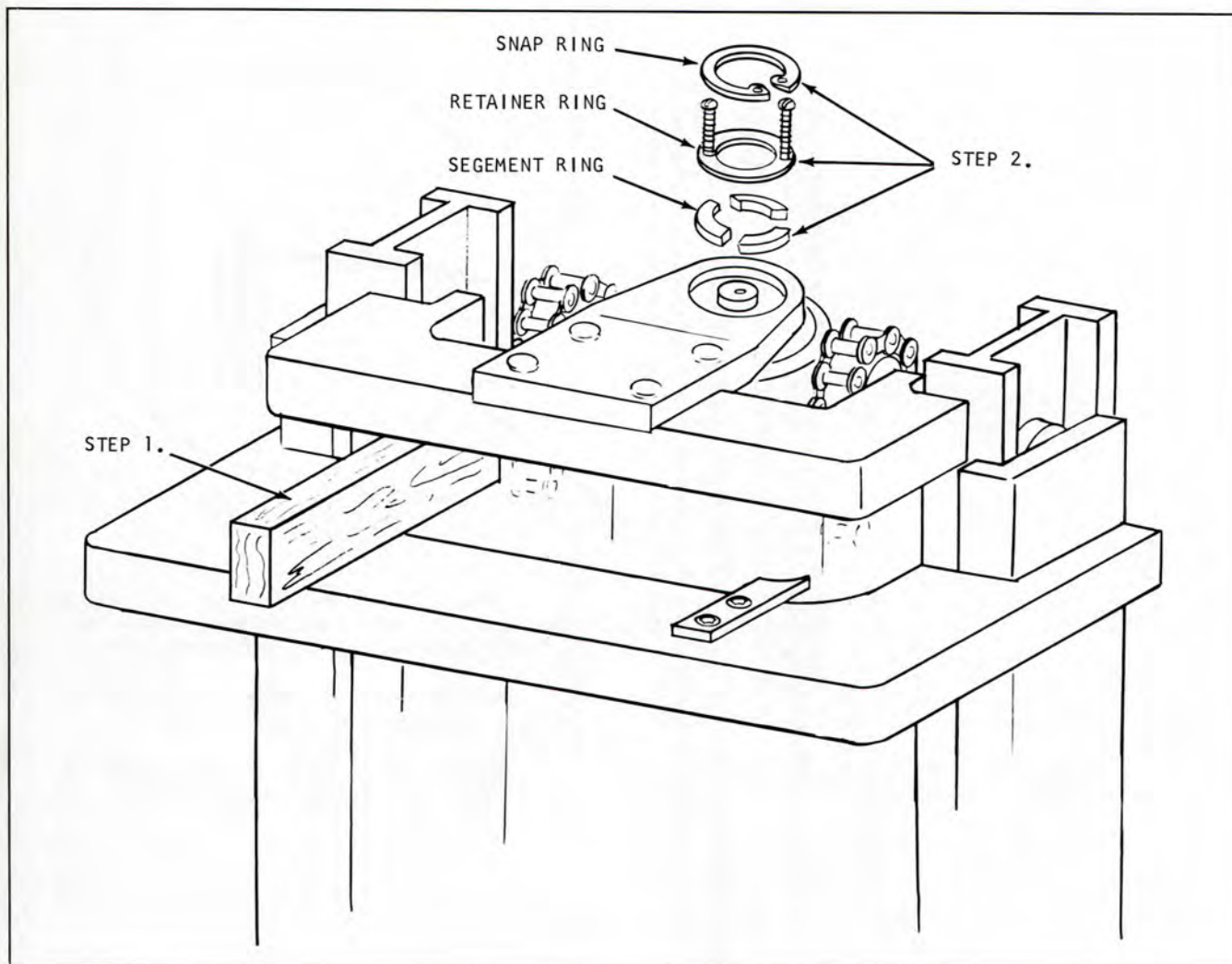


Plate 9627

REMOVAL OF INNER RAIL

Step 1. Raise inner rail about 5 inches and place a 2" x 4" block between upper tie bars. Lower inner rail until block supports it.

The upright you are working with may have a different piston anchor than the one shown above, remove it accordingly.

Step 2(a). Secure piston head with chain hoist.

(b). Remove lift cylinder from upper anchor

1. Remove snap ring

2. Place two (2) #6-32X2" round head slotted machine screws (in holes provided) in retainer ring.

(c). Remove segment ring.



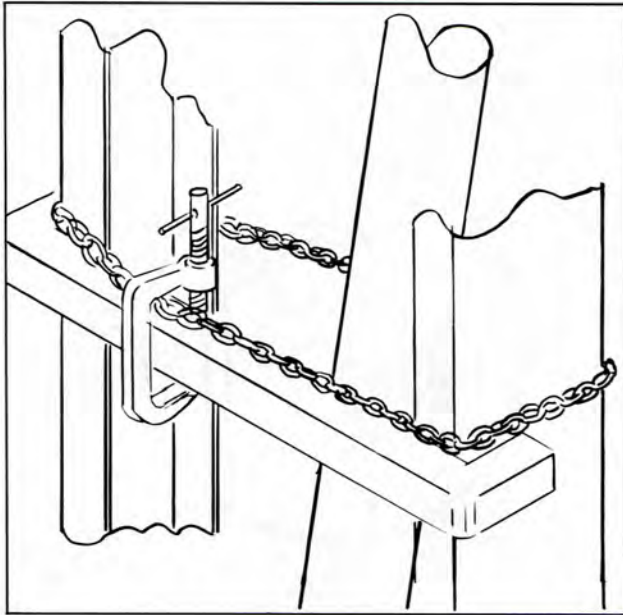


Plate 9628

Step 3. Place a safety strap or chain around outer rail as shown.

Step 4. Lower piston head out of anchor using pry bar. With the upright tilted forward the piston will rest on the strap or chain.

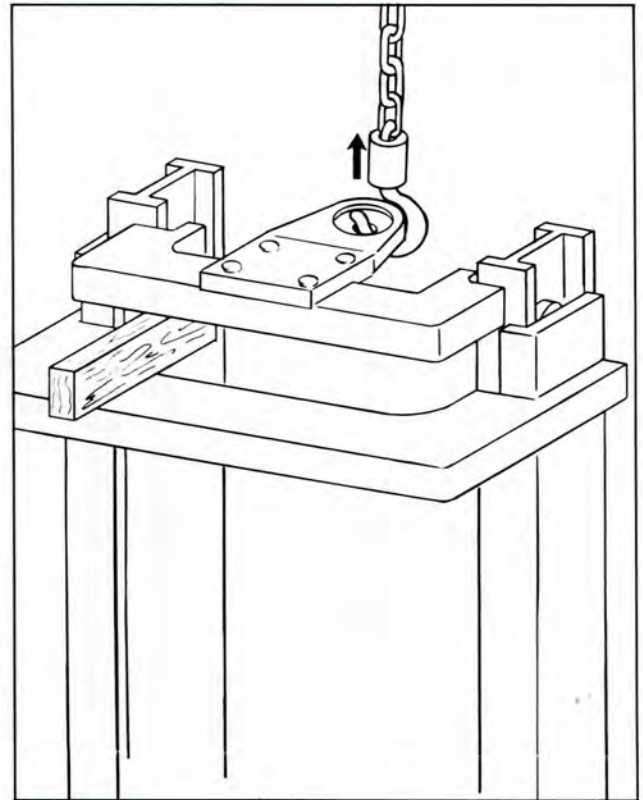


Plate 9630

Step 6. Place lifting device hook in hole of cylinder anchor. Raise about 2" and remove block between tie bars.

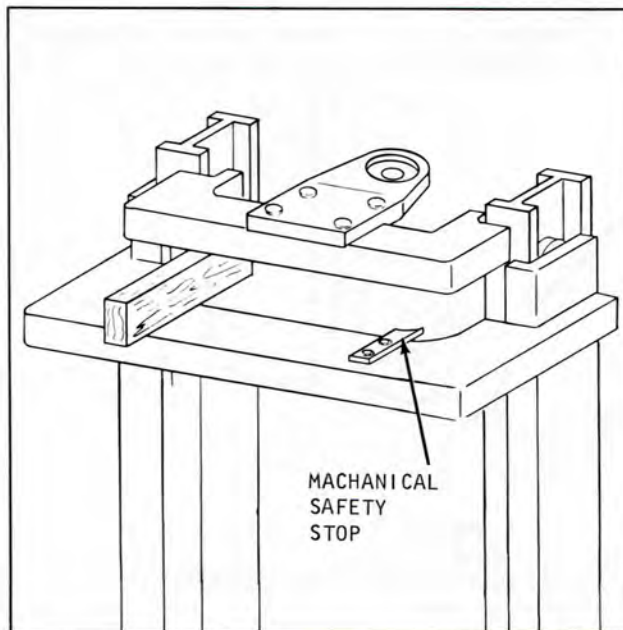
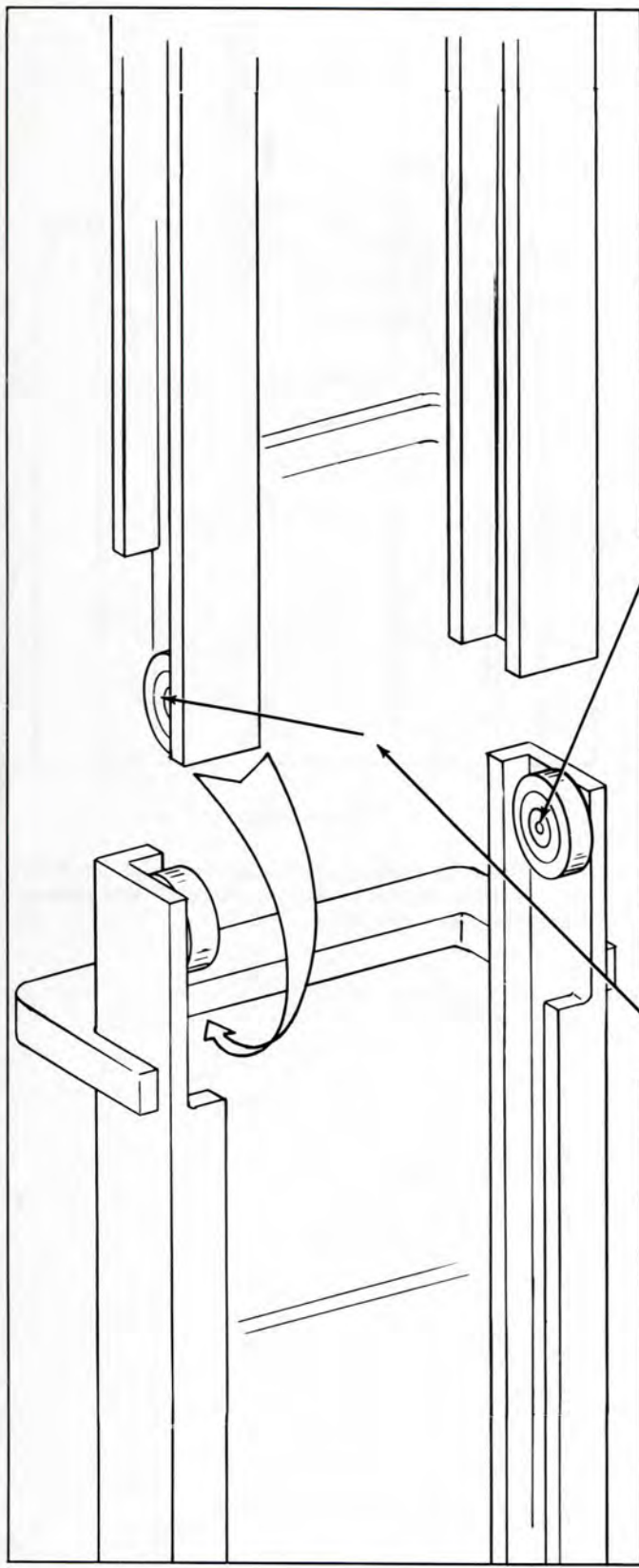


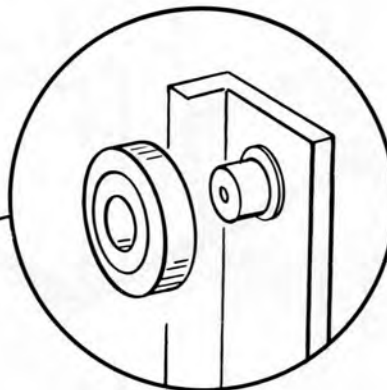
Plate 9629

Step 5. Remove mechanical safety stops with allen wrench.



Step 7. Raise inner rail out of outer rail.

Step 8. Leave inner rail in this position while adjusting rollers.



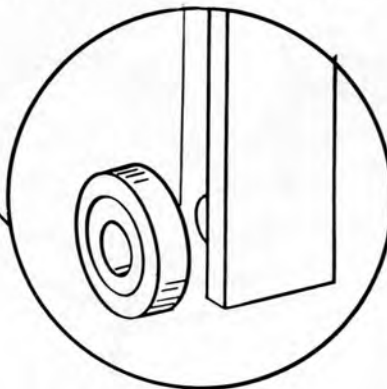
Step 9. Adjusting upright rollers:

A. Outer rail rollers.

1. Count the number of shims at the right and left hand rollers.

2. Look at the three (3) numbers you recorded on the outer rail in Step 1. The smallest of these numbers is the total number of shims to be added. A "0" means DO NOT add shims.

3. Your target for adjustment is to have the same number of shims at each upper roller. If you end up with an extra shim DO NOT remove it. Mark the side having an extra shim.



B. Inner rail rollers

1. Count the number of shims at the right and left hand rollers.

2. Look at the three (3) numbers you recorded on the inner rail in Step 1. Go through the same steps you followed in adjusting the upper rollers.

3. If you end up with an extra shim here too, be sure it is on the same side as the extra upper shim.

C. Replace inner rail.

Plate 9631

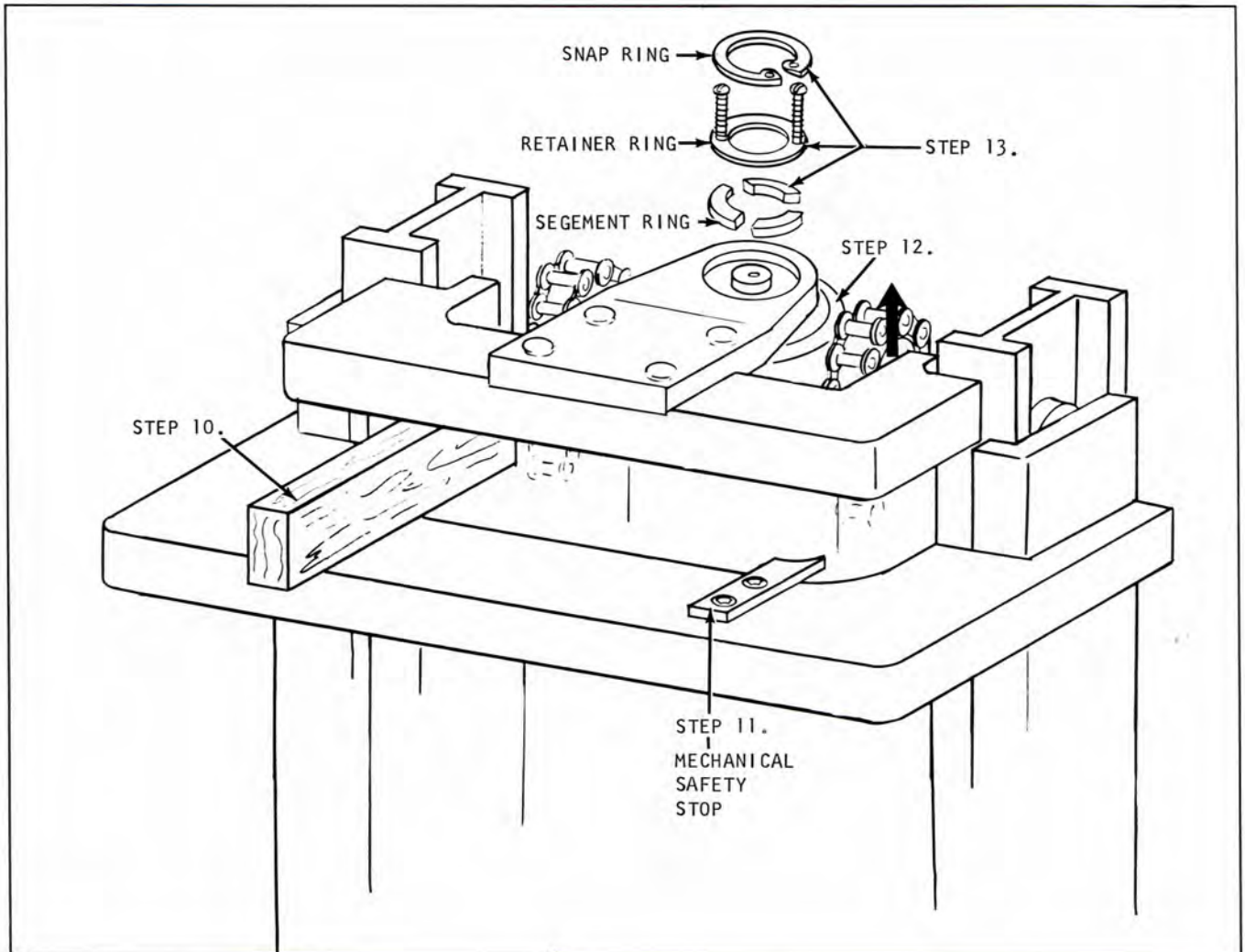
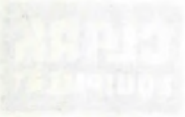
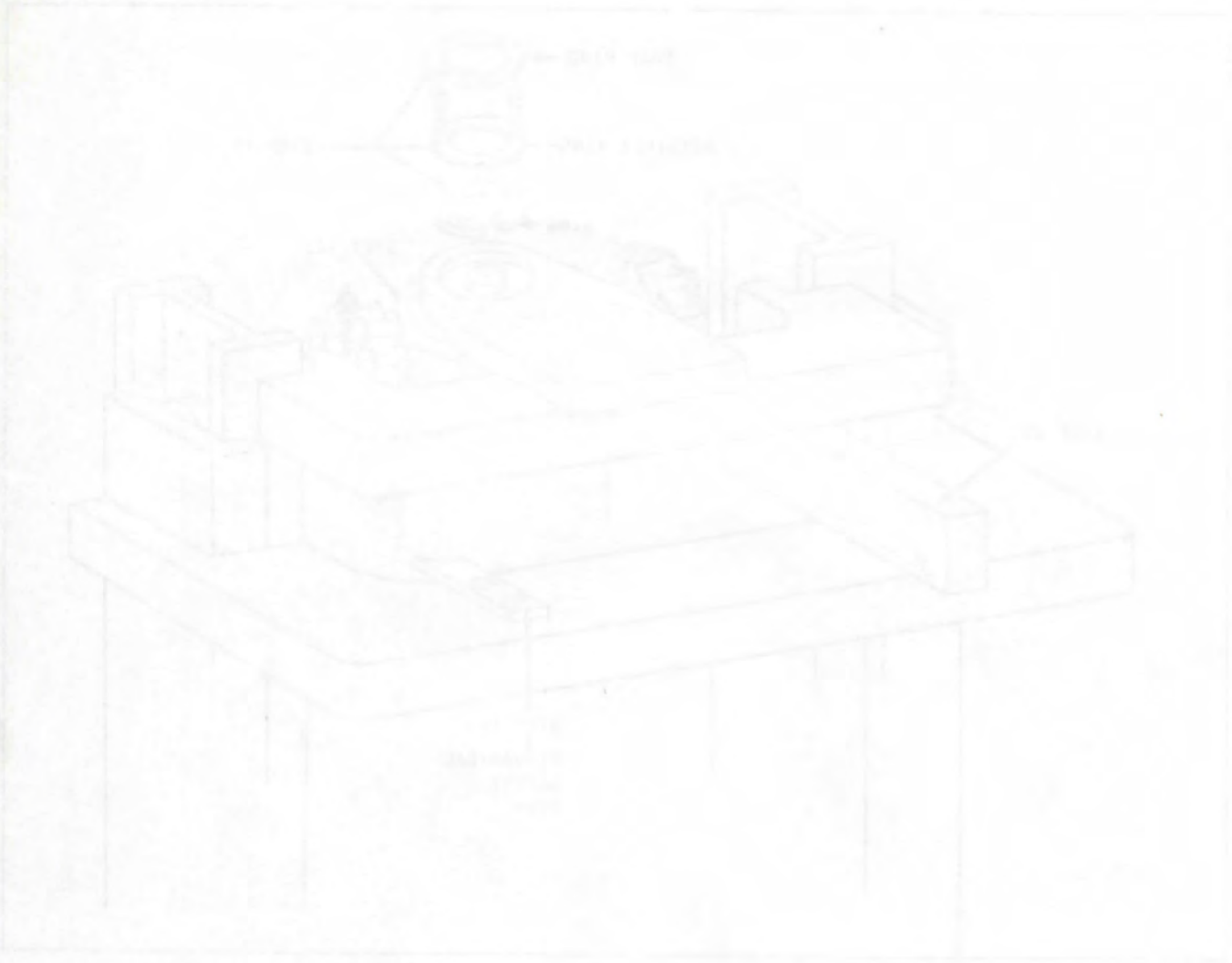


Plate 9632

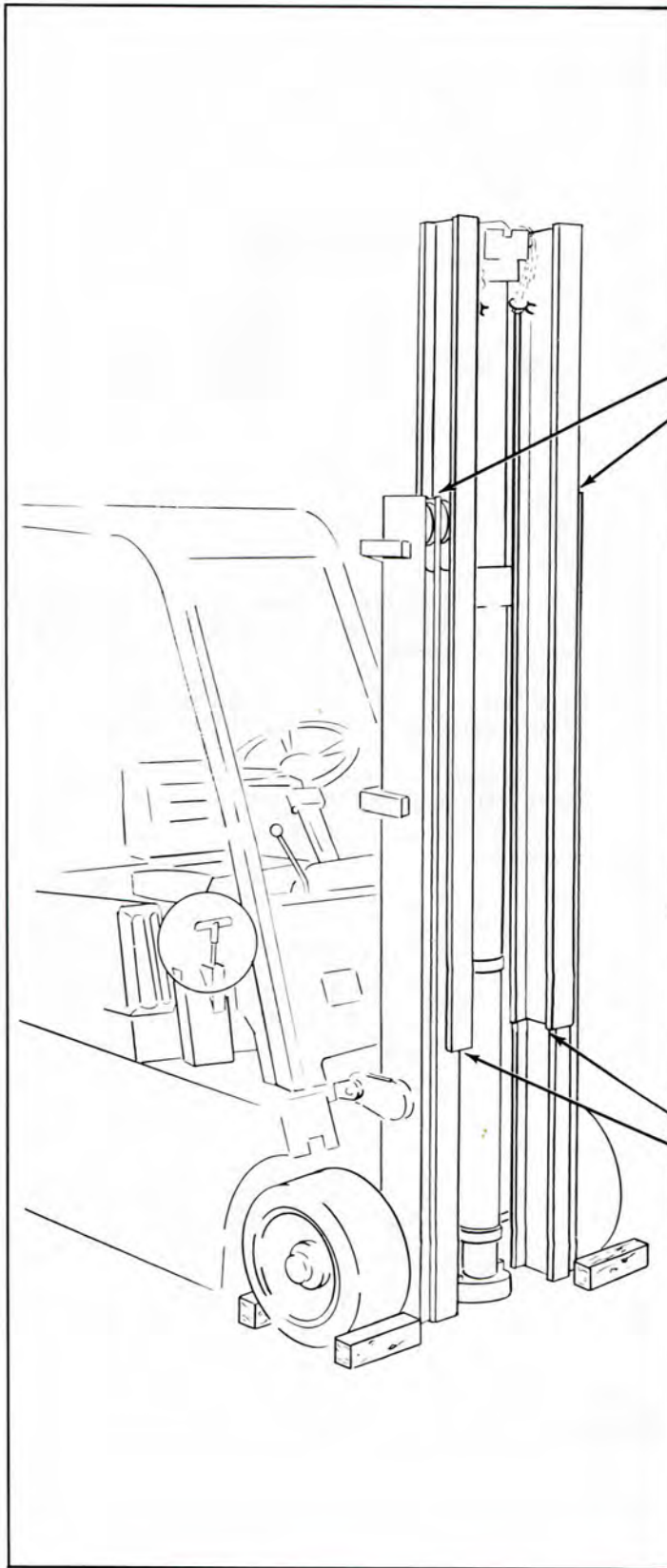
- Step 10(a). Place block between upper tie bars. Lower inner rail until block supports it.  
 (b). Unhook lifting device.
- Step 11. Install mechanical safety stops. Be sure to install lock washer and screw fasteners.
- Step 12. Guide piston into anchor with one hand and move the lift lever with the other.
- Step 13. Secure lift cylinder to anchor.
- (a). Install segment ring.
- (b). Install retainer ring and remove both slotted machine screws.
- (c). Install snap ring.
- (d). Raise and lower to full positions checking piston and anchor. Remove block between tie bars.



# INDUSTRIAL TRUCK DIVISION



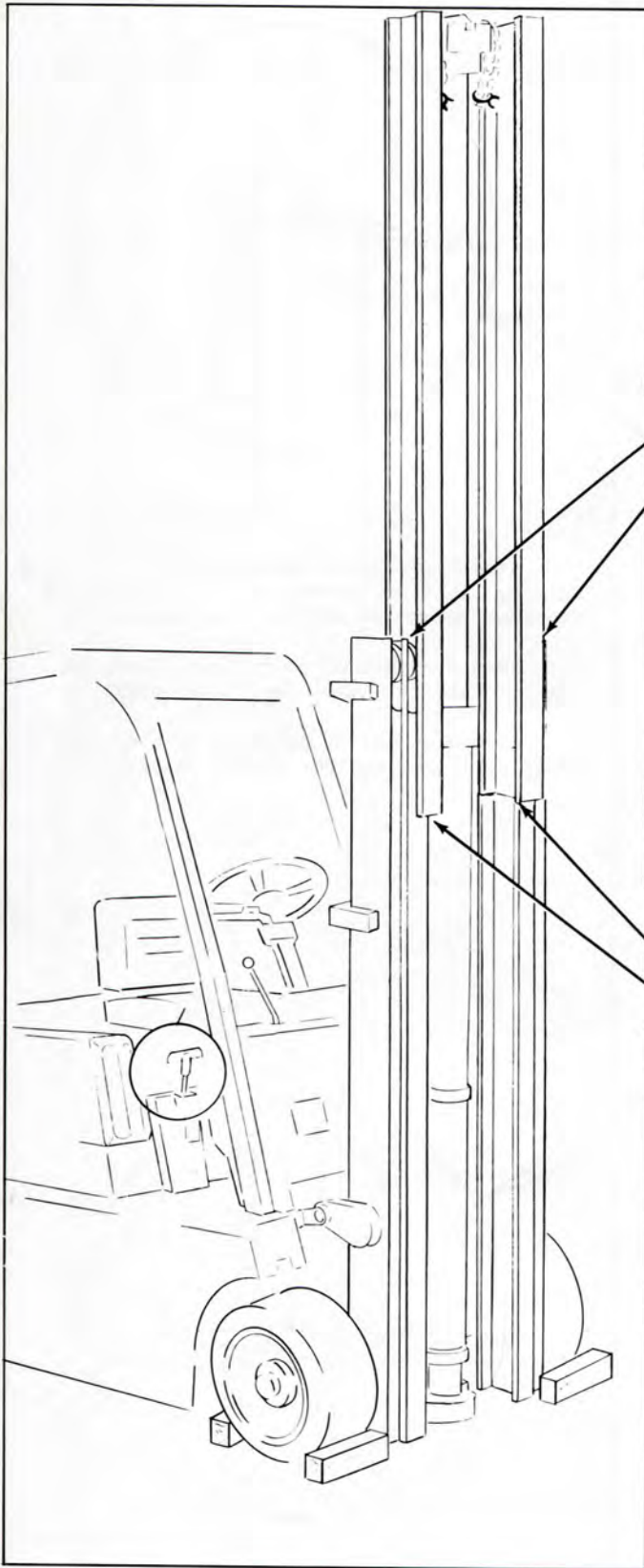
*[Faint, illegible text, likely a technical specification or description of the component shown in the drawing above.]*



Step 1(b). Raise inner rail to 1/2 of its full up position. Check roller clearance in the same manner as before.

Record number of shims to be used, on intermediate rail (for top roller only).

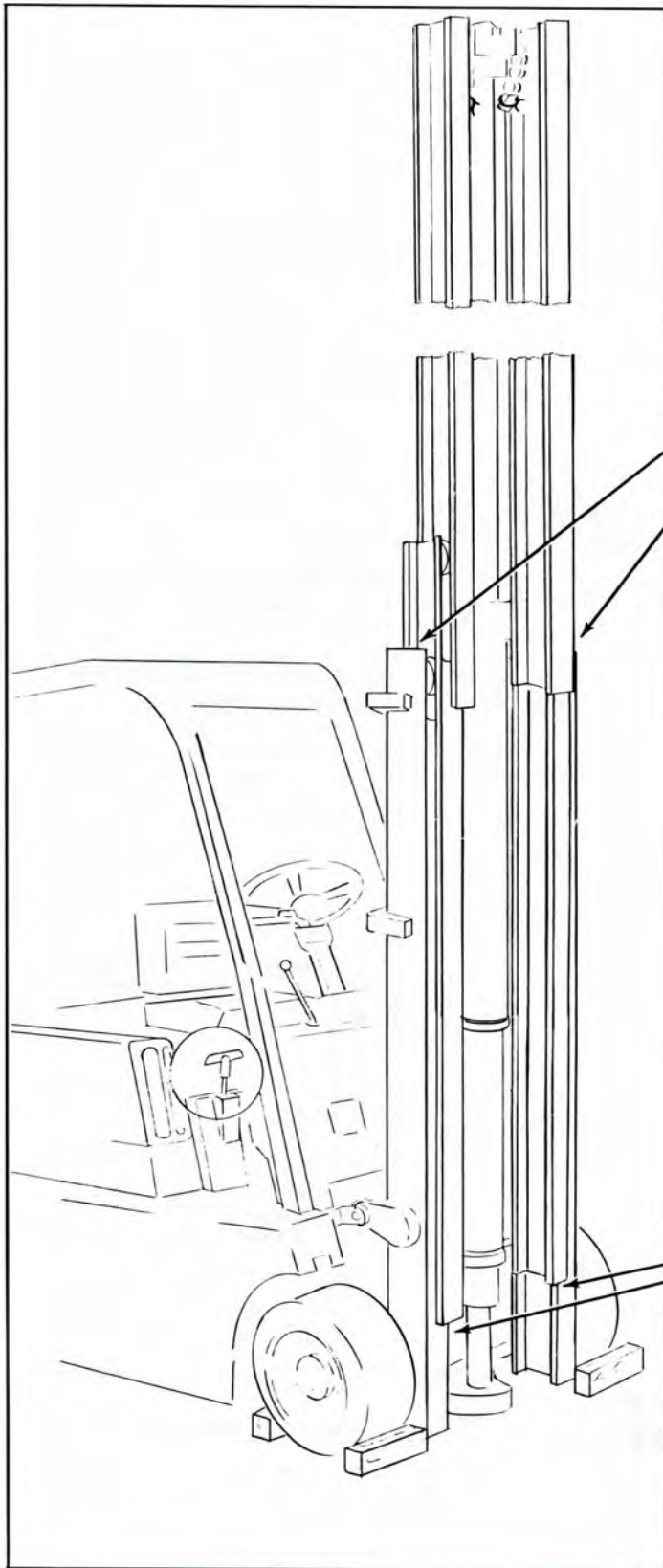
Record number of shims to be used, on inner rail (for bottom rollers only).



Step 1(c). Raise inner rail to full up position. Check roller clearance in the same manner as before.

Record number of shims to be used, on intermediate rail (for top rollers only).

Record number of shims to be used, on inner rail (for bottom rails only).

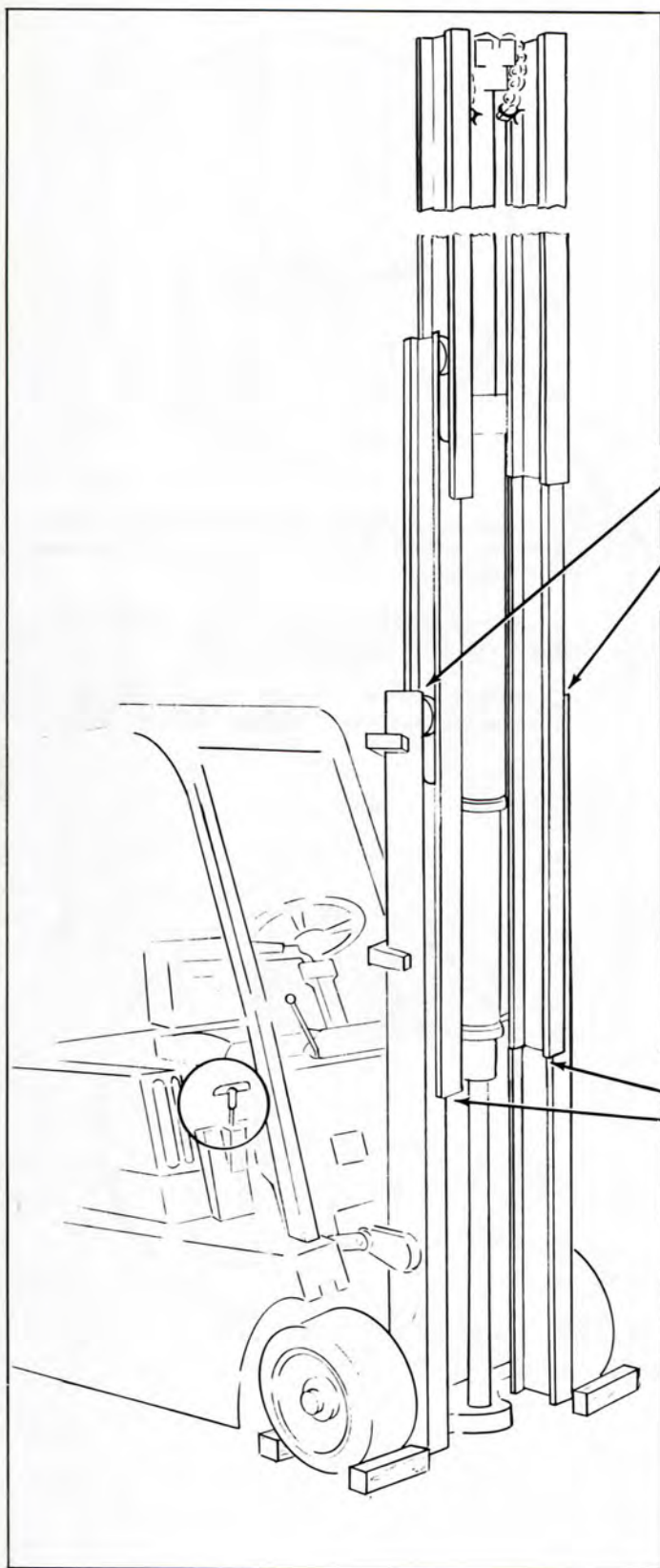


Step 2(a). Raise intermediate rail about 5 inches. Check roller clearance in the same manner as before.

Record number of shims to be used, on outer rail (for top rollers only).

Record number of shims to be used, on intermediate rail (for bottom rollers only).

Plate 9639



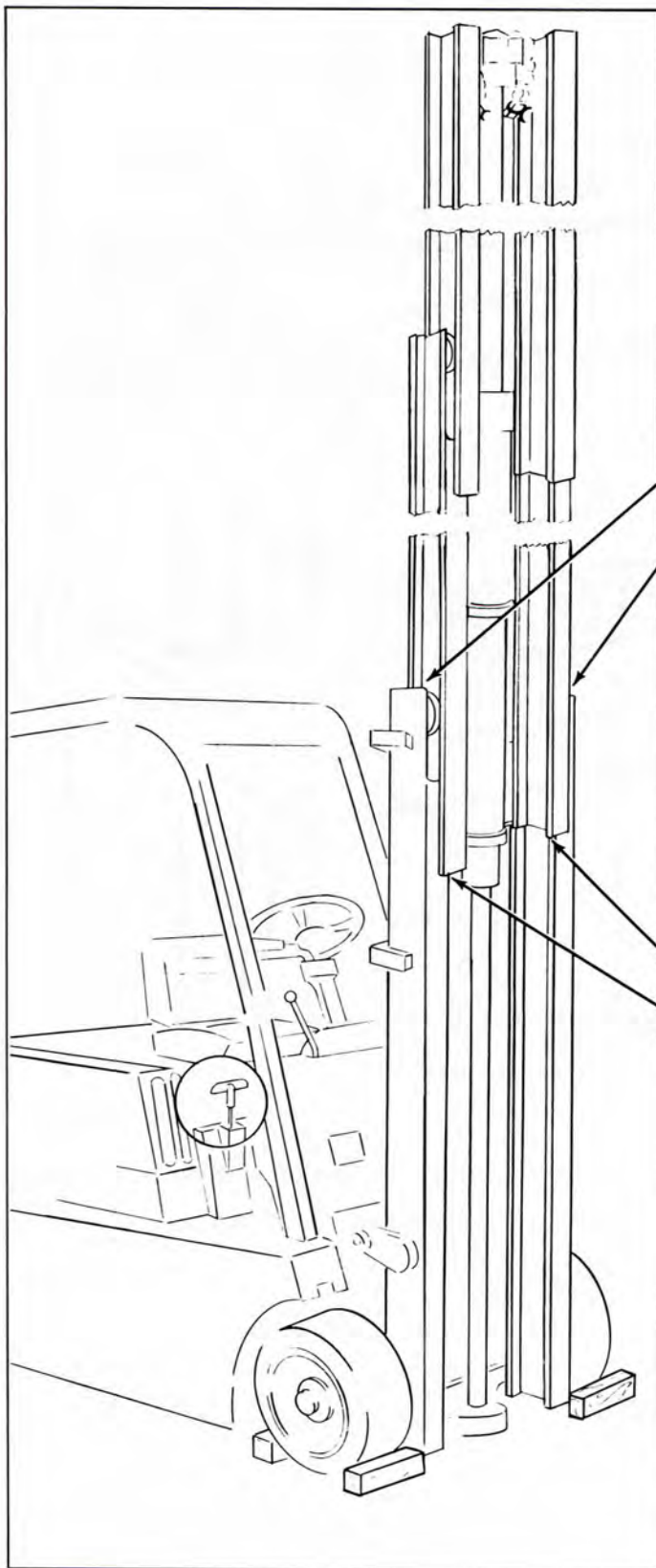
Step 2(b). Raise intermediate rail to 1/2 its full up position. Check roller clearance in the same manner as before.

Record number of shims to be used, on outer rail (for top rollers only).

Record number of shims to be used, on intermediate rail (for bottom rollers only).

Plate 9640





Step 2(c). Raise intermediate rail to full up position. Check roller clearance in the same manner as before.

Record number of shims to be used, on outer rail (for top rollers only).

Record number of shims to be used, on inner rail (for bottom rollers only).

Plate 9641

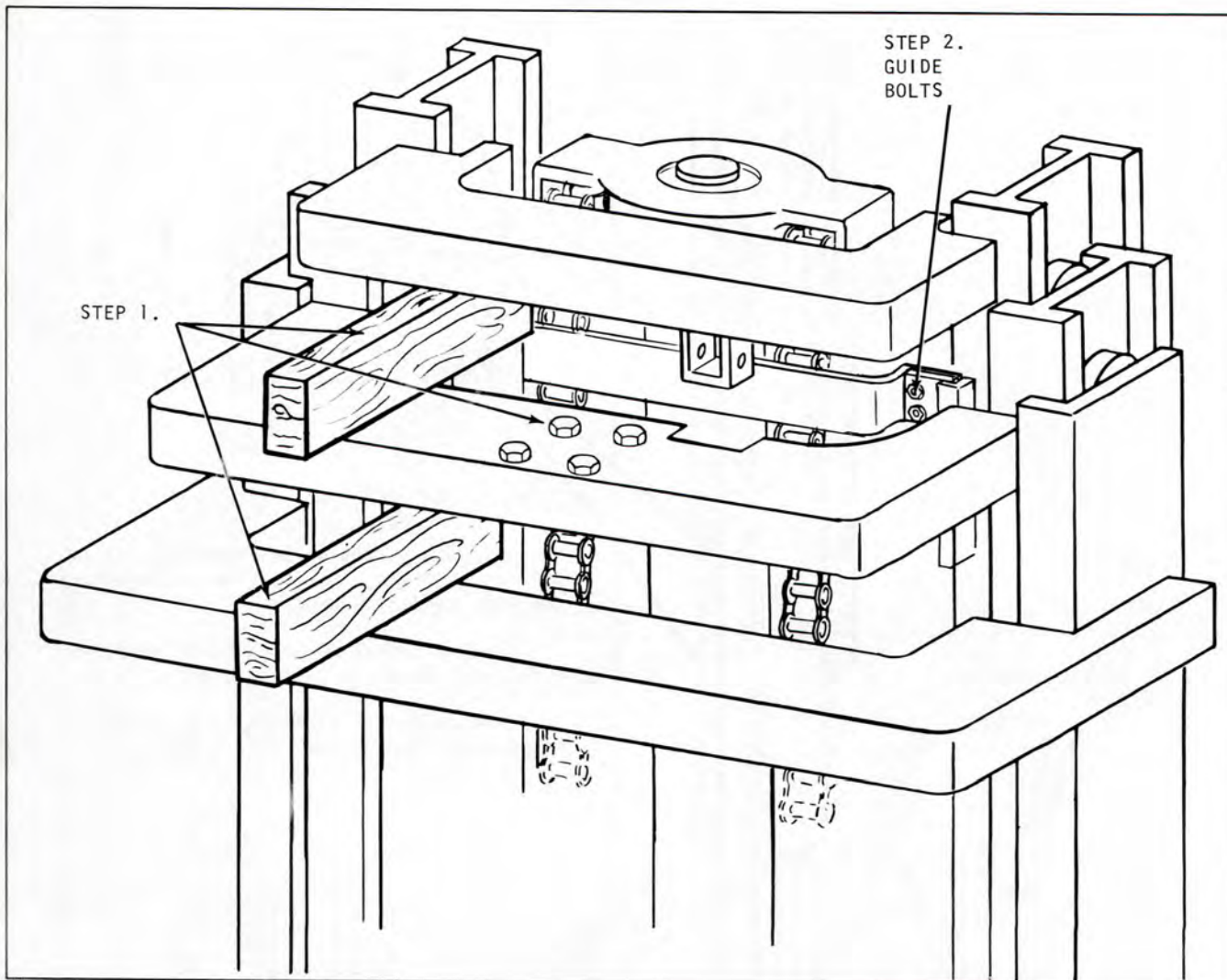
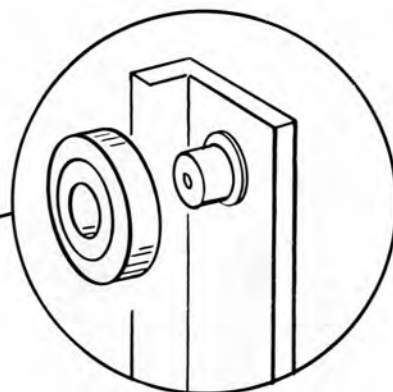
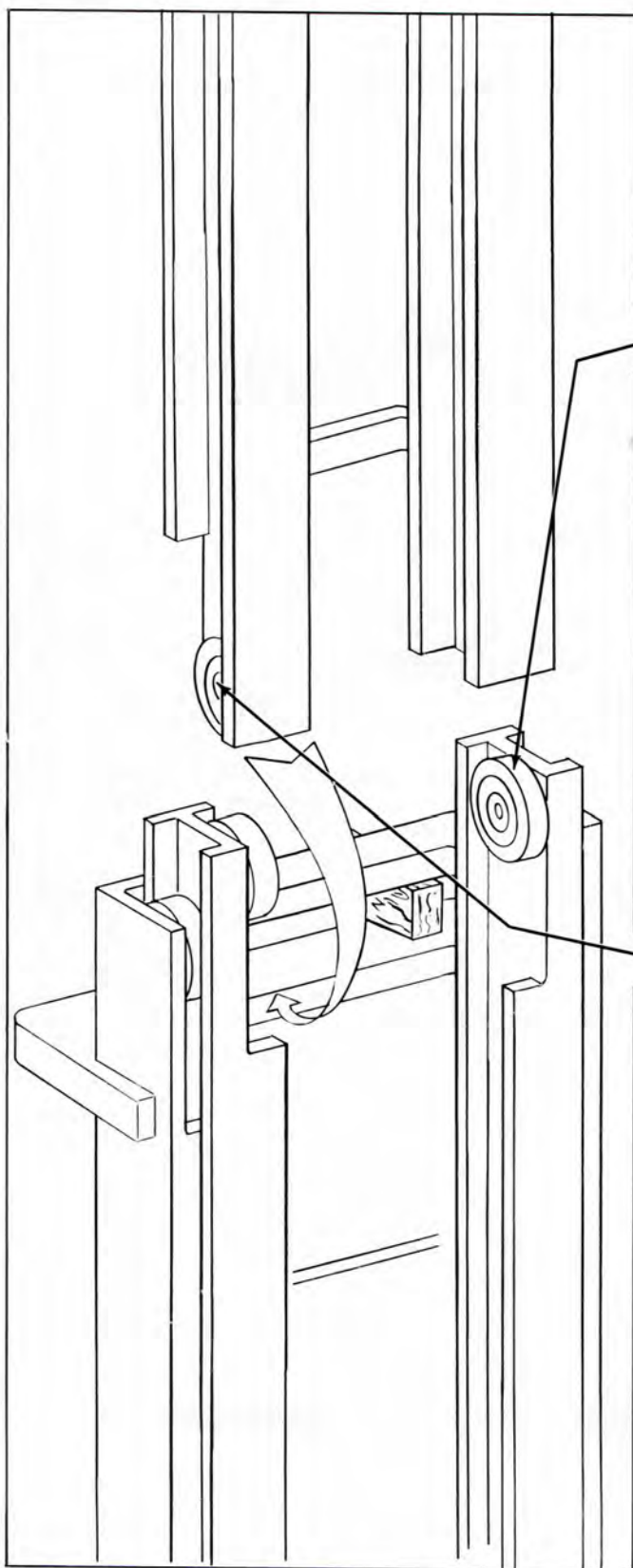


Plate 9642 Standard Triple Piston Head

REMOVAL OF RAILS--STANDARD TRIPLE

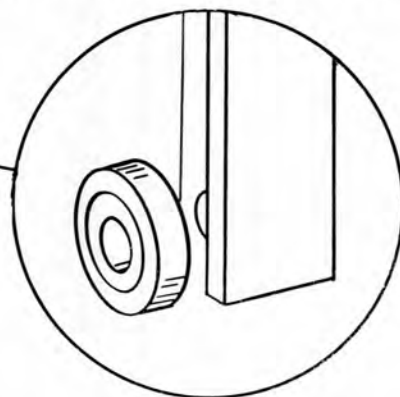
- Step 1. Place blocks between inner and intermedaite rail tie bars. Remove mechanical safety stops.
- Step 2. Pull piston head down far enough to get at piston head guide bolts. Remove both piston head guides.
- Step 3. Pull piston head to full down position.

Step 4. Remove inner rail and leave it in this position while adjusting rollers.



**A. Intermediate rail rollers:**

1. Count the number of shims at the right and left hand rollers.
2. Look at the three (3) numbers you recorded on the intermediate rail in Step 1. The smallest of these numbers is the total number of shims to be added. A "0" means DO NOT add shims.
3. Your target for adjusting is to have the same number of shims at each upper roller. If you end up with an extra shim DO NOT remove it. Mark the side having an extra shim.



**B. Inner rail rollers.**

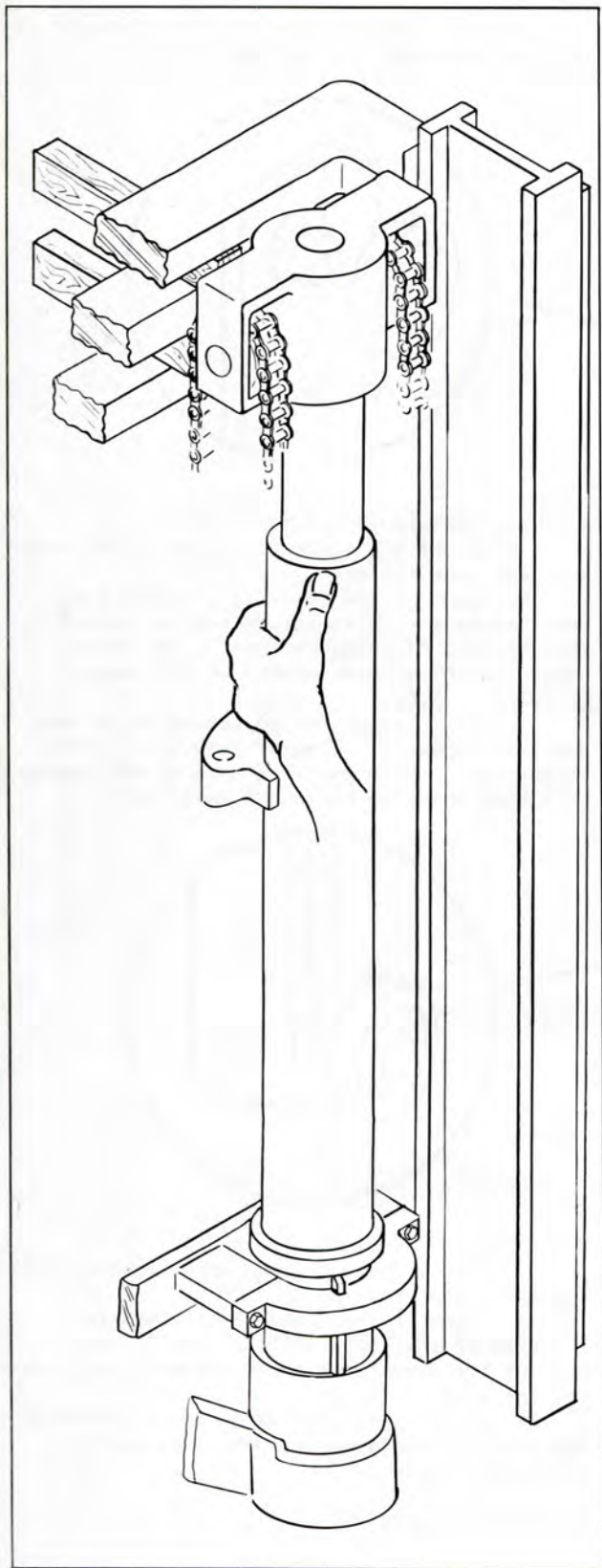
1. Count the number of shims at the right and left hand rollers.
2. Look at the three (3) numbers you recorded on the inner rail in Step 1. Go through the same steps you followed in adjusting the upper rollers.
3. If you end up with an extra shim here too, be sure it is on the same side as the extra upper shim.

**C. Replace inner rail.**

**NOTE**

Refer to next page.

Plate 9643



N O T E

With one hand pull piston head forward to let tie bar pass by piston head freely.

Plate 9644

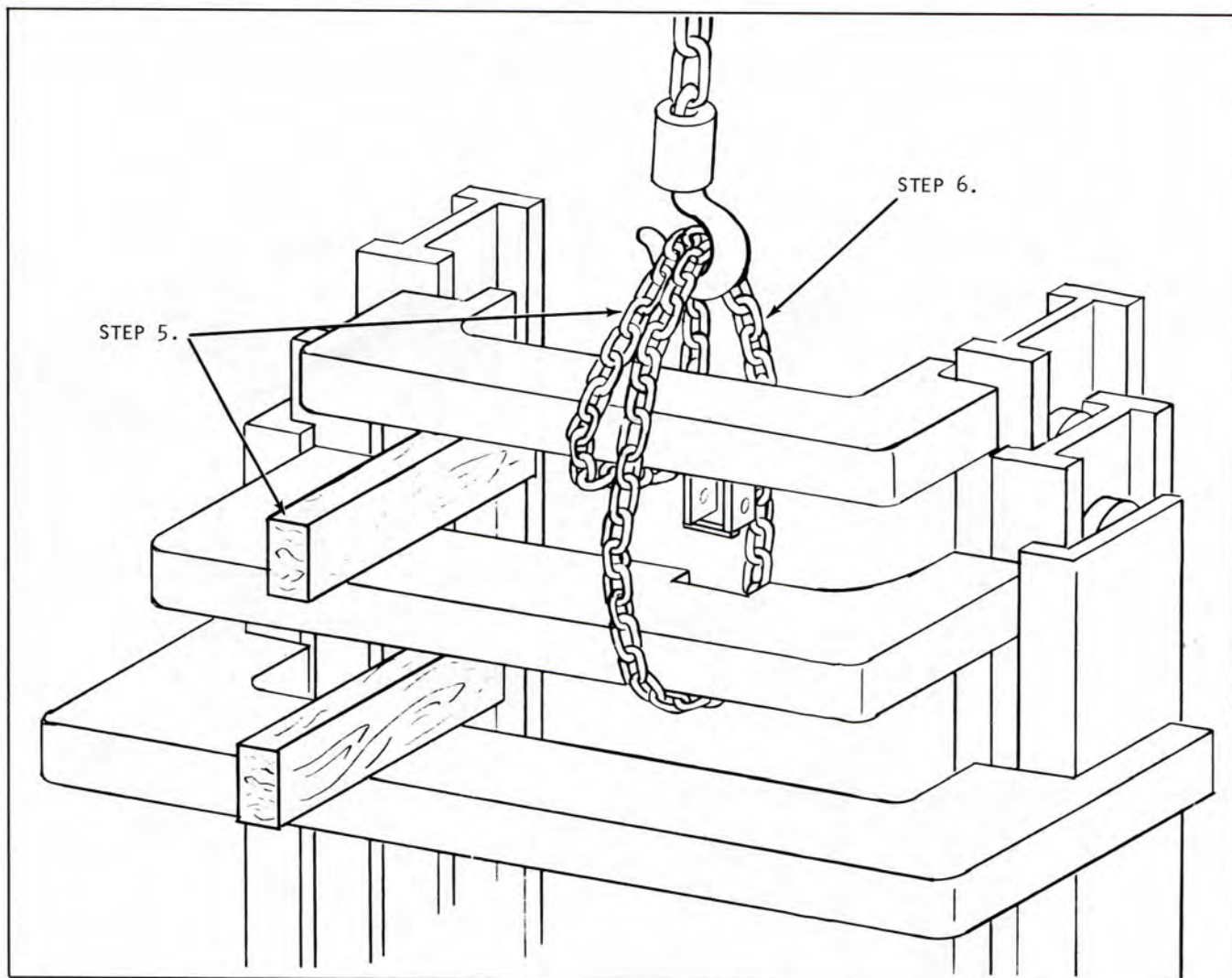


Plate 9645 Chain Placement

Step 5. Replace block and remove chain hoist.

Step 6. Remove intermediate rail assembly.

(a). Place chain around inner and intermediate rail assembly as shown above.

Step 6(b). Place a strap or chain around outer rail and secure. This will support lift cylinder.

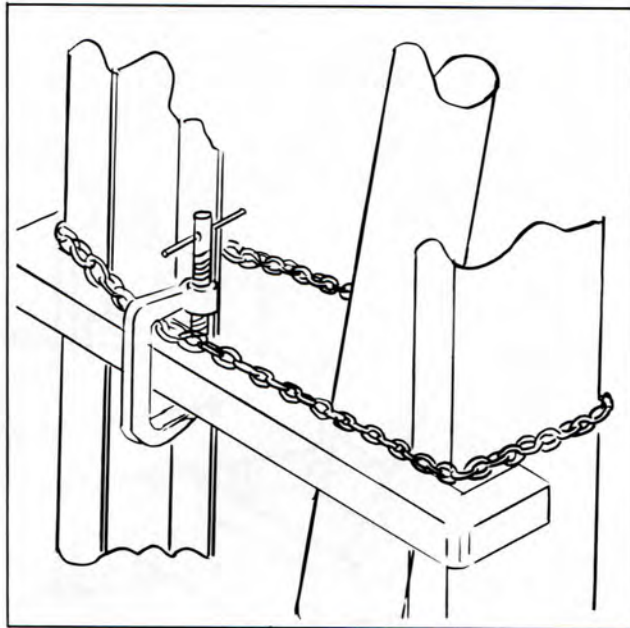


Plate 9628

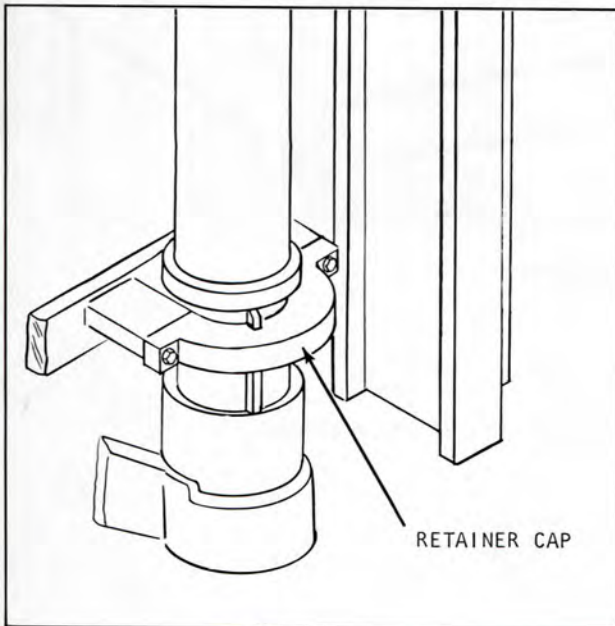
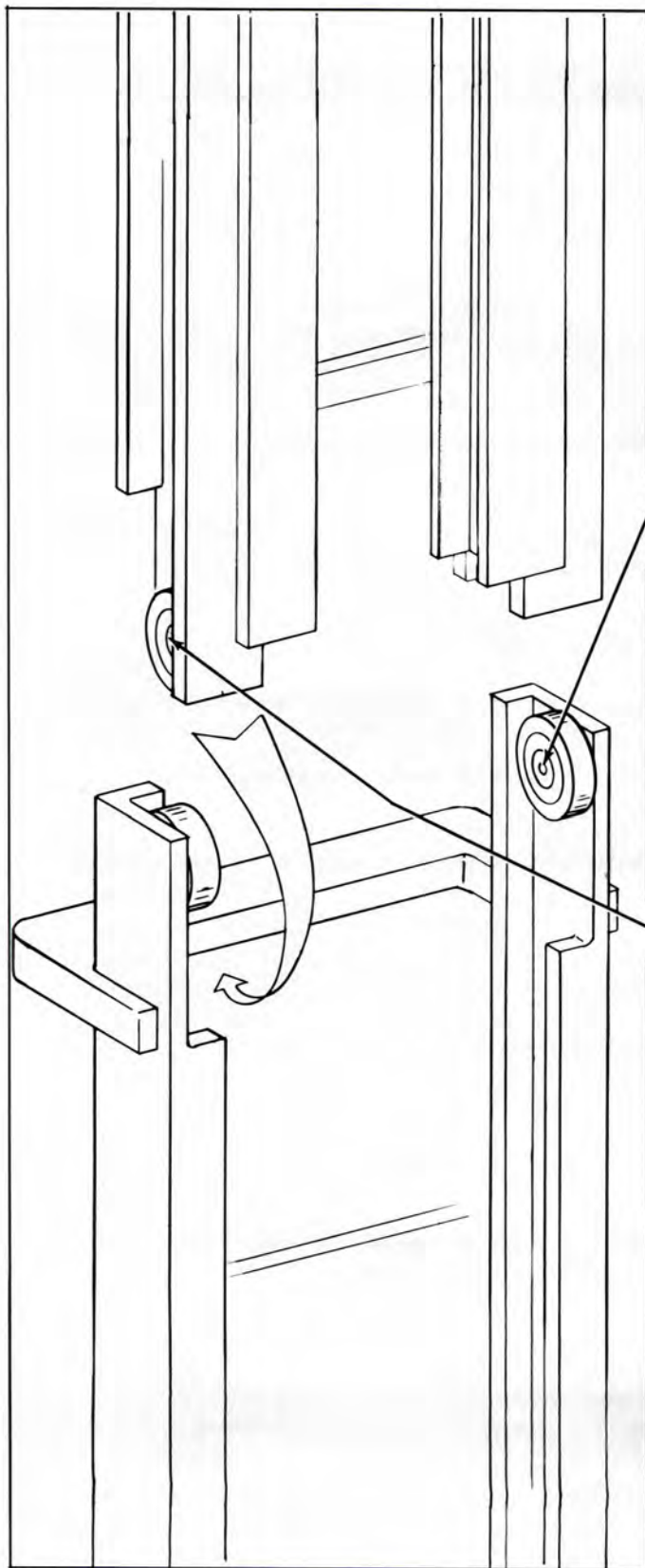


Plate 9646

Step 6(c). Remove lift cylinder retainer cap.



Step 6(d). Lean cylinder forward to rest on strap, as shown in Plate

Step 6(e). Leave intermediate rail assembly in this position while adjusting rollers.

**A. Outer rail rollers:**

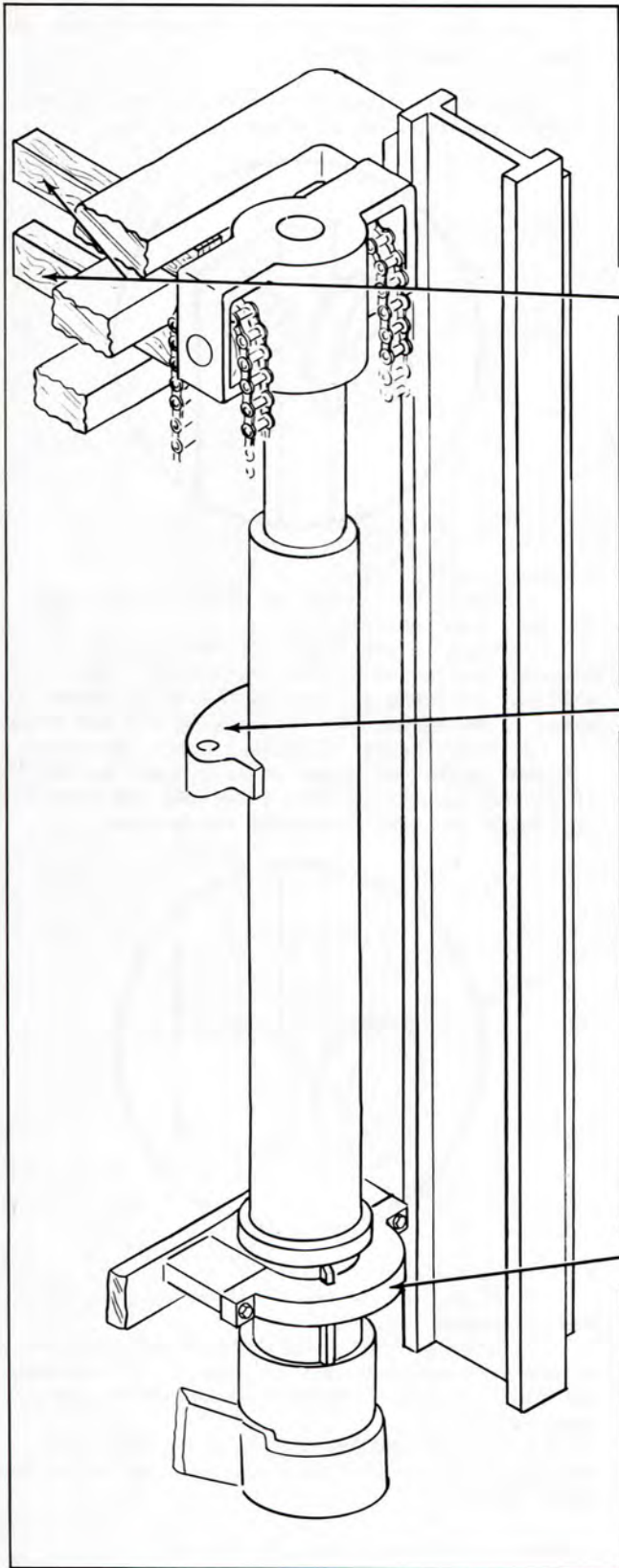
1. Count the number of shims at the right and left hand rollers.
2. Look at the three (3) numbers you recorded on the outer rail in Step 1. The smallest of these numbers is the total number of shims to be added. A "0" means DO NOT add shims.
3. Your target for adjustment is to have the same number of shims at each upper roller. If you end up with an extra shim DO NOT remove it. Mark the side having an extra shim.

**B. Intermediate rail rollers:**

1. Count the number of shims at the right and left hand rollers.
2. Look at the three numbers you recorded on the intermediate rail in Step 1. Go through the same steps you followed in adjusting the upper rollers.
3. If you end up with an extra shim here too, be sure it is on the same side as the extra upper shim.

C. Replace intermediate rail assembly.

Plate 9647



Step 6(f). Replace block between intermediate rail assembly tie bar and remove chain.

Step 7. Place chain around chain anchors on cylinder. Use hoist to support cylinder.

Step 8. Remove supporting strap.

Step 9. Install cylinder retainer cap.

Plate 9648



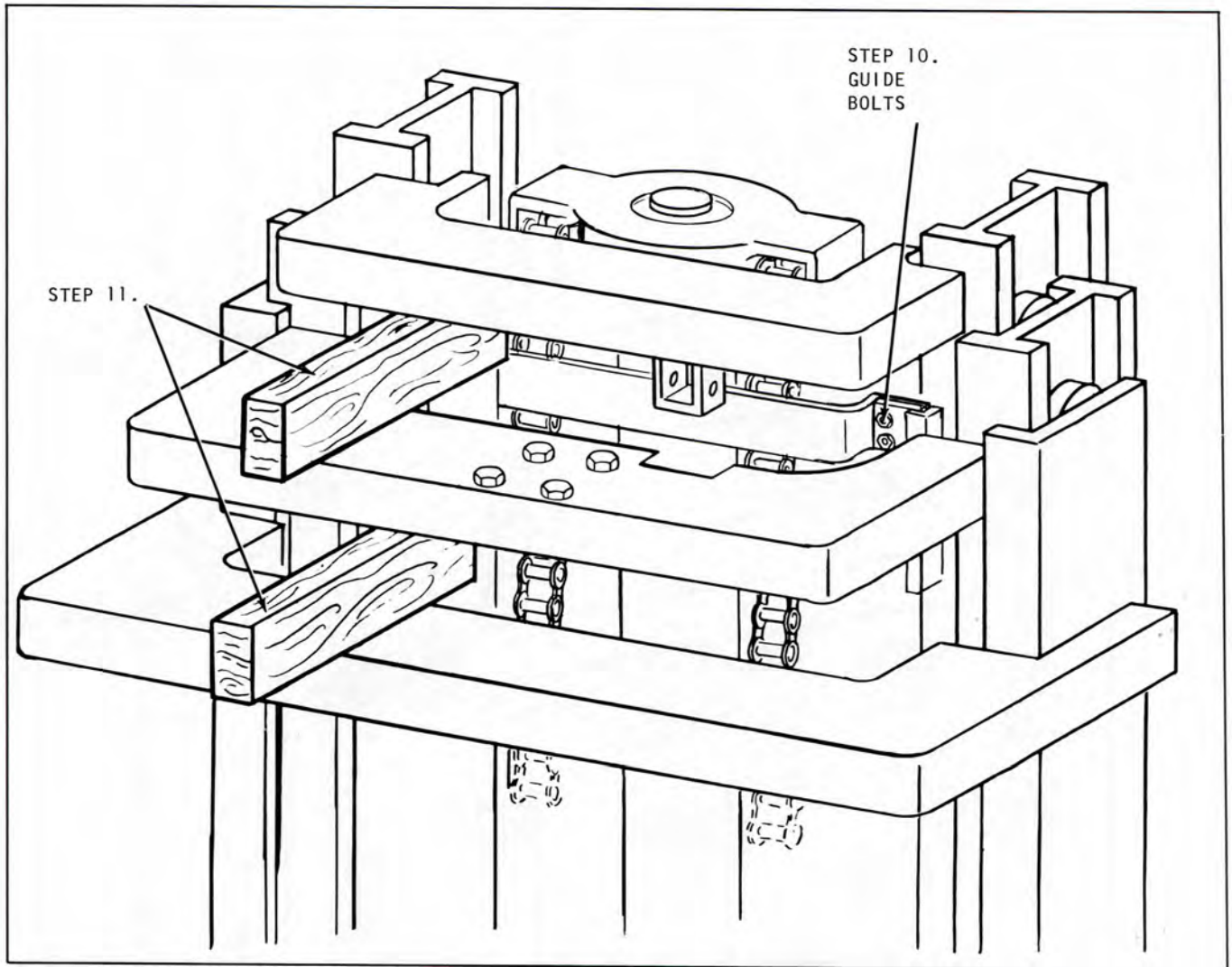


Plate 9649 Standard Triple Piston Head

Step 10. Install both piston head guides.

Step 11. Install mechanical stop. Raise rails and remove blocks.

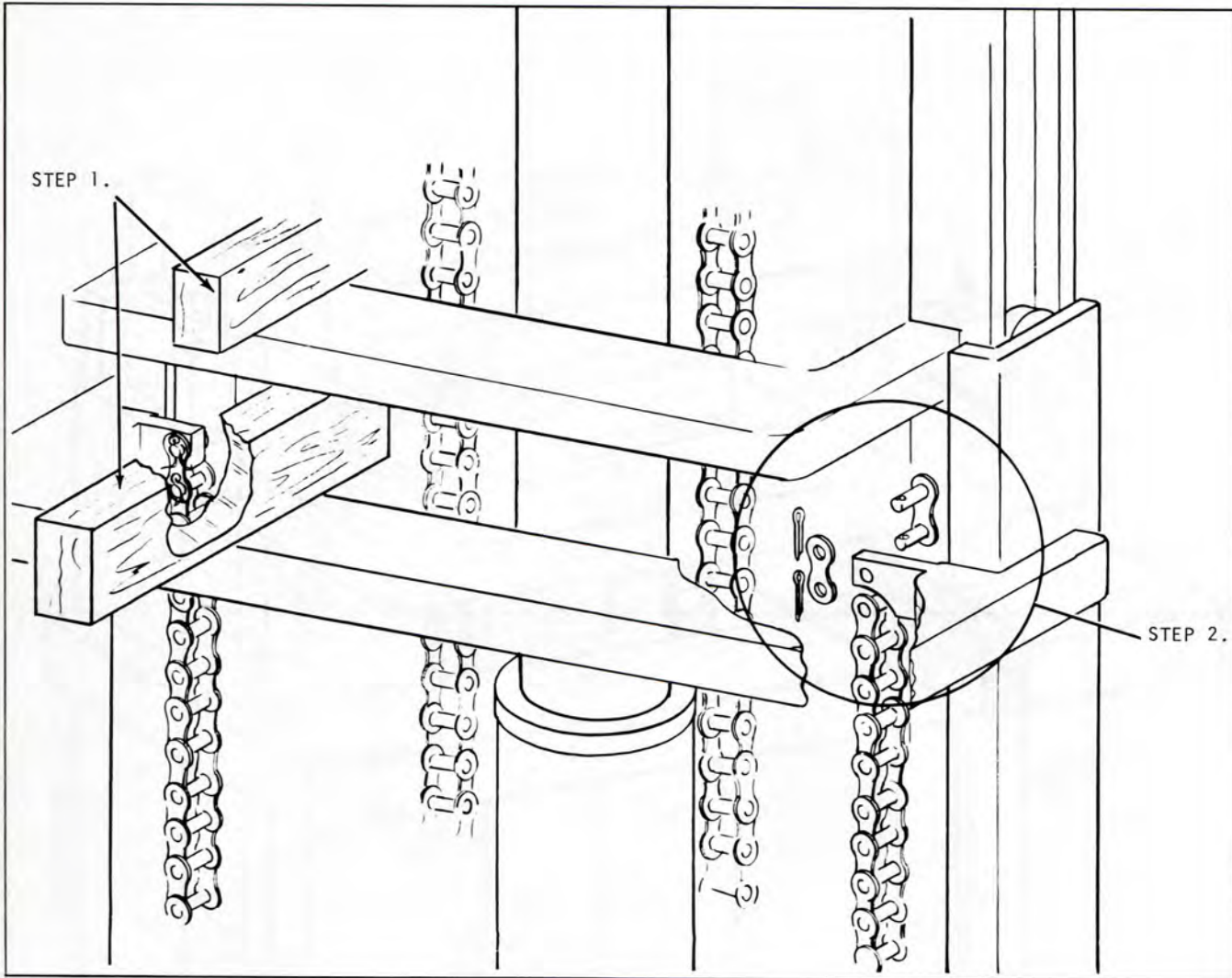


Plate 9650 Rear Lift Cylinder Removal

UPRIGHT REMOVAL--FULL FREELIFT TRIPLE

Step 1. Place blocks between inner and intermediate rail tie bars.

Step 2. Remove rear lift chains at the top or master link end.

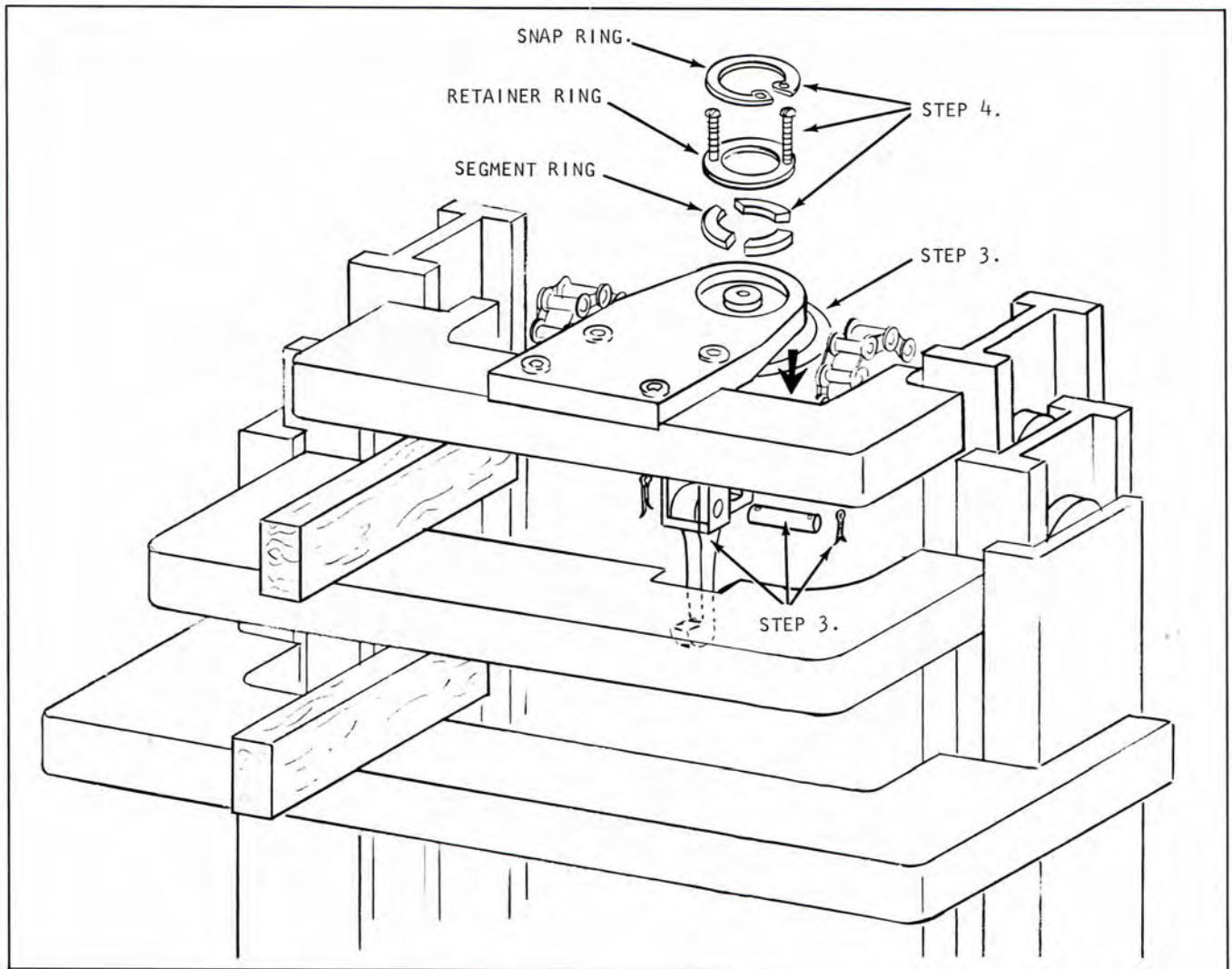


Plate 9651 F.F.T. Piston Head

Step 3. Pull piston head down

Remove mechanical safety stop pin and remove stop.

Step 4(a). Secure piston head with chain hoist.

(b). Remove lift cylinder from upper anchor.

1. Remove snap ring.

2. Place two (2) #6-32X2" round head slotted machine screws (in holes provided) in retainer ring.

(c). Remove segment ring.

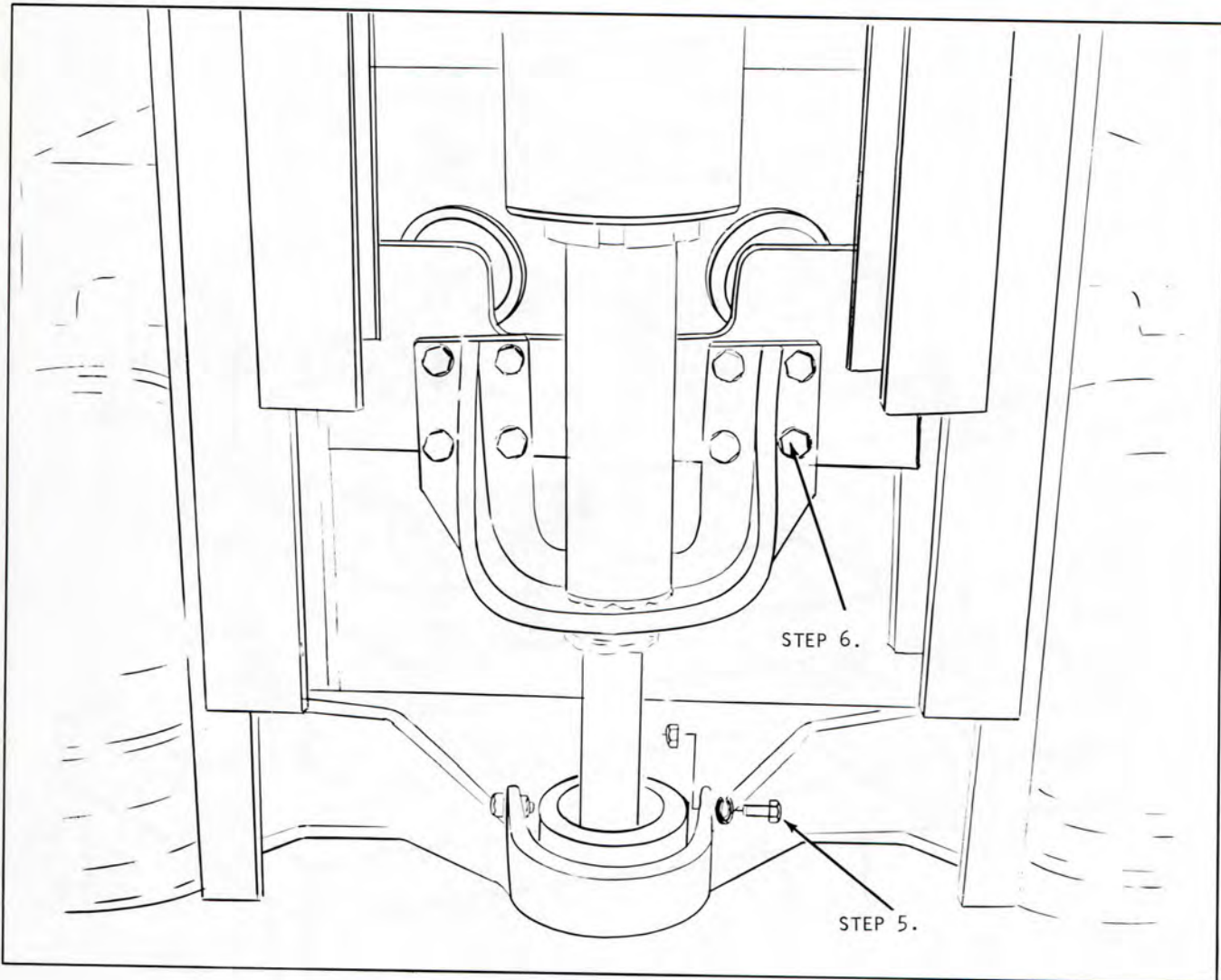


Plate 9652 Cylinder Lifting Bracket

Step 5. Remove lift cylinder support bolts.

Step 6. Remove cylinder lifting bracket.

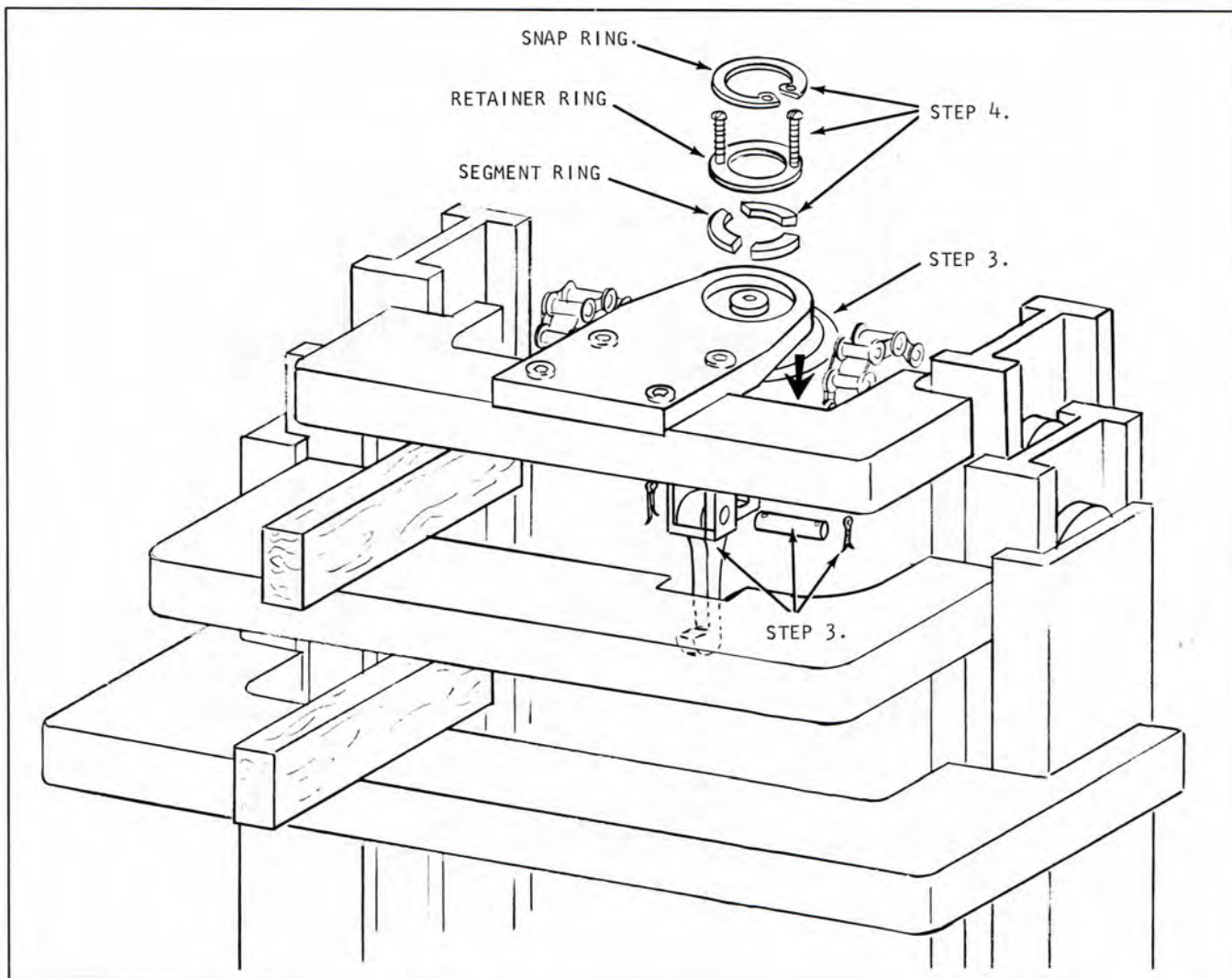


Plate 9651 F.F.T. Piston Head

Step 3. Pull piston head down

Remove mechanical safety stop pin and remove stop.

Step 4(a). Secure piston head with chain hoist.

(b). Remove lift cylinder from upper anchor.

1. Remove snap ring.

2. Place two (2) #6-32X2" round head slotted machine screws (in holes provided) in retainer ring.

(c). Remove segment ring.

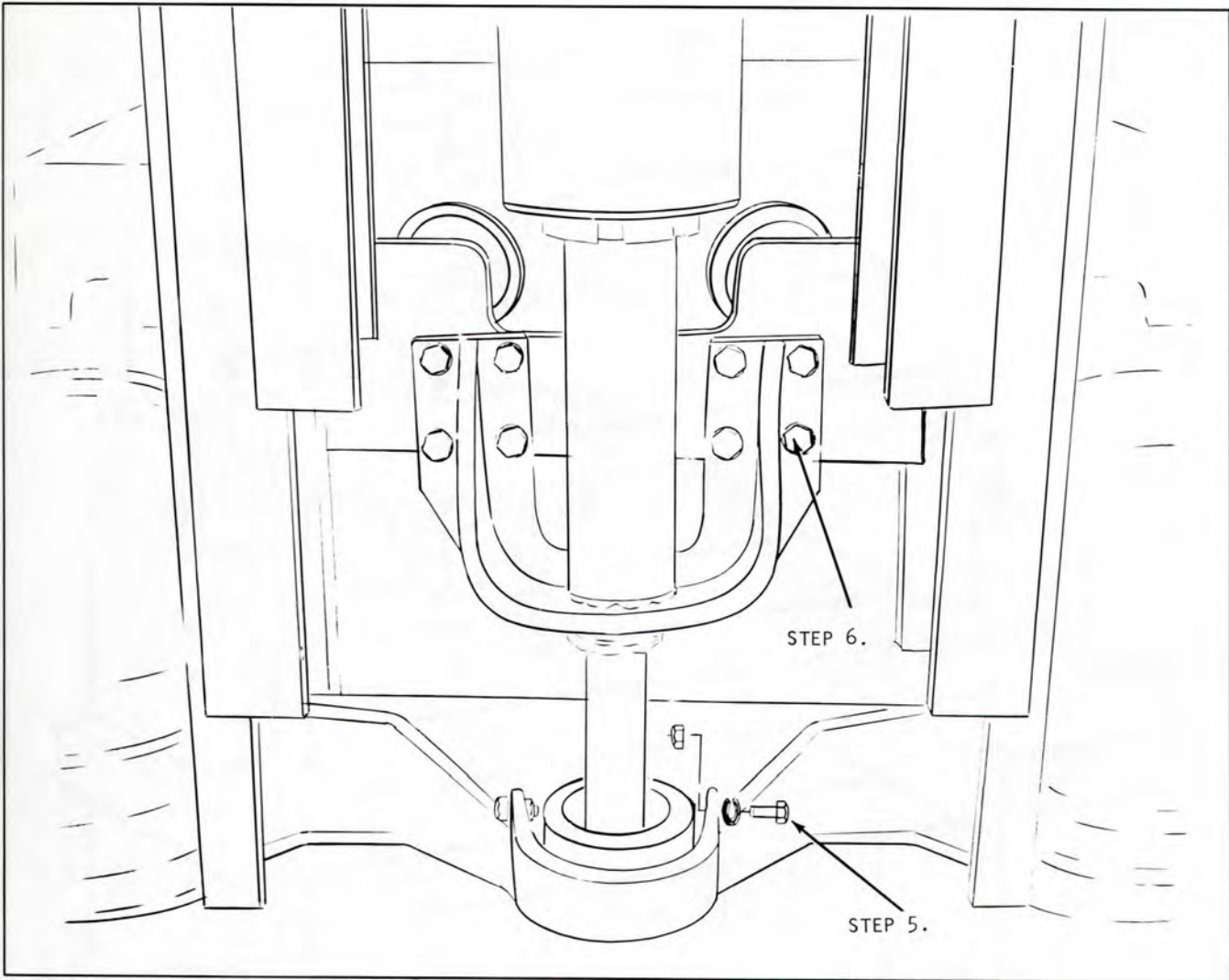


Plate 9652 Cylinder Lifting Bracket

Step 5. Remove lift cylinder support bolts.

Step 6. Remove cylinder lifting bracket.

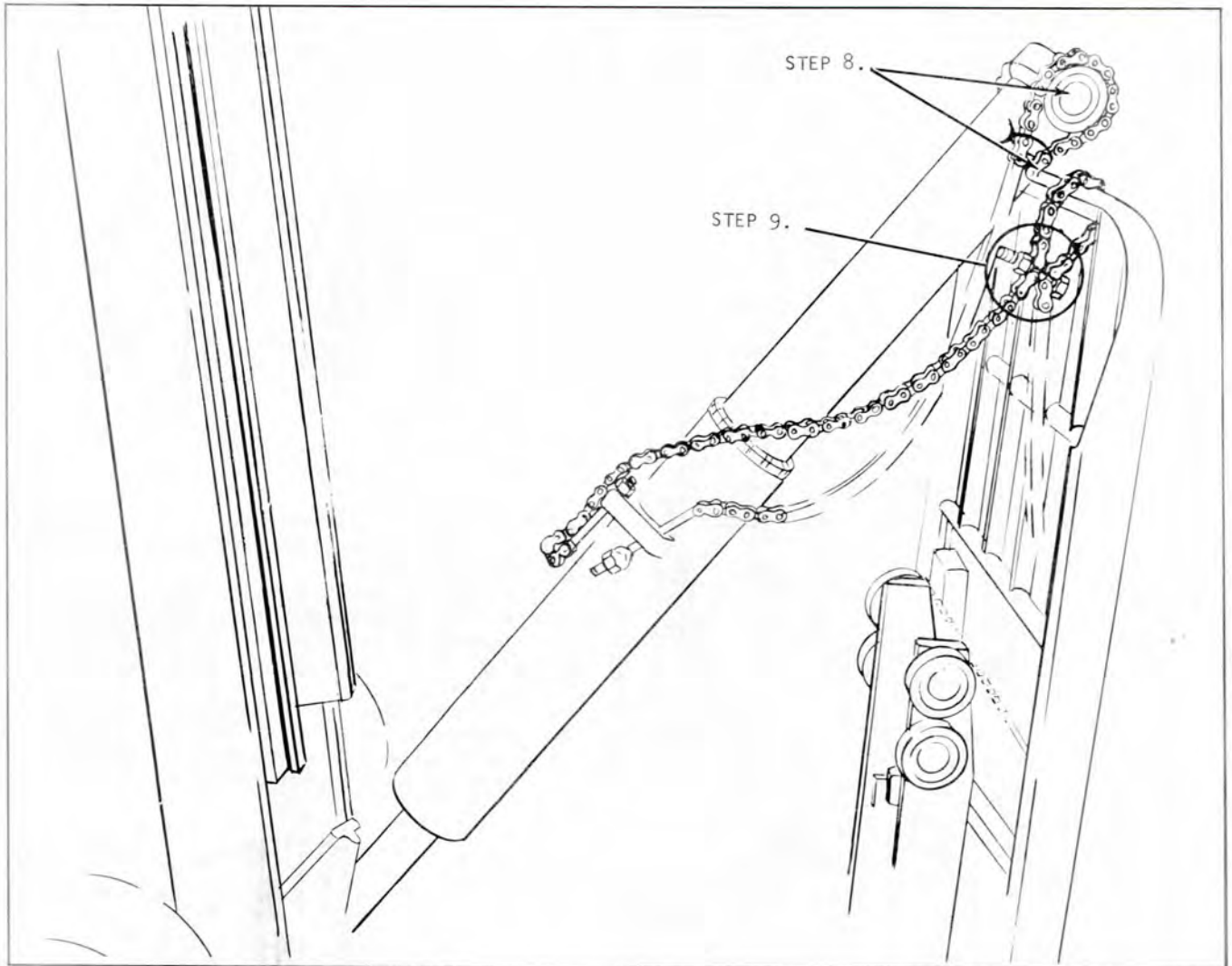


Plate 9653 Supporting Cylinder

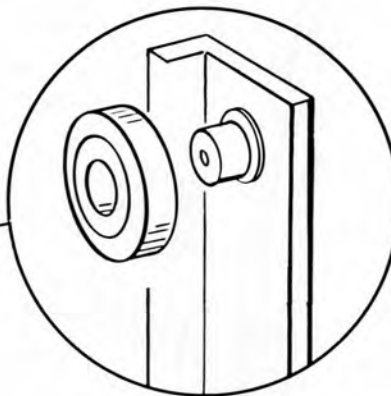
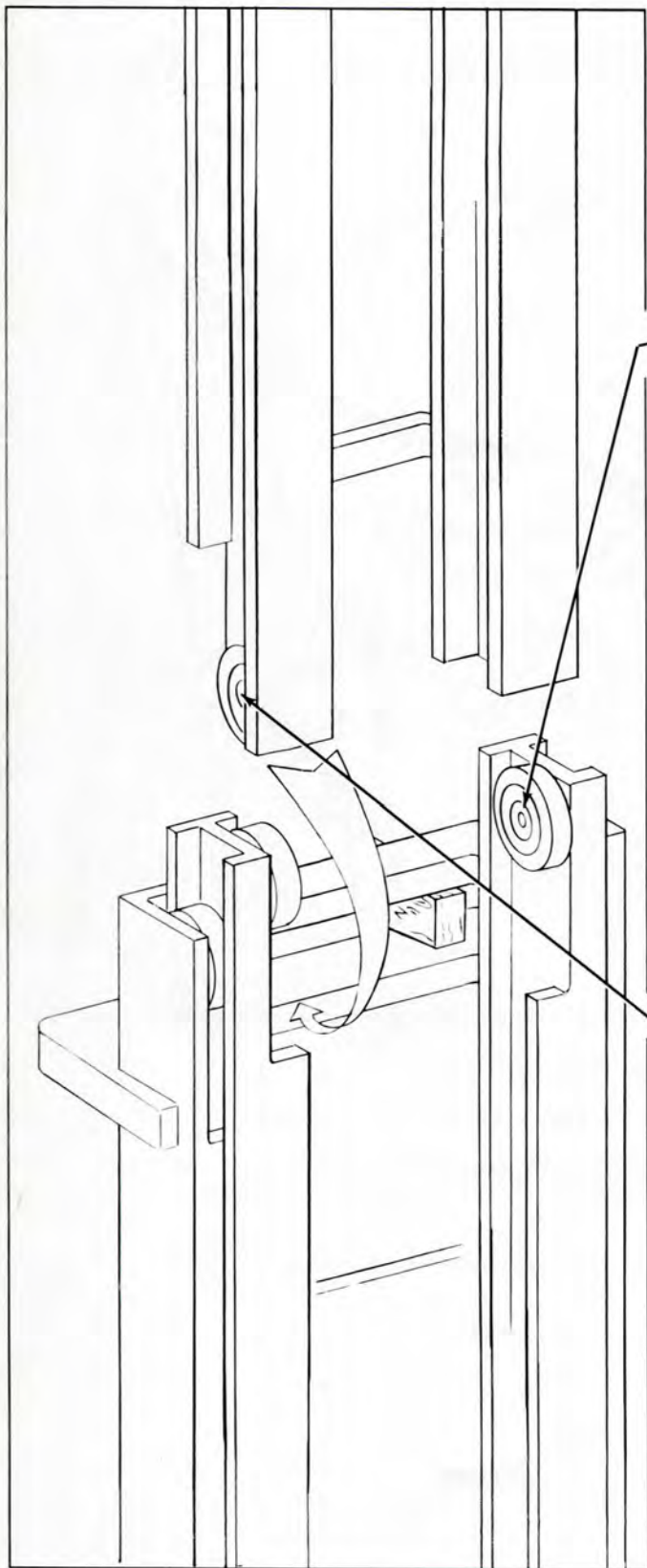
Step 7. Lower cylinder and lean it toward the load back rest (on the carriage).

Step 8. Place padding type material on the load back rest to prevent scoring of the cylinder.

Let cylinder rest onto load back rest.

Step 9. Place rear lift chains around top bar of load back rest and place bolts through chains, as shown above. This will prevent cylinder from falling.

Step 10. Remove inner rail and leave it in this position while adjusting rollers.

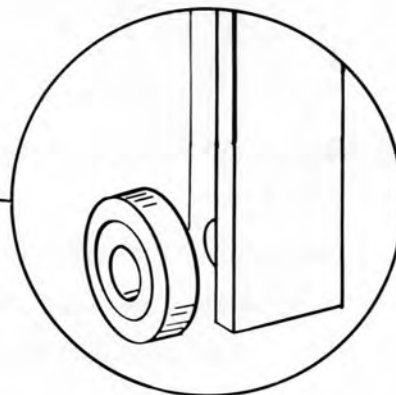


**A. Intermediate rail rollers:**

1. Count the number of shims at the right and left hand rollers.

2. Look at the three (3) numbers you recorded on the intermediate rail in Step 1. The smallest of these numbers is the total number of shims to be added. A "0" means DO NOT add shims.

3. Your target for adjusting is to have the same number of shims at each upper roller. If you end up with an extra shim DO NOT remove it. Mark the side having an extra shim.



**B. Inner rail rollers.**

1. Count the number of shims at the right and left hand rollers.

2. Look at the three (3) numbers you recorded on the inner rail in Step 1. Go through the same steps you followed in adjusting the upper rollers.

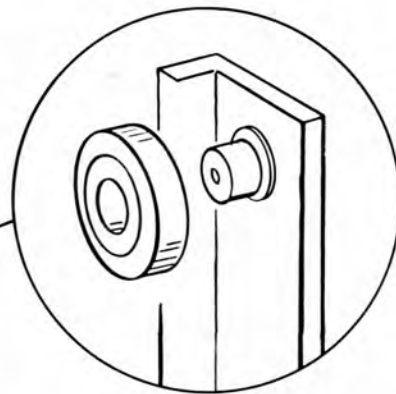
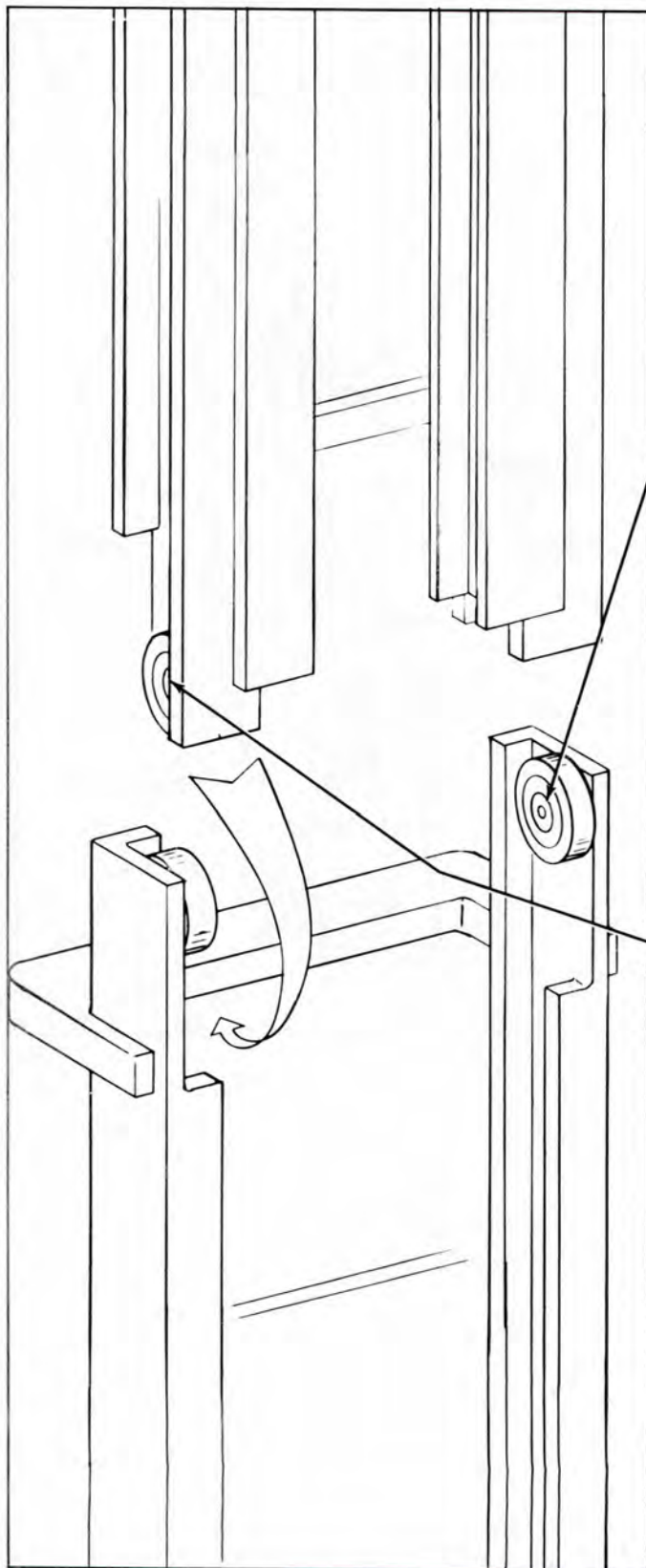
3. If you end up with an extra shim here too, be sure it is on the same side as the extra upper shim.

**C. Replace inner rail.**

Plate 9654

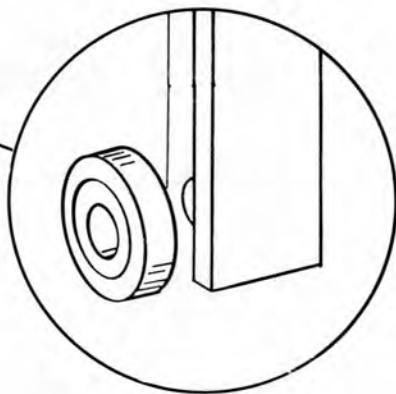


Step 11. Leave intermediate rail assem. in this position while adjusting rollers.



**A. Outer rail rollers:**

1. Count the number of shims at the right and left hand rollers.
2. Look at the three (3) numbers you recorded on the outer rail in Step 1. The smallest of these numbers is the total number of shims to be added. A "0" means DO NOT add shims.
3. Your target for adjustment is to have the same number of shims at each upper roller. If you end up with an extra shim DO NOT remove it. Mark the side having an extra shim.



**B. Intermediate rail rollers:**

1. Count the number of shims at the right and left hand rollers.
2. Look at the three numbers you recorded on the intermediate rail in Step 1. Go through the same steps you followed in adjusting the upper rollers.
3. If you end up with an extra shim here too, be sure it is on the same side as the extra upper shim.

**C. Replace intermediate rail assembly.**

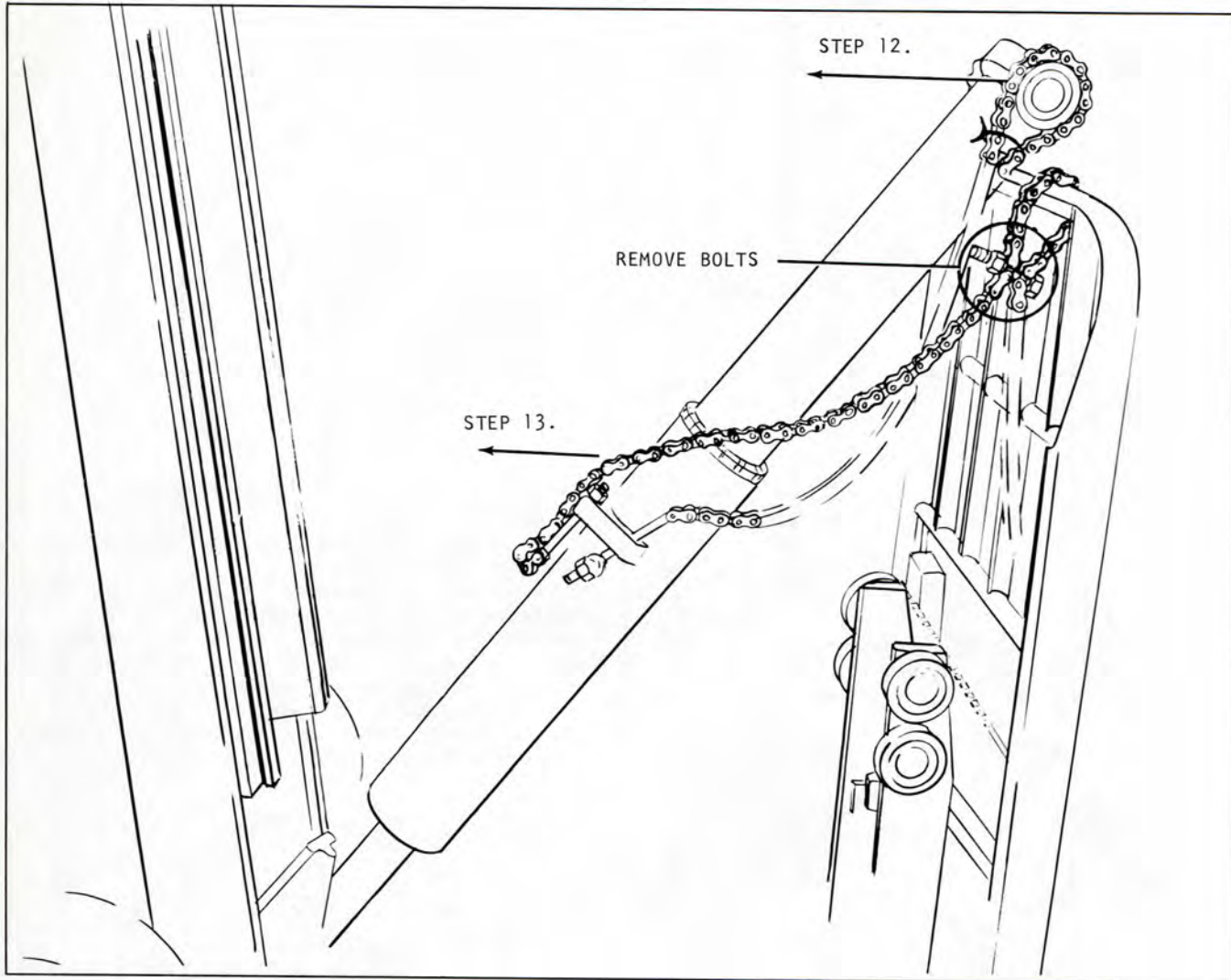


Plate 9656 Cylinder Replacement

Step 12. Using chain hoist, place cylinder back between rails.

N O T E

When installing cylinder watch position of cylinder line and tube, to prevent damage.

Step 13. Pull rear lift chains through back of upright.

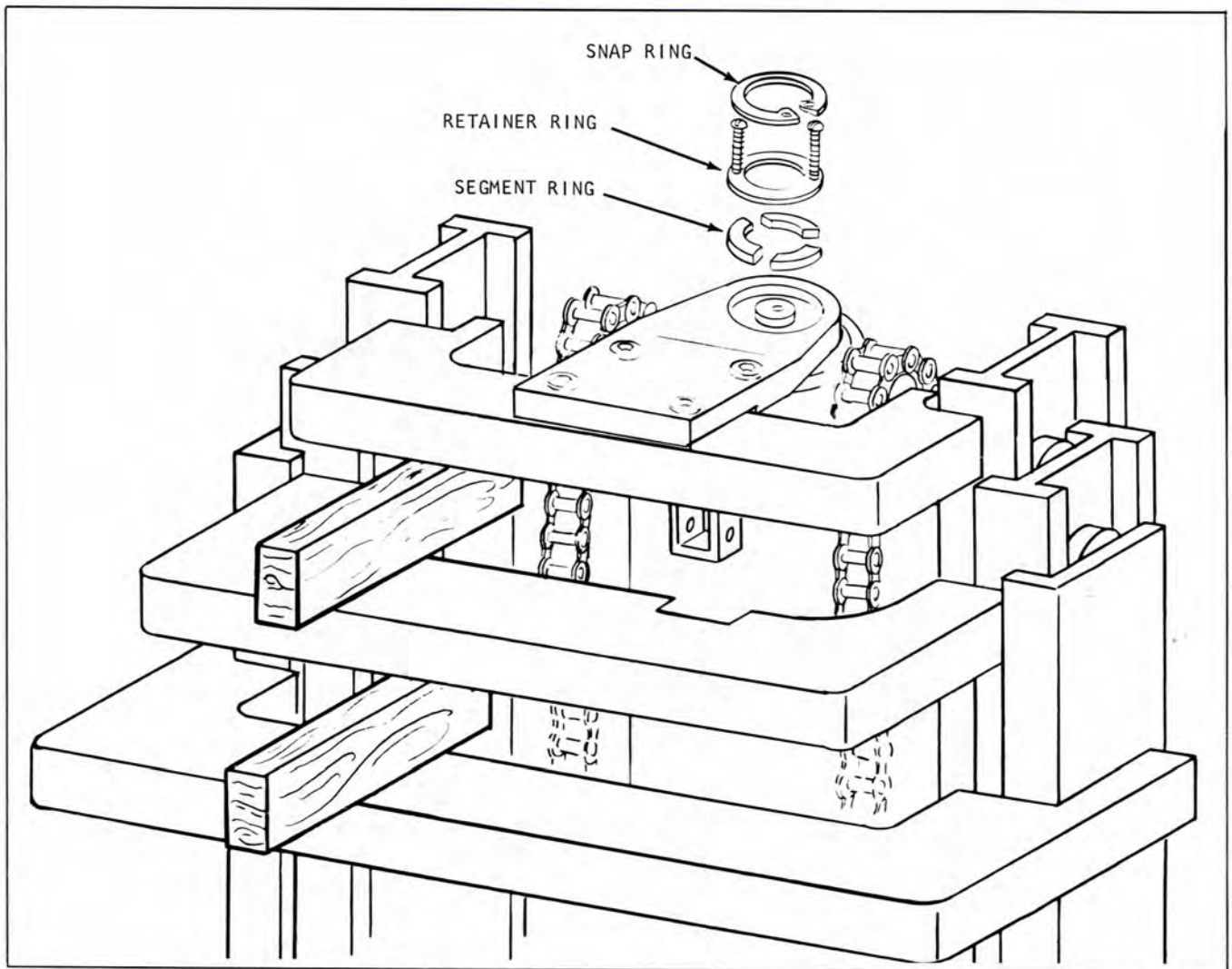


Plate 9657 Piston Head F.F.T.

Step 14(a). Install segment ring.

(b). Install retainer ring and remove both slotted machine screws.

(c). Install snap ring.

(d). Raise and lower to full positions checking piston and anchor. Remove blocks between tie bars.

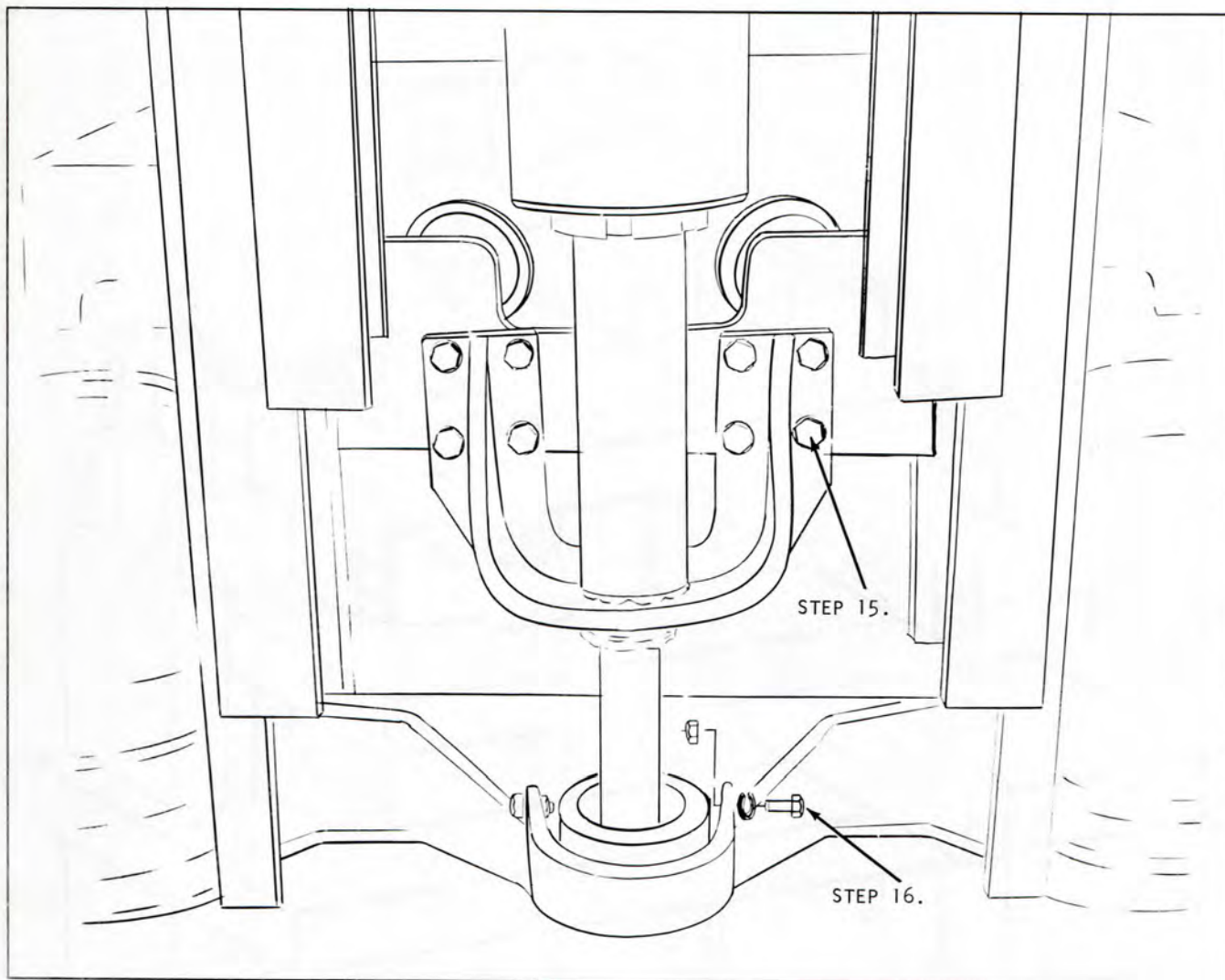


Plate 9658 Cylinder Lift Bracket

Step 15. Install cylinder lifting bracket.

Step 16. Install lift cylinder support bolts.

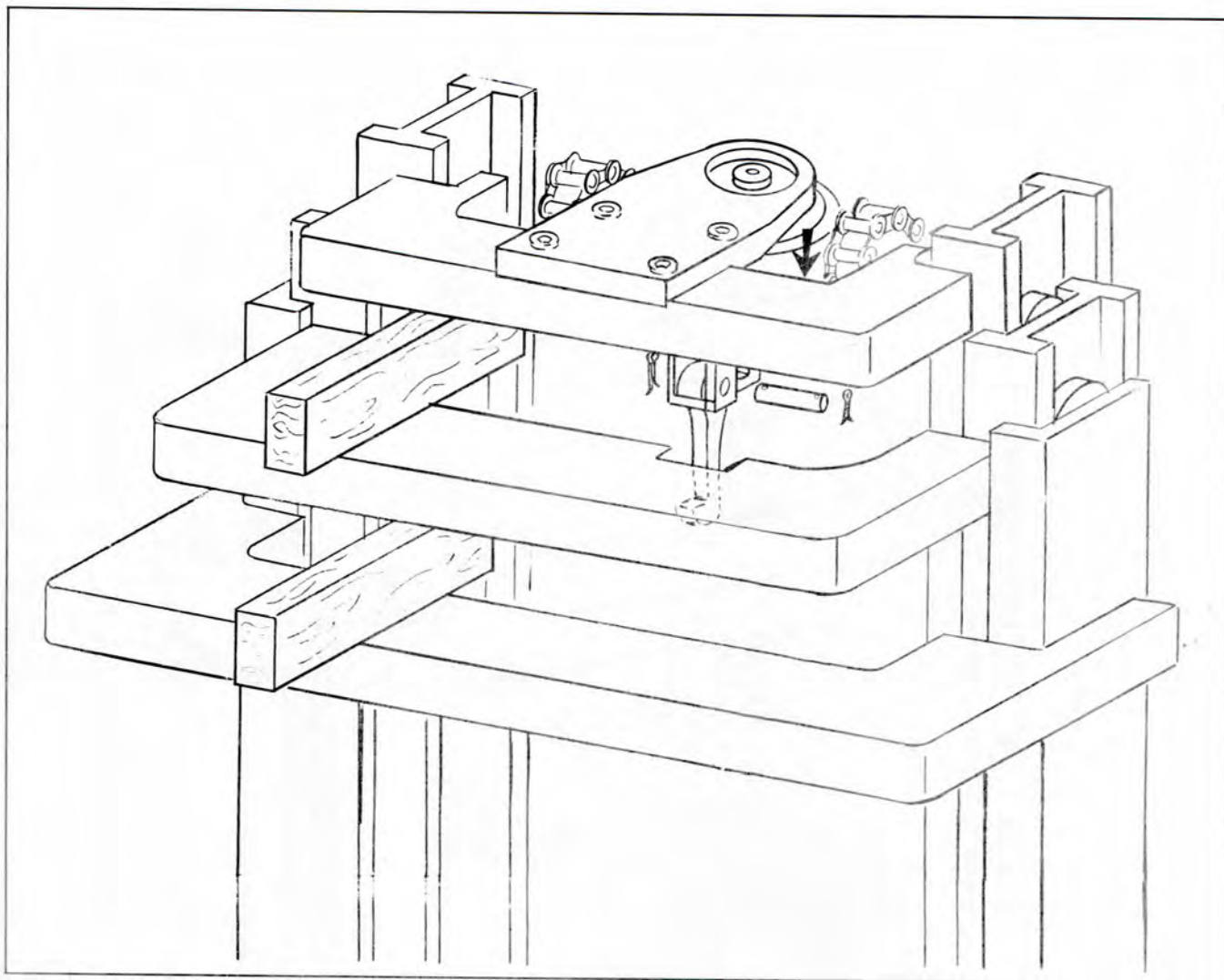


Plate 9659 Safety Stop

Step 17. Pull piston head down.

Install mechanical safety stop.

Replace cotter keys.

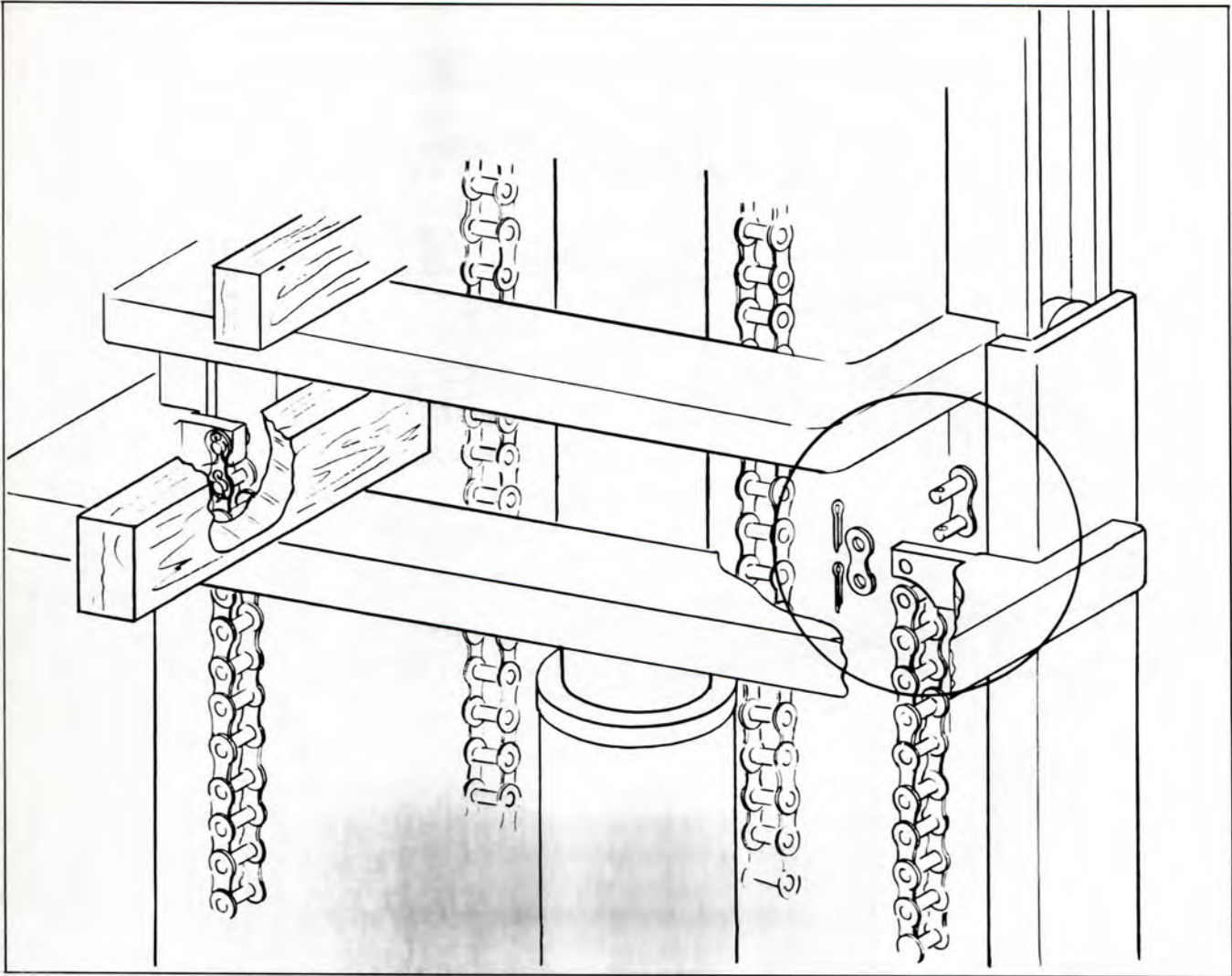


Plate 9660 Replacing Rear Lift Chains

Step 18. Install rear lift chains.

Check chain tension for adjustment. If adjustment is necessary be sure to secure adjusting nuts before operating machine.



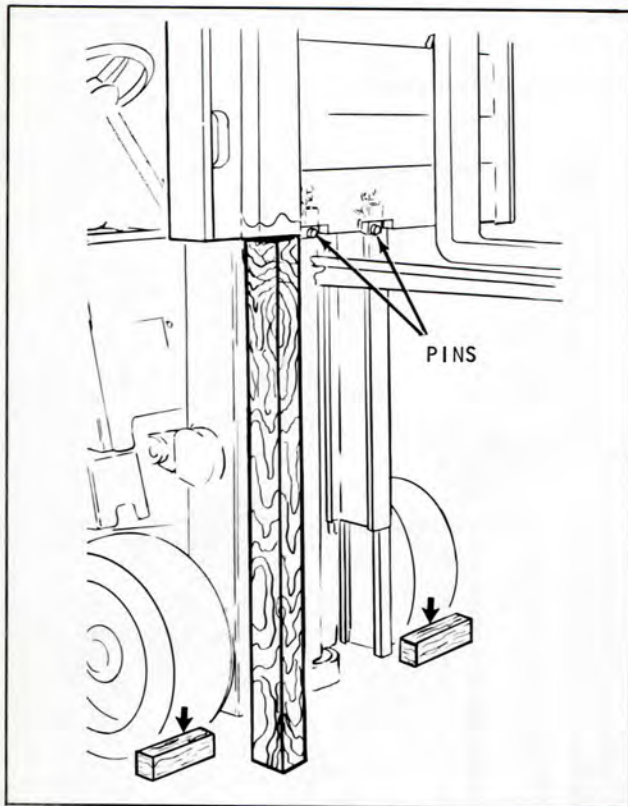


Plate 9593 Carriage Pin Replacement

Step 2. Remove anchor pins and replace with 3/8" x 2" bolts. FOR SAFETY REASONS, REMOVE ONLY ONE PIN AT A TIME. This will make pin removal easier when carriage is lowered.

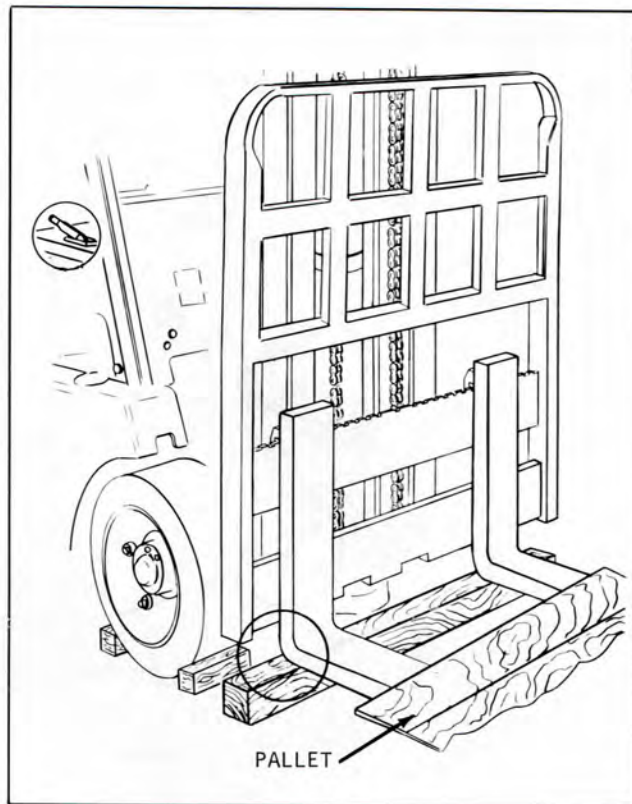


Plate 9560 Fork and Carriage Blocking

Step 3. Raise carriage off beam. Place beam on floor so, when lowered, the heel of the fork will rest on it as shown.

Step 4. Tilt upright full forward.



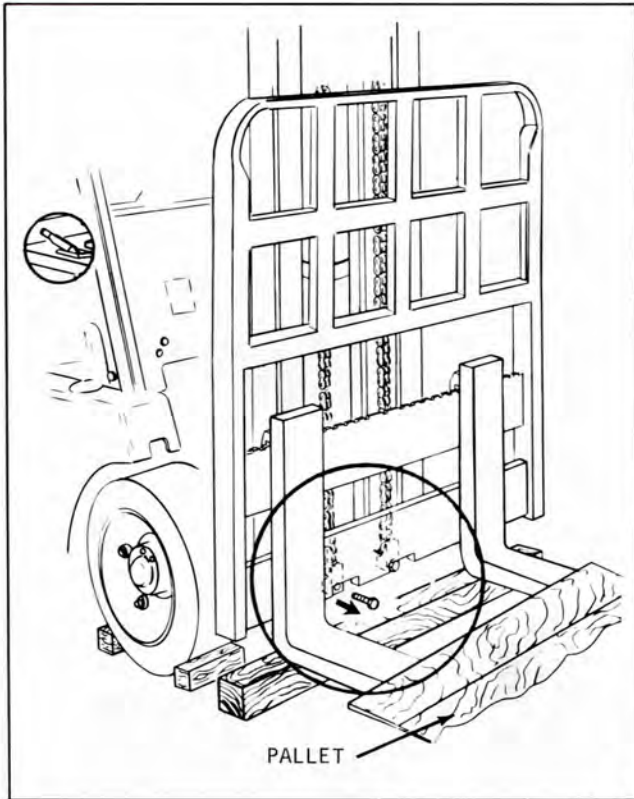


Plate 9561 Removing Bolts

Step 5. Remove 3/8" x 2" bolts. Place pallet on fork ends.

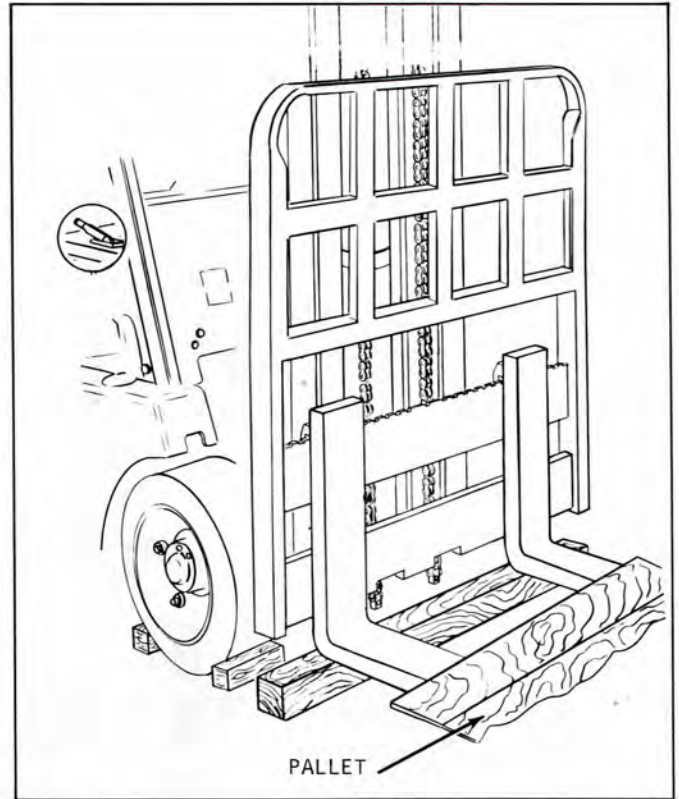


Plate 9562 Removing Chains From Anchors

Step 6. Pull chains out of carriage anchor brackets.

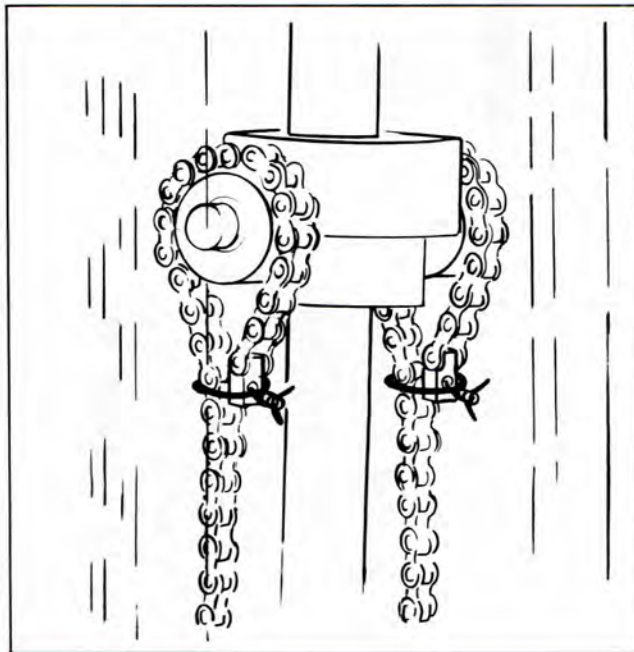


Plate 9563 Securing Chains (Typical)

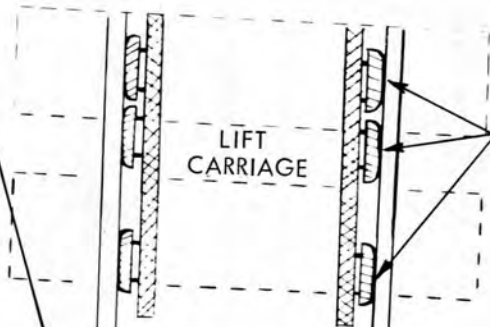
Step 7. Wire chains around chain sheaves as shown

**NOTE**

Use the same method on all cylinders.

**OUTER RAIL ROLLERS**

SHOULD BE CHECKED FOR ROLLER CLEARANCE THE FULL LENGTH OF THE INNER SLIDE RAIL.



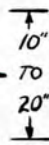
**LIFT CARRIAGE ROLLERS**

SHOULD BE CHECKED FOR ROLLER CLEARANCE THE FULL LENGTH OF THE INNER SLIDE RAIL.

**CHECK INNER SLIDE**

**BOTTOM ROLLER**

IN THIS 10 TO 20 INCH SECTION OF THE OUTER RAIL.



**INNER SLIDE ASSEMBLY**

**NOTE**

ROLLER CLEARANCE SHOULD NOT EXCEED 1/32 INCH.

**OUTER RAIL ASSEMBLY**

**OUTER RAIL ROLLERS**

SHOULD BE CHECKED FOR ROLLER CLEARANCE THE FULL LENGTH OF THE INNER SLIDE RAIL.

**NOTE**

IF UPRIGHT RAILS ARE COCKED IN POSITION AS SHOWN, AND IF CLEARANCE IS CHECKED ON THIS SIDE, CLEARANCE IS MEASURED BETWEEN THE UPPER EDGE

OF THE ROLLER RIM AND CORRESPONDING RAIL.

**NOTE**

IF UPRIGHT RAILS ARE COCKED IN POSITION AS SHOWN, AND IF CLEARANCE IS CHECKED ON THIS SIDE, CLEARANCE IS MEASURED BETWEEN THE LOWER EDGE

OF THE ROLLER RIM AND CORRESPONDING RAIL.

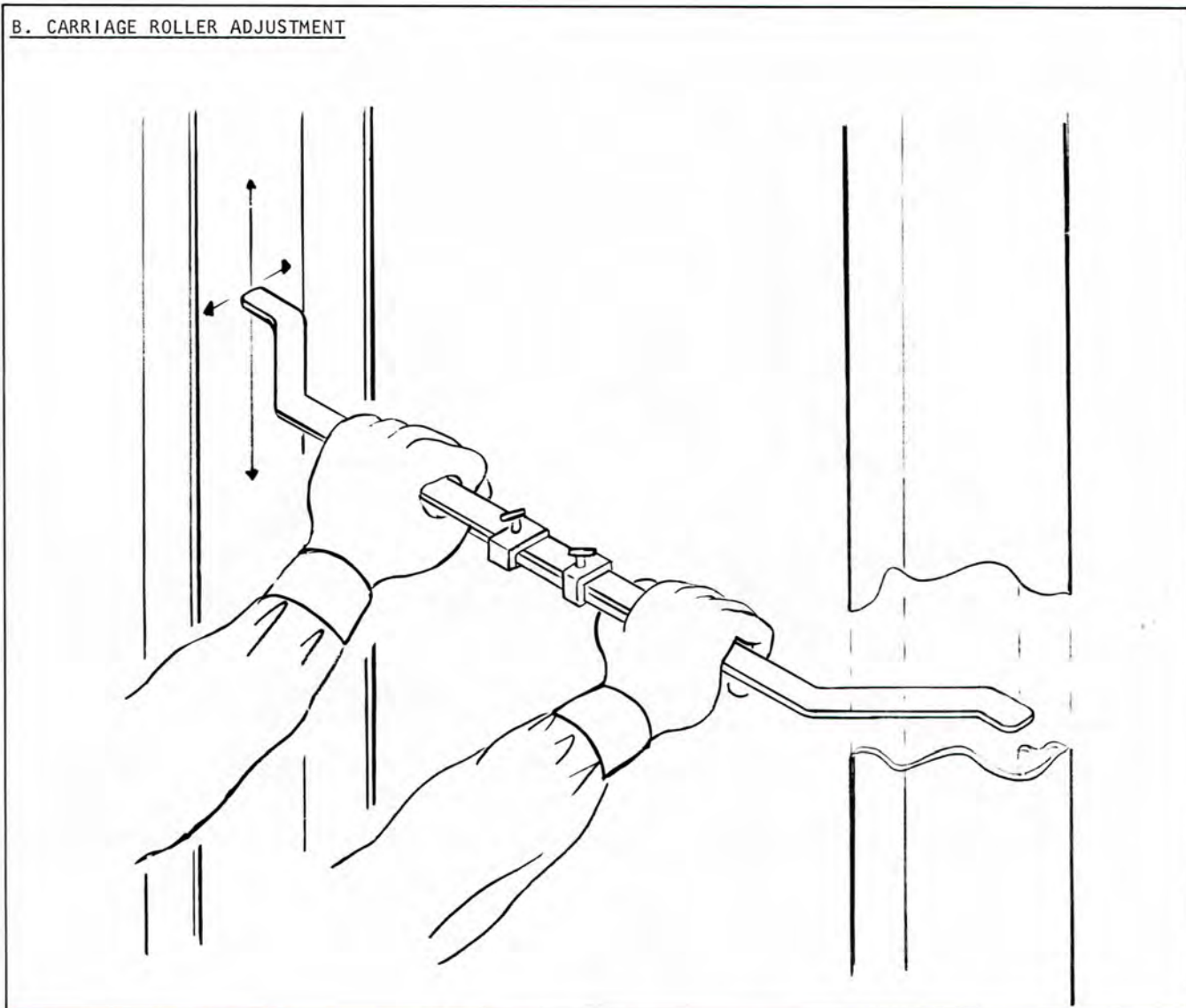
**B. CARRIAGE ROLLER ADJUSTMENT**

Plate 9567 Spanning Inner Rail

Step 1. Span inner rail with inside spanning tool to find the smallest distance between the rails. Lock tool in position.

**N O T E****FOR SIX ROLLER CARRIAGE ONLY**

After finding the smallest distance between rails, place a shim between the spanning tool and the inner rail, then lock spanning tool in position.

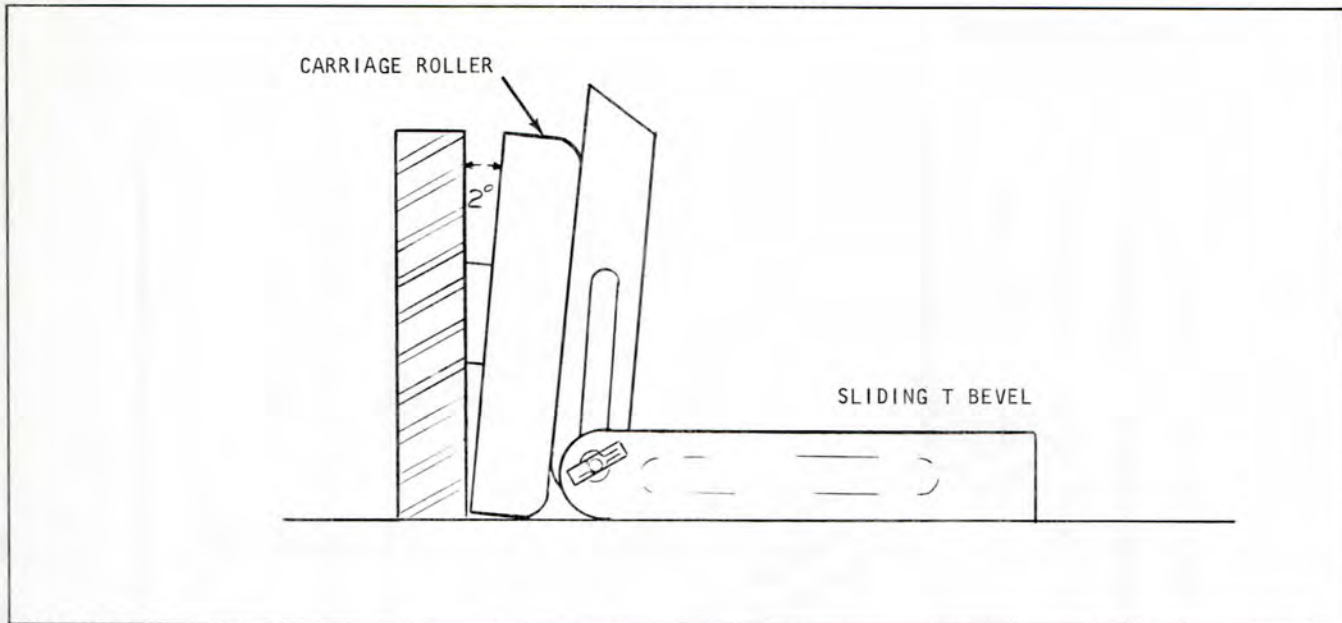


Plate 9589 Setting T Bevel

## NOTE

Check angle of carriage rollers. Roller pin bosses are welded at  $2^{\circ} \pm 1/2^{\circ}$  and if damaged, replace carriage roller pin boss assembly. To obtain this, contact Central Parts.

To check roller angle use a Sliding T Bevel and Protractor. Lay one side against roller surface and lock in place.

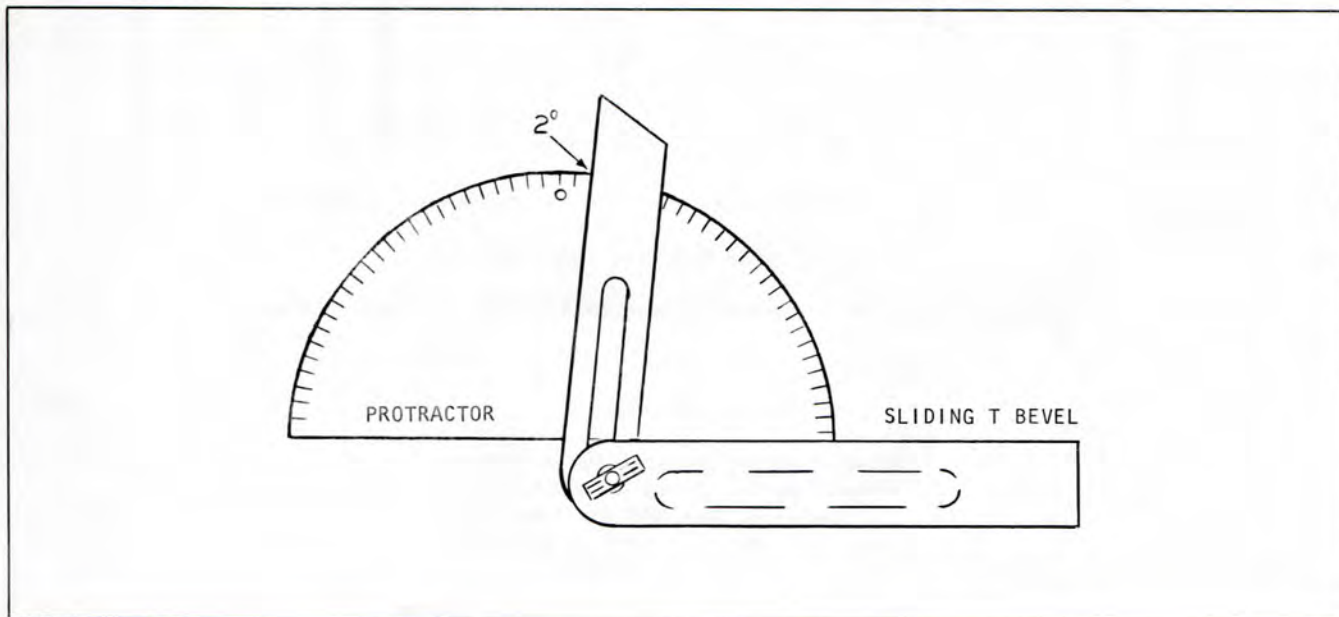


Plate 9590 Checking Roller Angle

Determine degree of angle by placing Protractor on Sliding T Bevel.

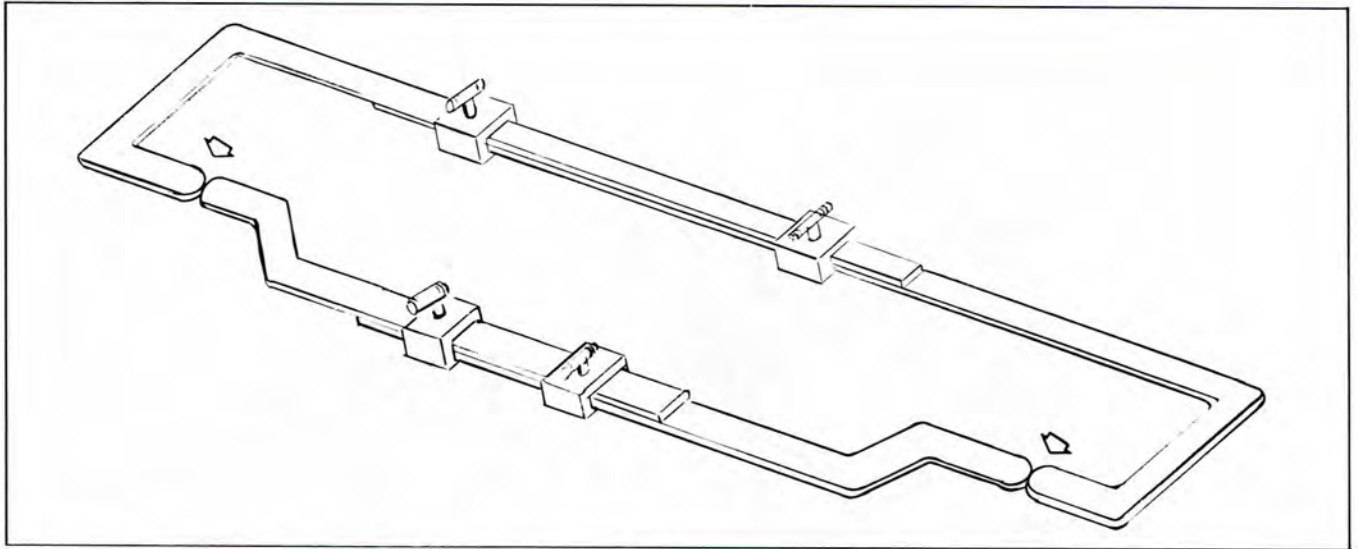


Plate 9568 Setting Outside Spanning Tool

Step 2. Set outside spanning tool to match inside spanning tool. Lock tool in position.

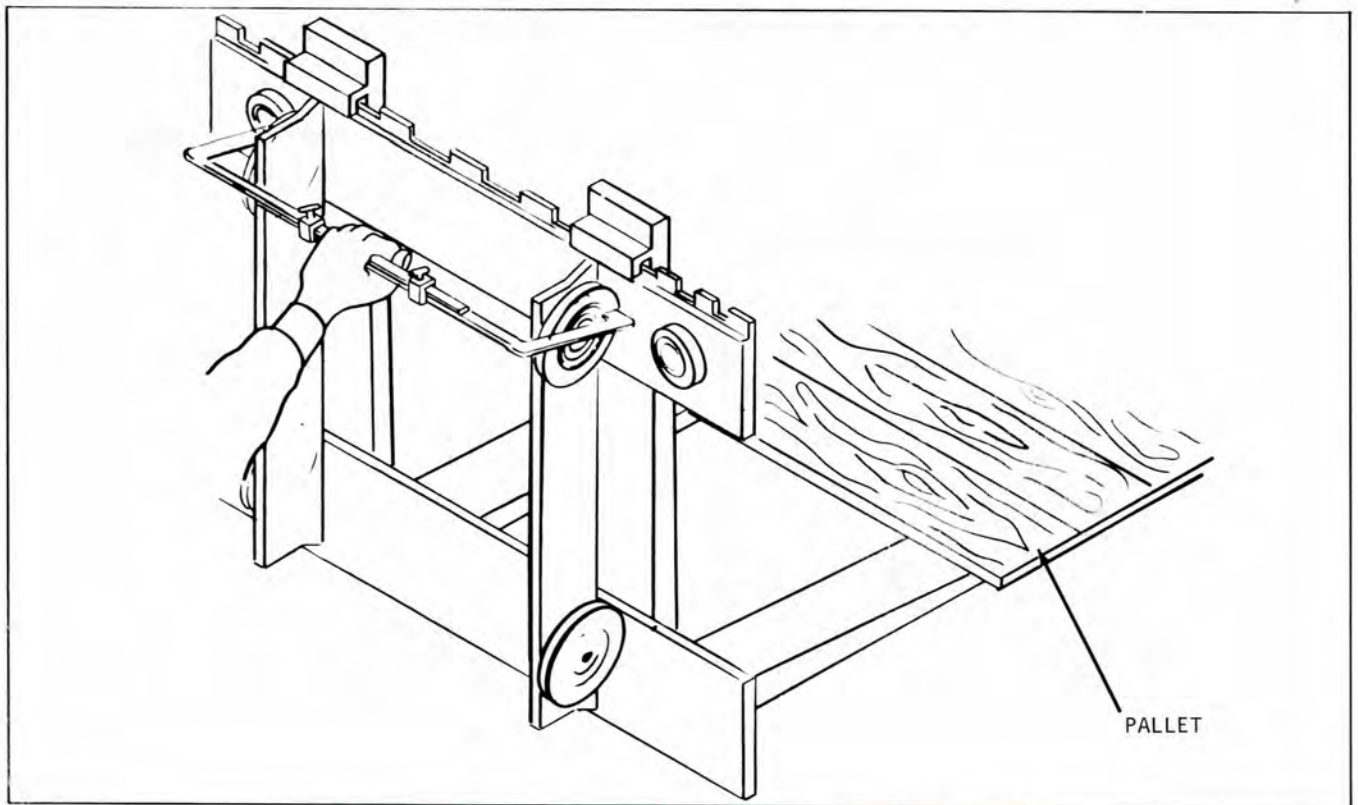


Plate 9569 Spanning Upper Rollers (Four Roller Carriage)

Step 3. Span upper carriage rollers at their outer most camber point. Add or subtract ...

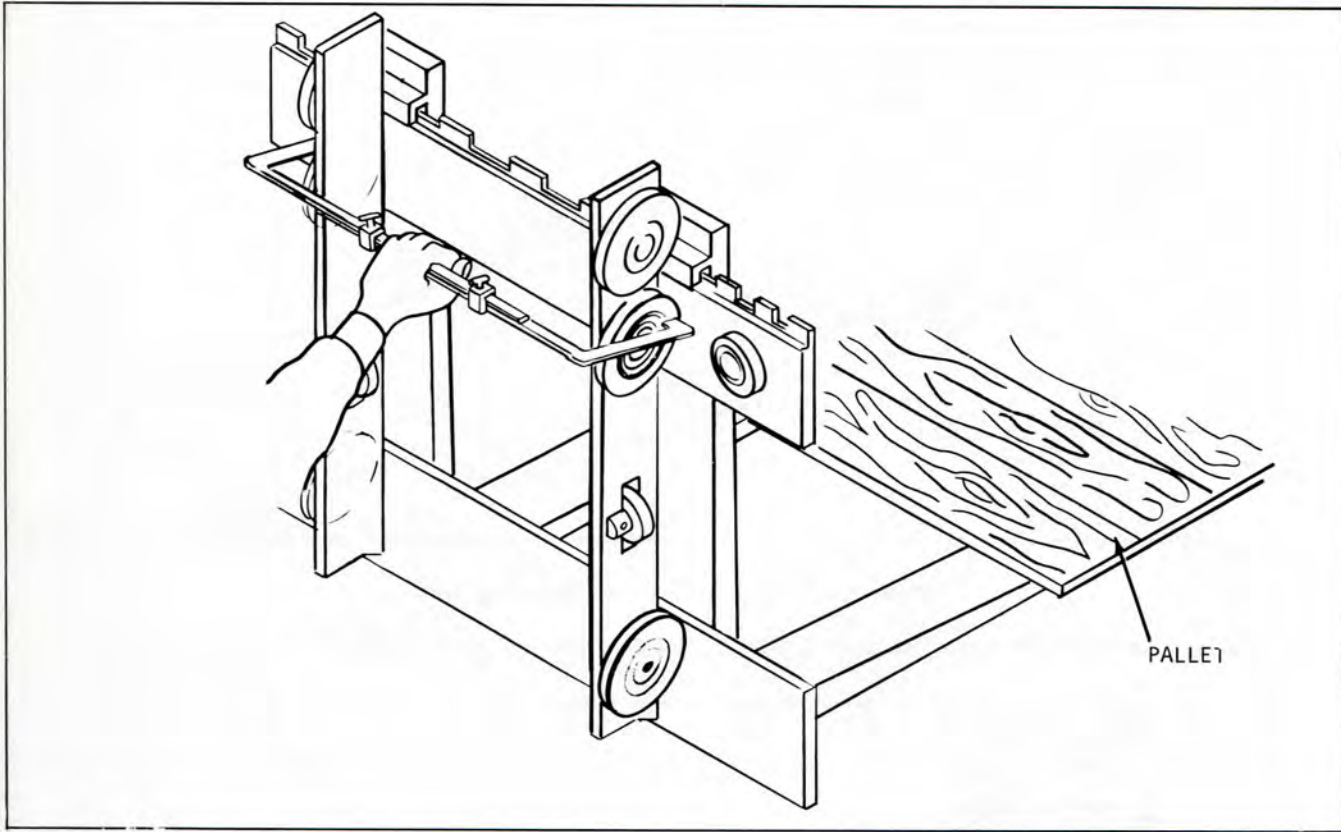


Plate 9570 Spanning Upper Rollers (Six Roller Carriage)

...shims at roller shaft to reach tool size.

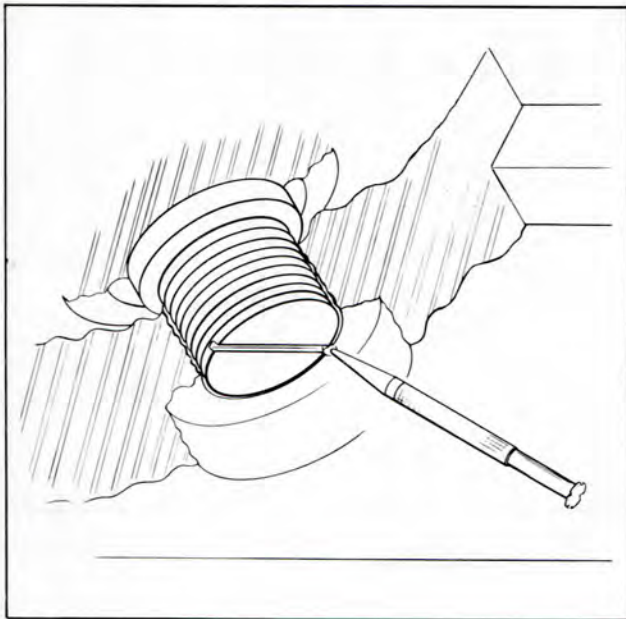


Plate 9571 Securing Outer Thrust Roller

**N O T E**

Before centering carriage rollers check outer thrust rollers for security and condition of bearings. If loose tighten and stake. If worn replace.

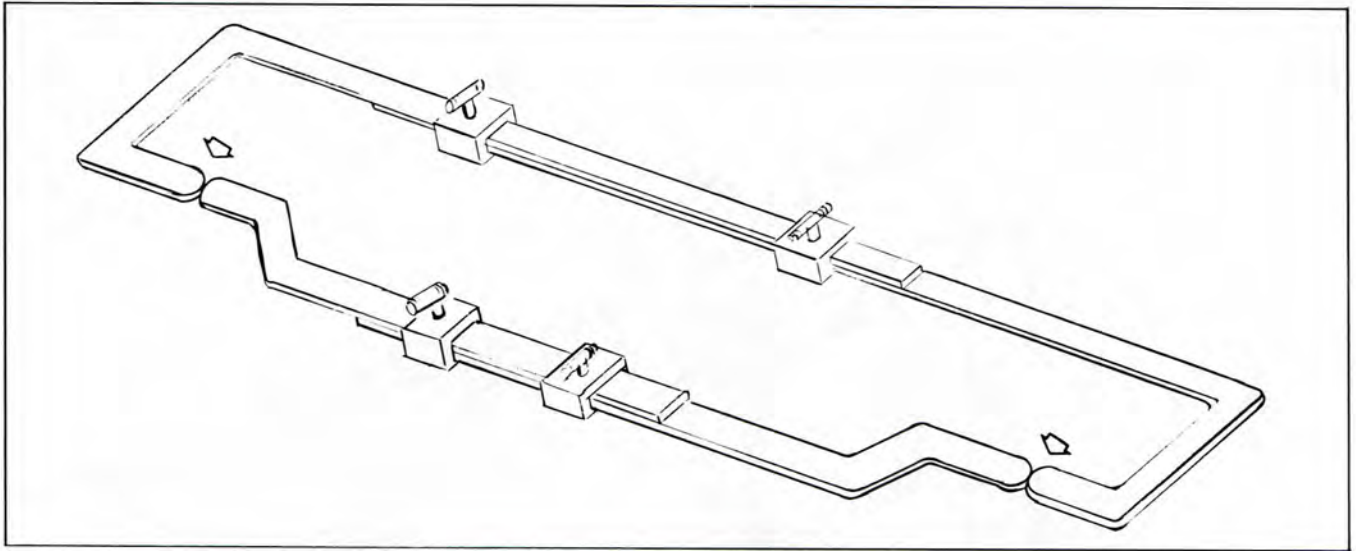


Plate 9568 Setting Outside Spanning Tool

Step 2. Set outside spanning tool to match inside spanning tool. Lock tool in position.

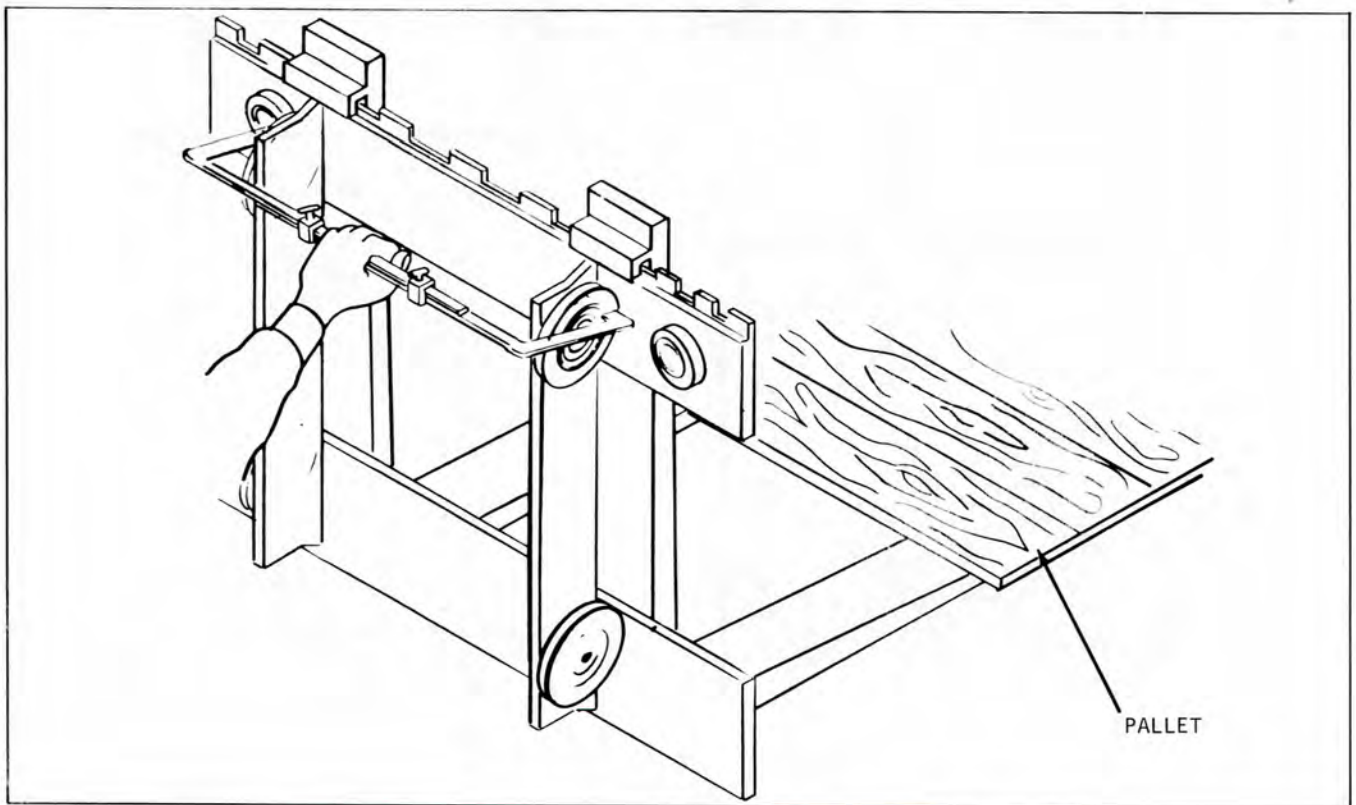


Plate 9569 Spanning Upper Rollers (Four Roller Carriage)

Step 3. Span upper carriage rollers at their outer most camber point. Add or subtract ...

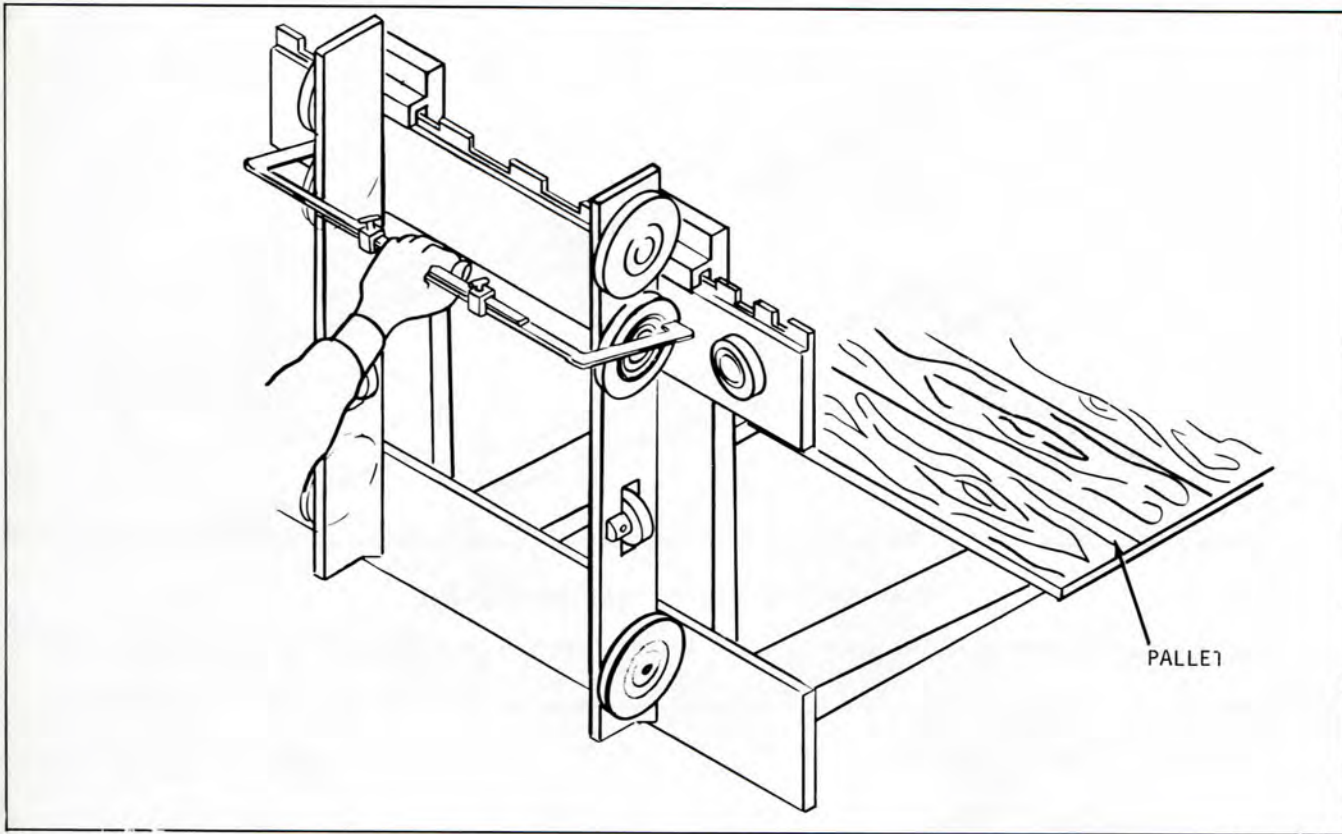
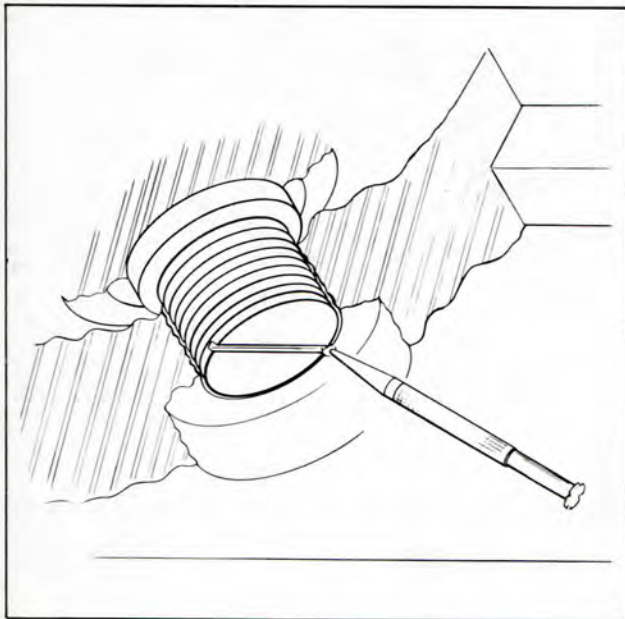


Plate 9570 Spanning Upper Rollers (Six Roller Carriage)

...shims at roller shaft to reach tool size.



**NOTE**

Before centering carriage rollers check outer thrust rollers for security and condition of bearings. If loose tighten and stake. If worn replace.

Plate 9571 Securing Outer Thrust Roller



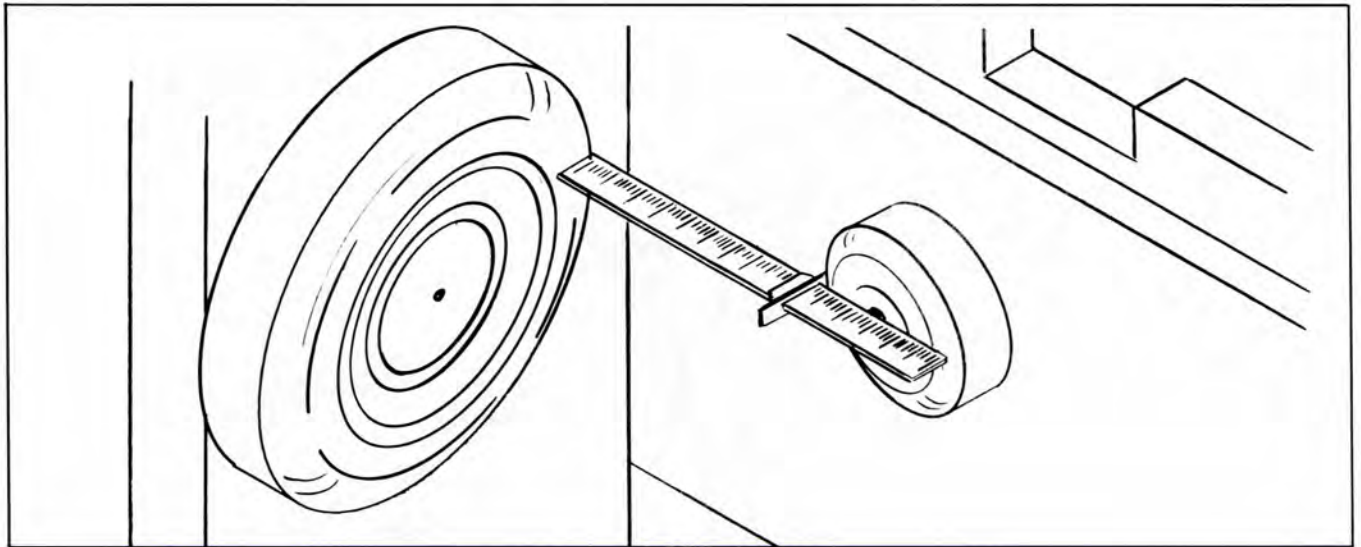


Plate 9572 Centering Carriage Rollers

Step 4. Center carriage rollers within outer thrust rollers by placing 6" scale on the carriage roller surface and measuring the distance to the outer thrust roller face. Add or subtract shims from one roller to the other to make measurement equal.

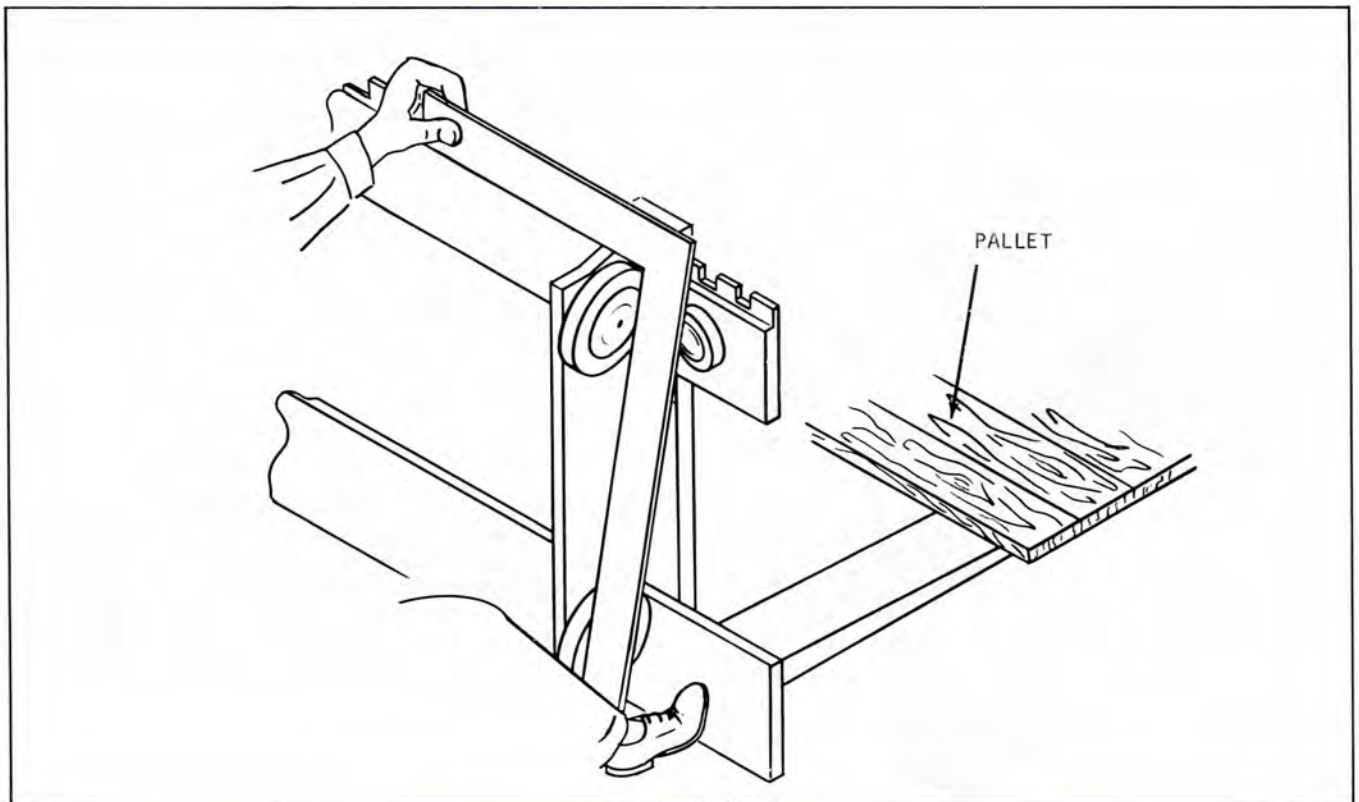


Plate 9573 Squaring Carriage Rollers (Four Roller Carriage)

Step 5. Square carriage rollers by placing carpenter's square at the outer most camber of the ...

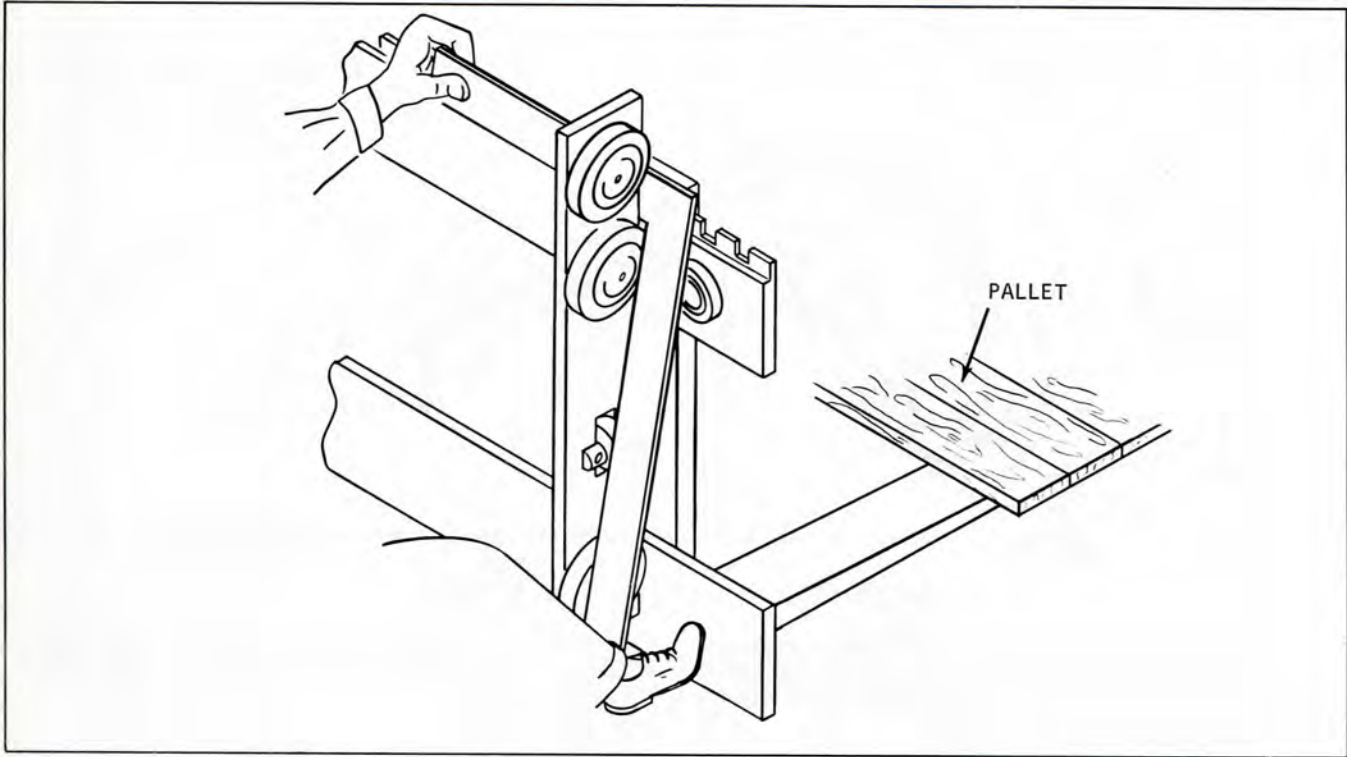
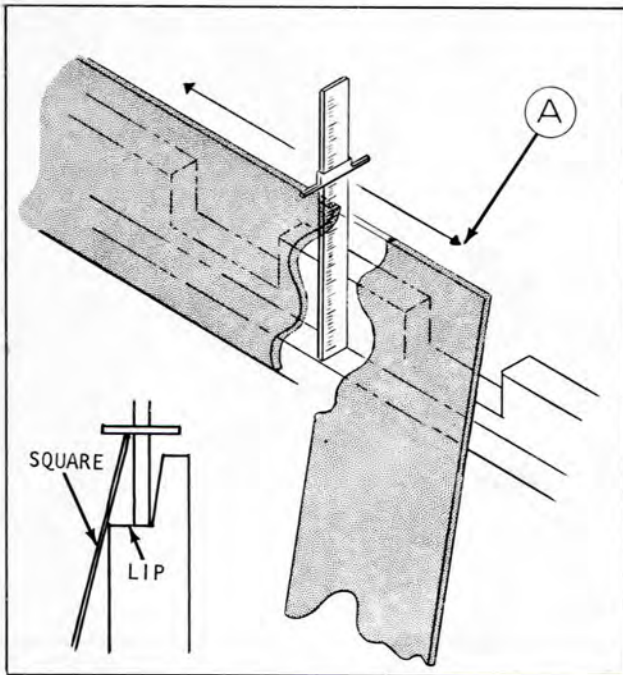


Plate 9574 Squaring Carriage Rollers (Six Roller Carriage)

... upper and lower rollers. Hold square in place with ankle and hand as shown.



Step 6. Hold square and measure the distance between the top face (or lip) of the upper fork bar to the edge of the square at Point A. Now take a measurement at opposite end of square ... these measurements should be the same. If they are not, add or remove shims on lower roller shaft until distance measured at each end is equal.

Plate 9575 Measuring For Squareness

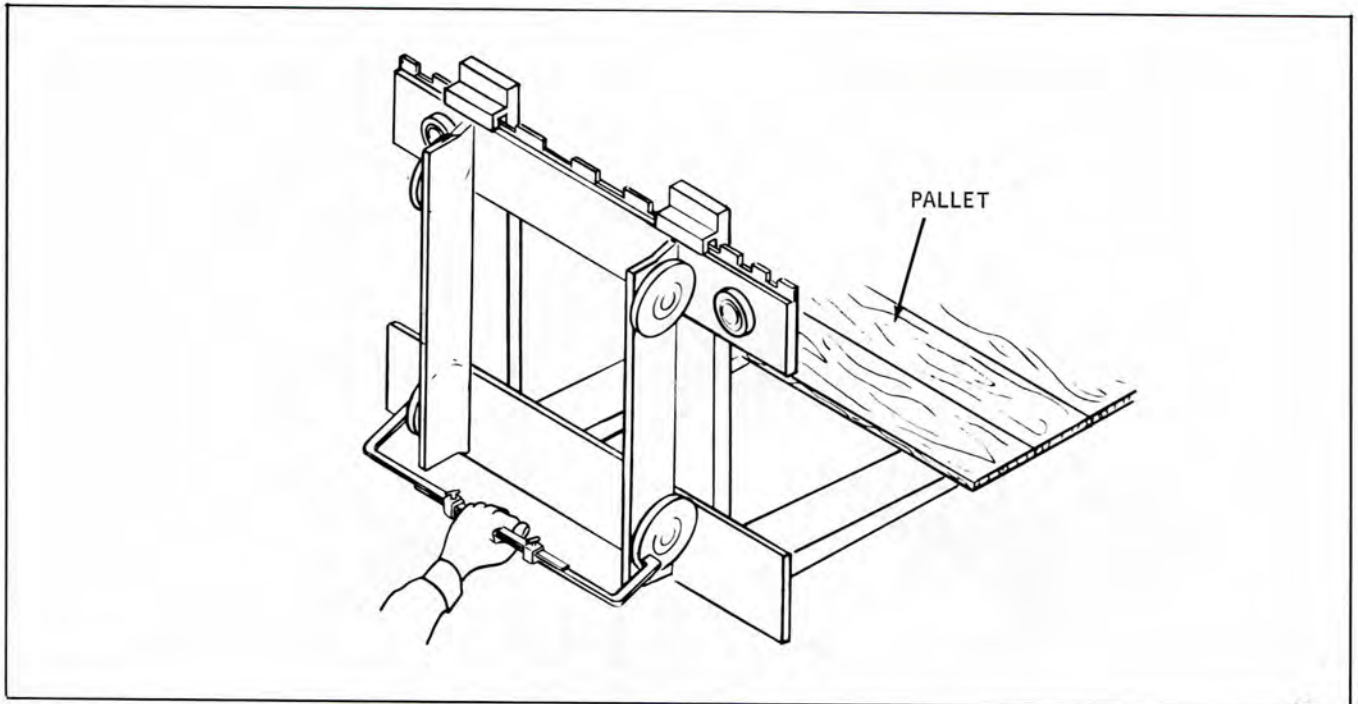


Plate 9576 Spanning Lower Rollers (Four Roller Carriage)

Step 7. Span lower rollers. Add or subtract shims to (the roller that has not been squared) ...

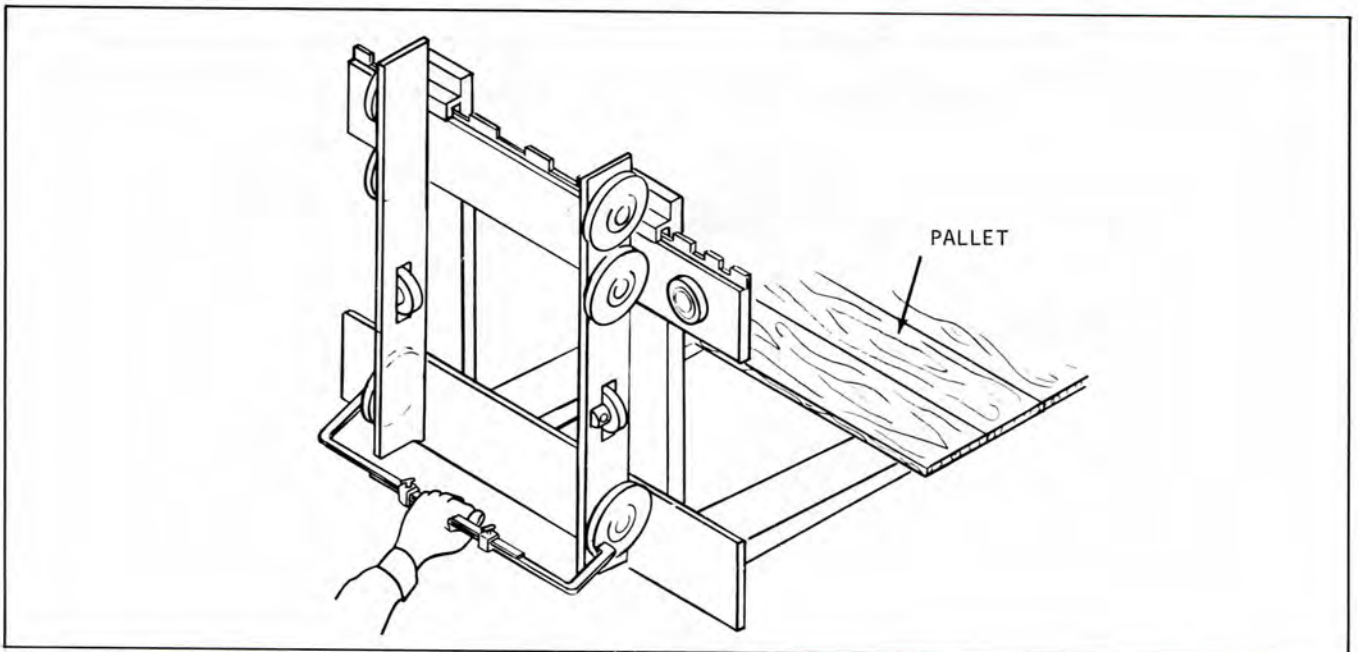


Plate 9577 Spanning Lower Rollers (Six Roller Carriage)

... reach the size of the outside spanning tool.

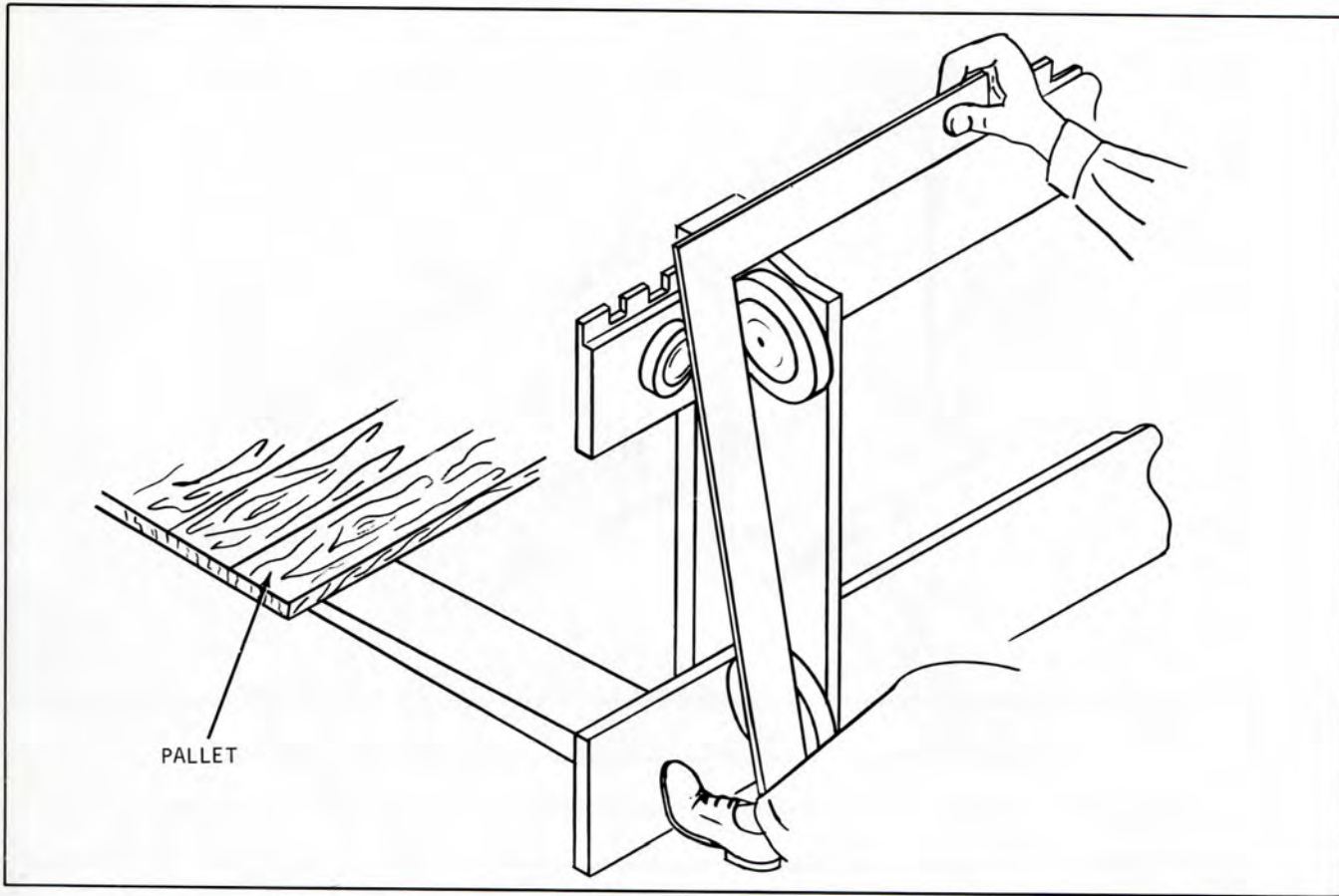


Plate 9578 Checking Squareness (Four Roller Carriage)

Step 8. Check opposite side for squareness (by holding square in the same manner as before and checking ...

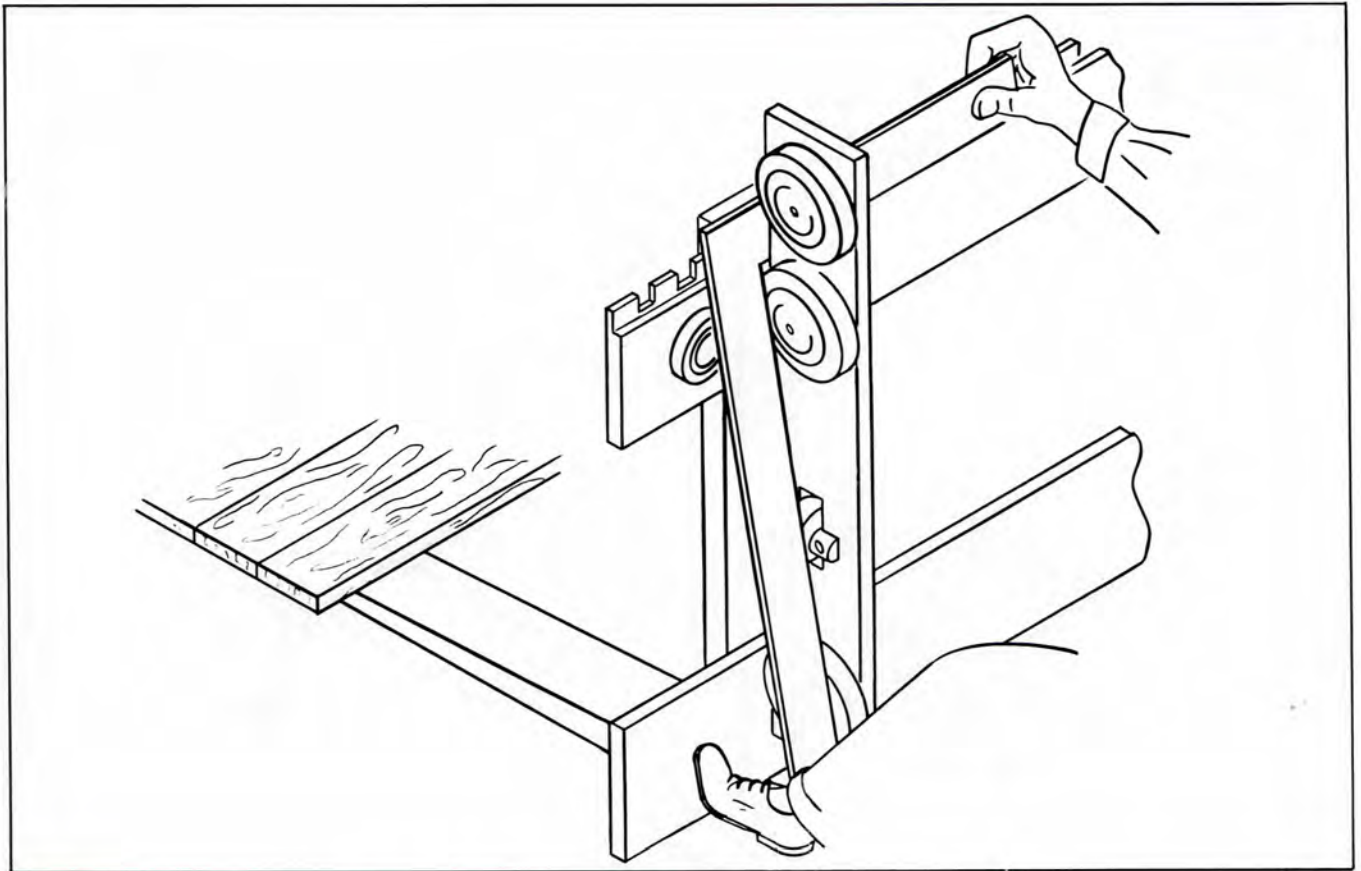


Plate 9579 Checking Squareness (Six Roller Carriage)

... measurement). This side will be square within  $1/32$ " ; if not, return to Step 5. and repeat procedure.

SIX ROLLER CARRIAGE ONLY

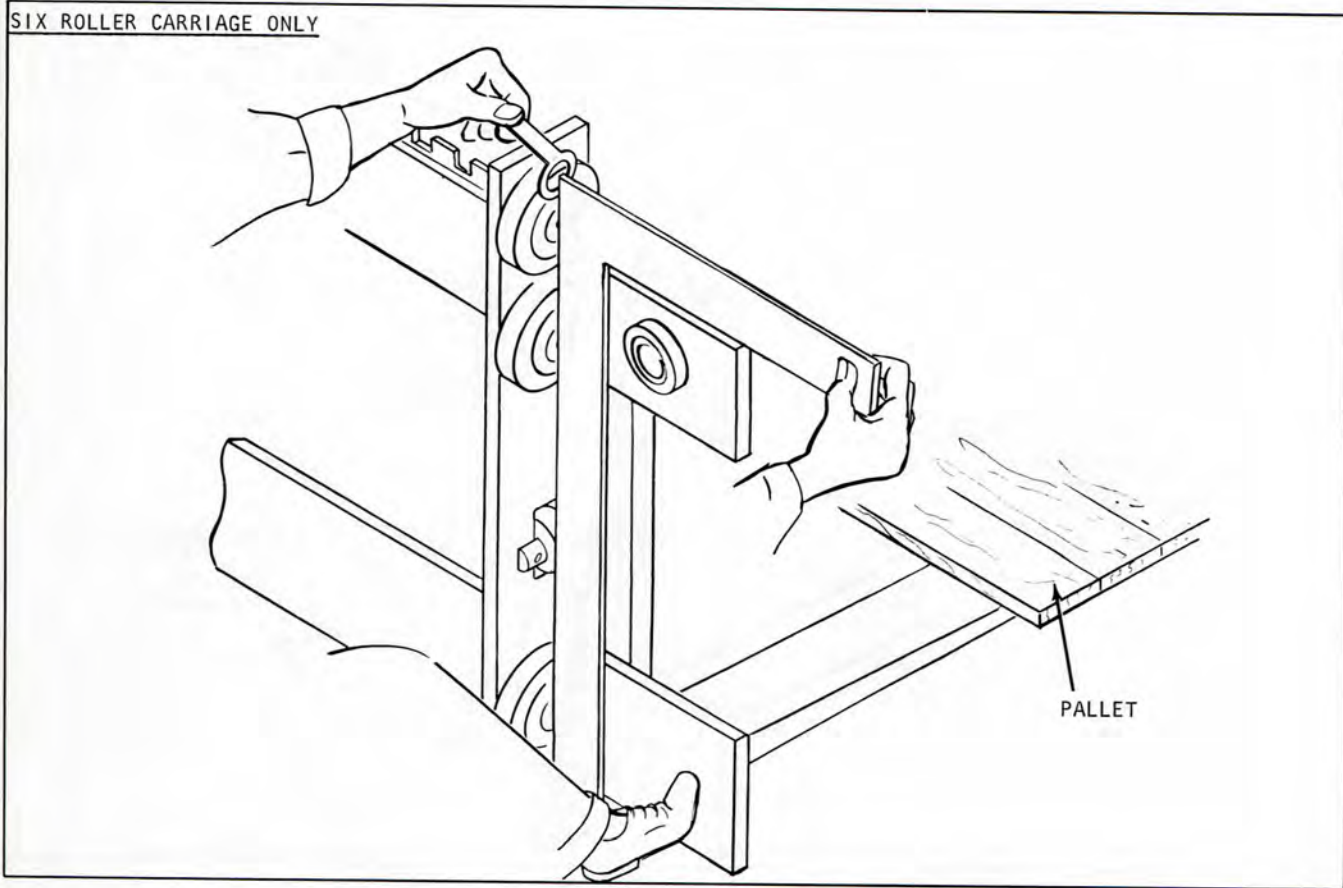


Plate 9580 Top Roller Clearance

Step 1. Place square on the vertical center line of the carriage rollers, as shown above. There must be some clearance between the square and the side surface of the top roller. This clearance should not exceed 1/32" or one shim

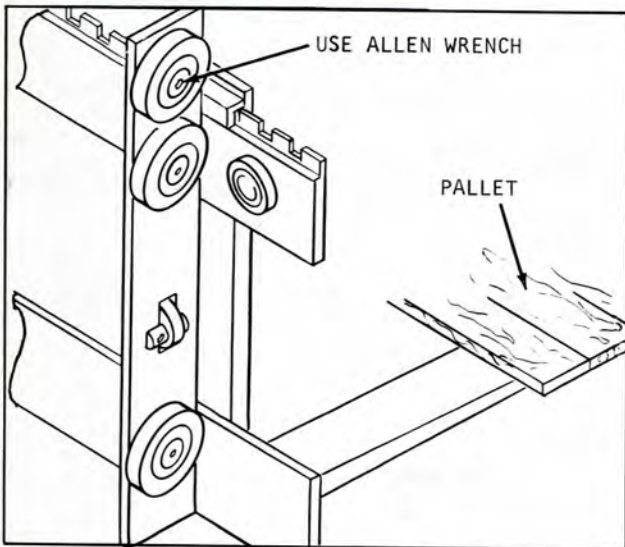


Plate 9581 Removing Top Roller

Step 2. If adjustment is necessary, remove allen screw, lock washer and flat washer to add or remove shims on shaft. Tighten screw securely after completing adjustment.

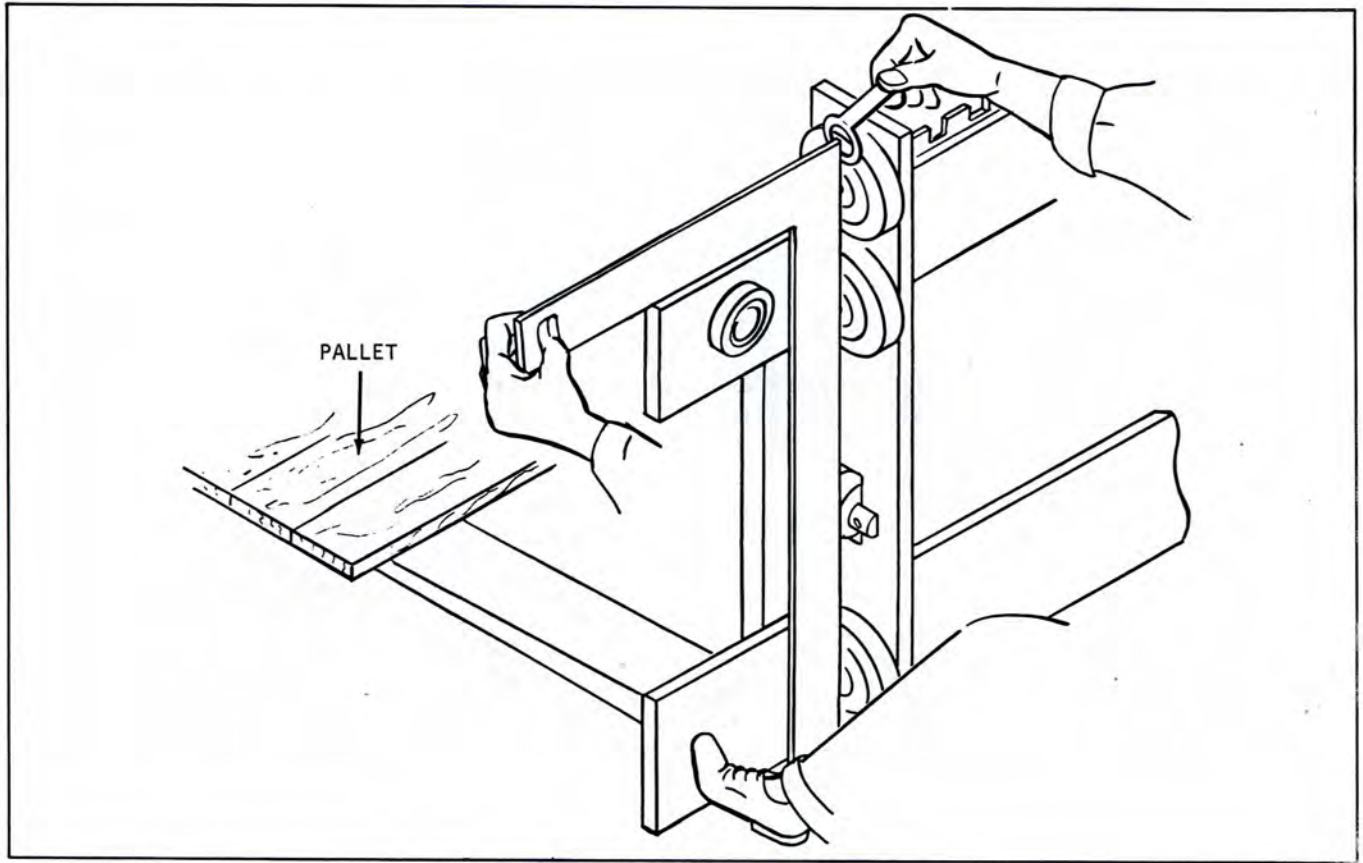


Plate 9582 Top Roller Clearance

Step 3. Check opposite upper roller in the same manner; adjust if necessary.

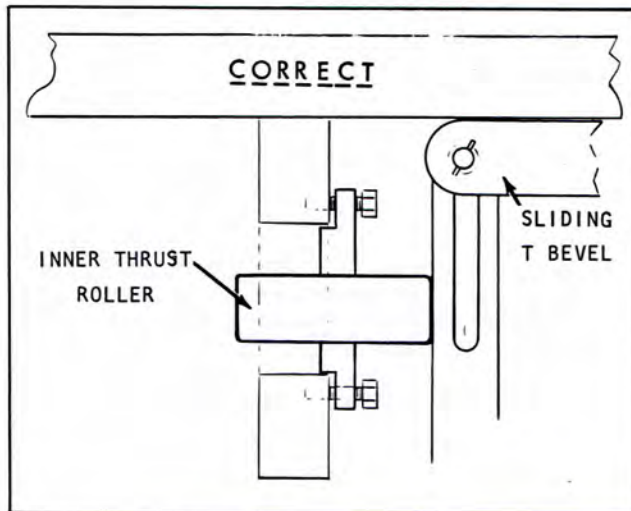


Plate 9583 Checking Squareness ■ CORRECT

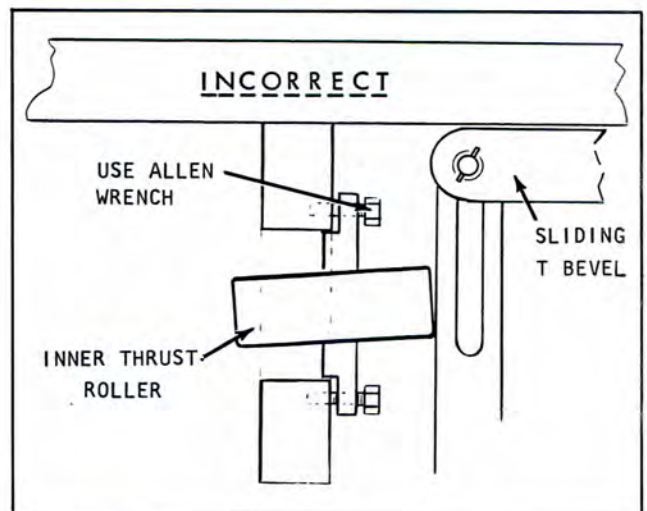


Plate 9584 Checking Squareness ■ INCORRECT

Step 4. Check squareness of inner thrust rollers with Sliding T Bevel. Set Sliding T Bevel to 90° using carpenter's square.

Step 5. Add or subtract shims for adjustment (Use allen wrench see Plate 9584).

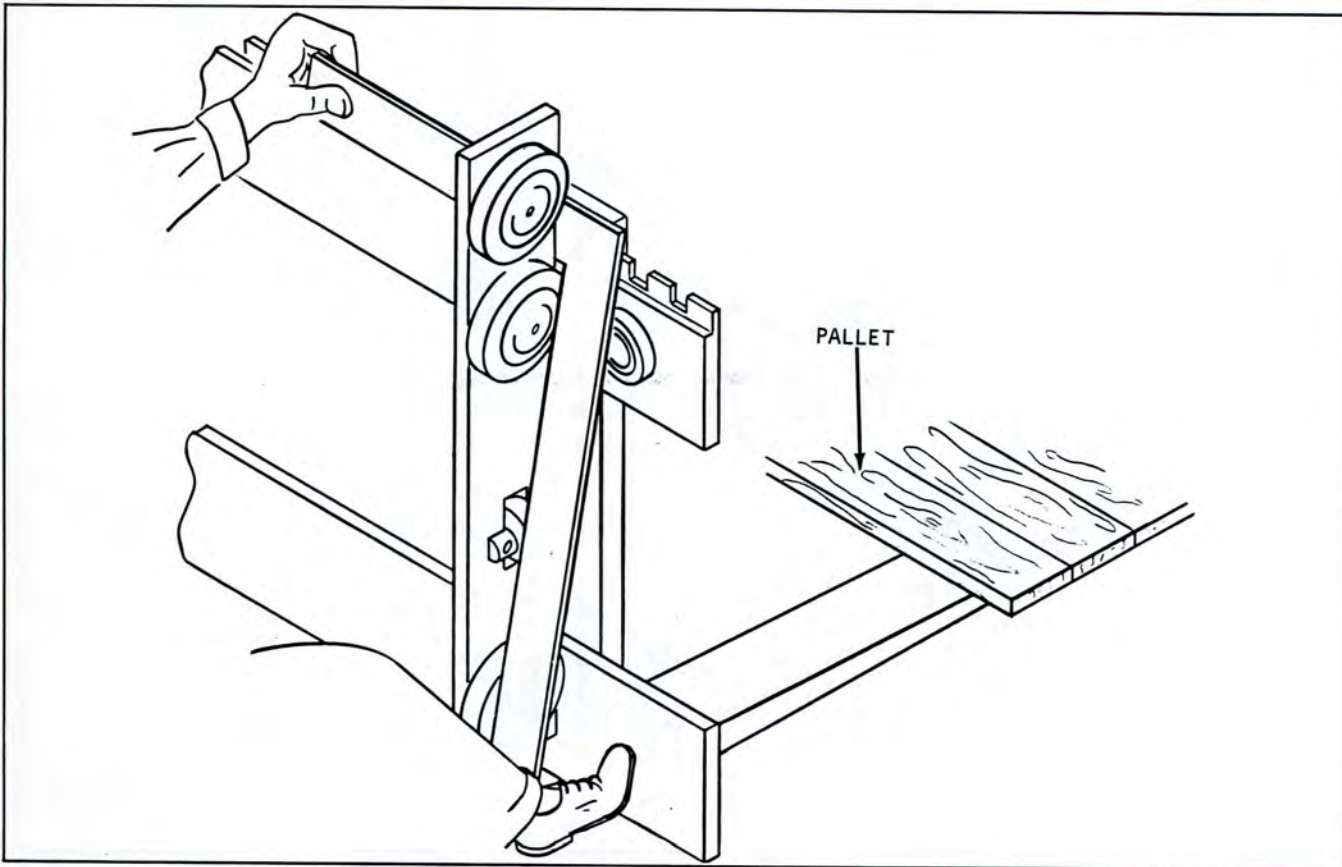


Plate 9574 Square And Side Thrust Roller

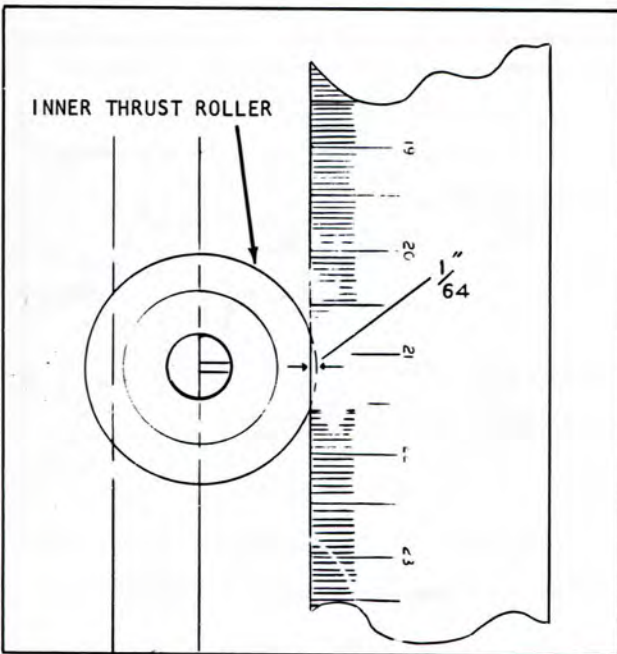


Plate 9585 Reading Roller Projection

Step 6. The inner thrust roller is to project  $1/64$ " past line of square. Use one thrust roller shim and eyeball distance as shown (Plate 9573 and Plate 9585).

Step 7. Repeat Step 6. on opposite side.



C. CARRIAGE INSTALLATION

## NOTE

Before installing carriage, check upright for proper shimming adjustment.

Step 1. Drive machine up to carriage and position upright to match tilt of carriage.

Step 2. Raise inner rails to just clear upper carriage rollers.

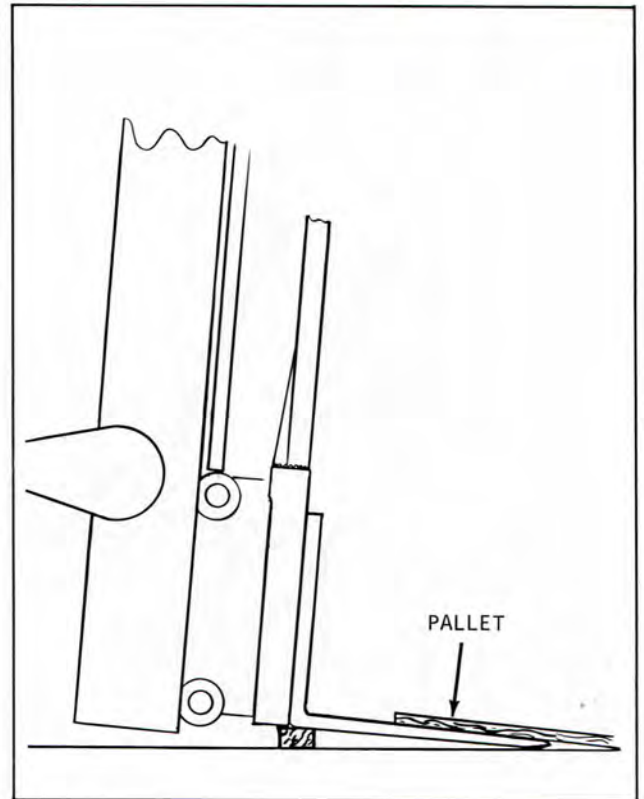


Plate 9565 Inner Rail Clearing Carriage Rollers

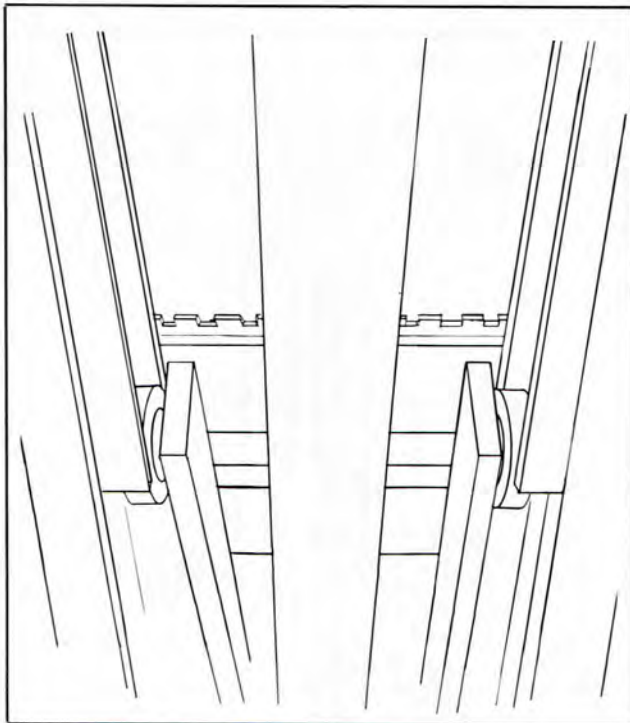


Plate 9591 Rollers Guiding Into Inner Rail

Step 3. Continue to drive machine forward until inner rails line up with upper carriage rollers, then... slowly lower inner rails to full down position.

CAUTION

CHECK TO BE SURE THE TOP CARRIAGE ROLLERS ARE GUIDING INTO INNER RAIL.

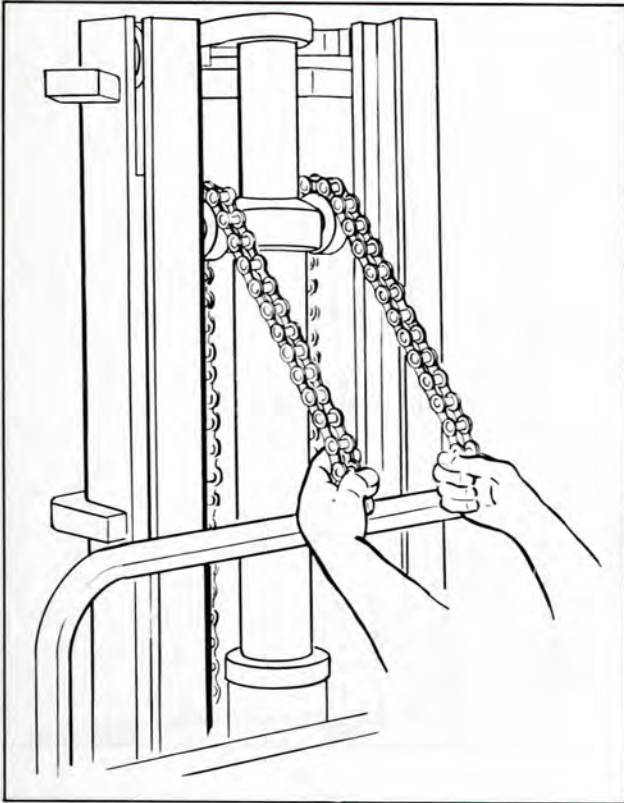


Plate 9586 Pulling Piston Head Down

Step 3(a). Remove wires holding lift chains.

(b). With a chain in each hand and someone holding the lift cylinder lever down, pull the piston to full down position. Place chains behind carriage.

Step 5. Raise carriage about 5' and place a 3' to 4' long 4"x4" wooden beam under it. DO NOT stand directly under forks. Lower carriage onto beam.

Step 6. Replace bolts with anchor pins.

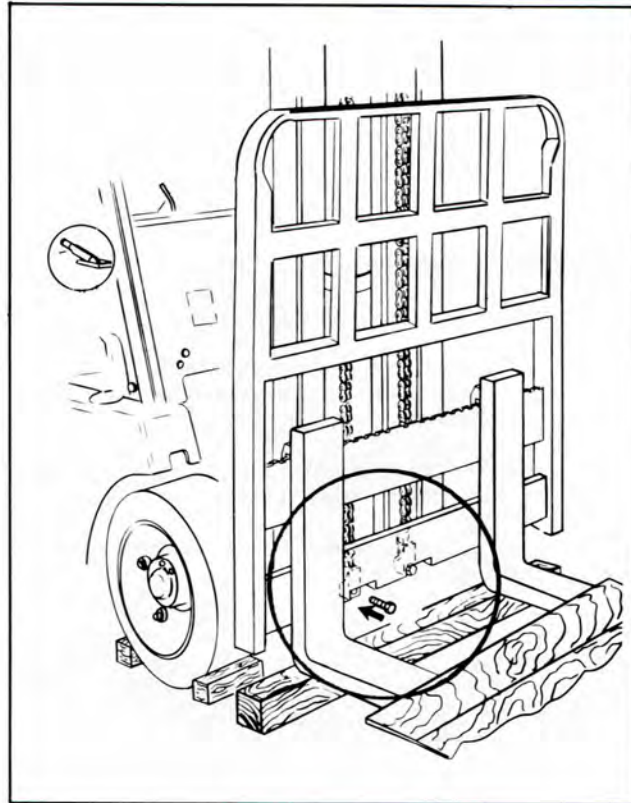


Plate 9587 Installing Bolts

Step 4. Put chain anchors in carriage anchor brackets and install 3/8" x 2" bolts in anchor pin holes.

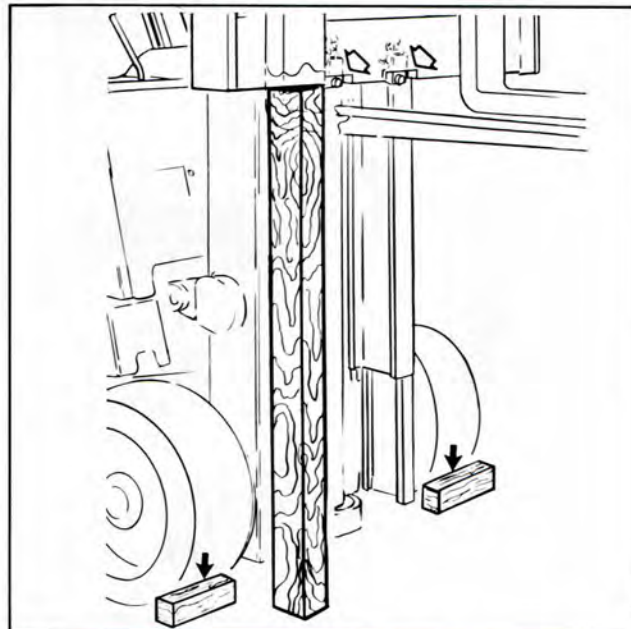


Plate 9593 Carriage Pin Replacement

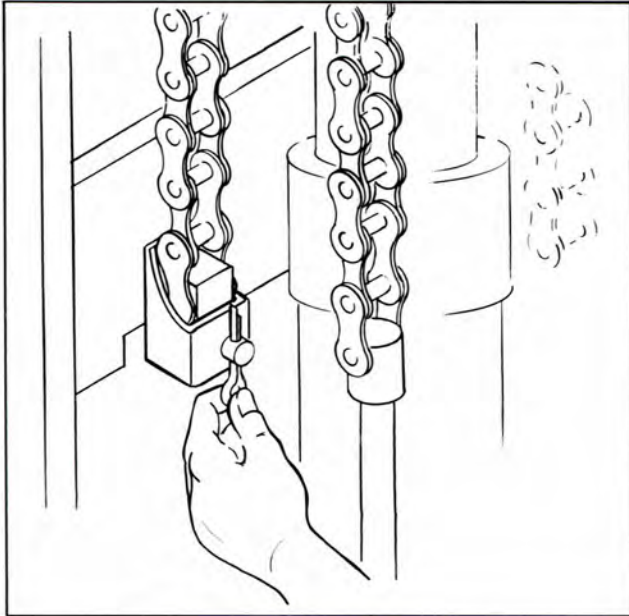
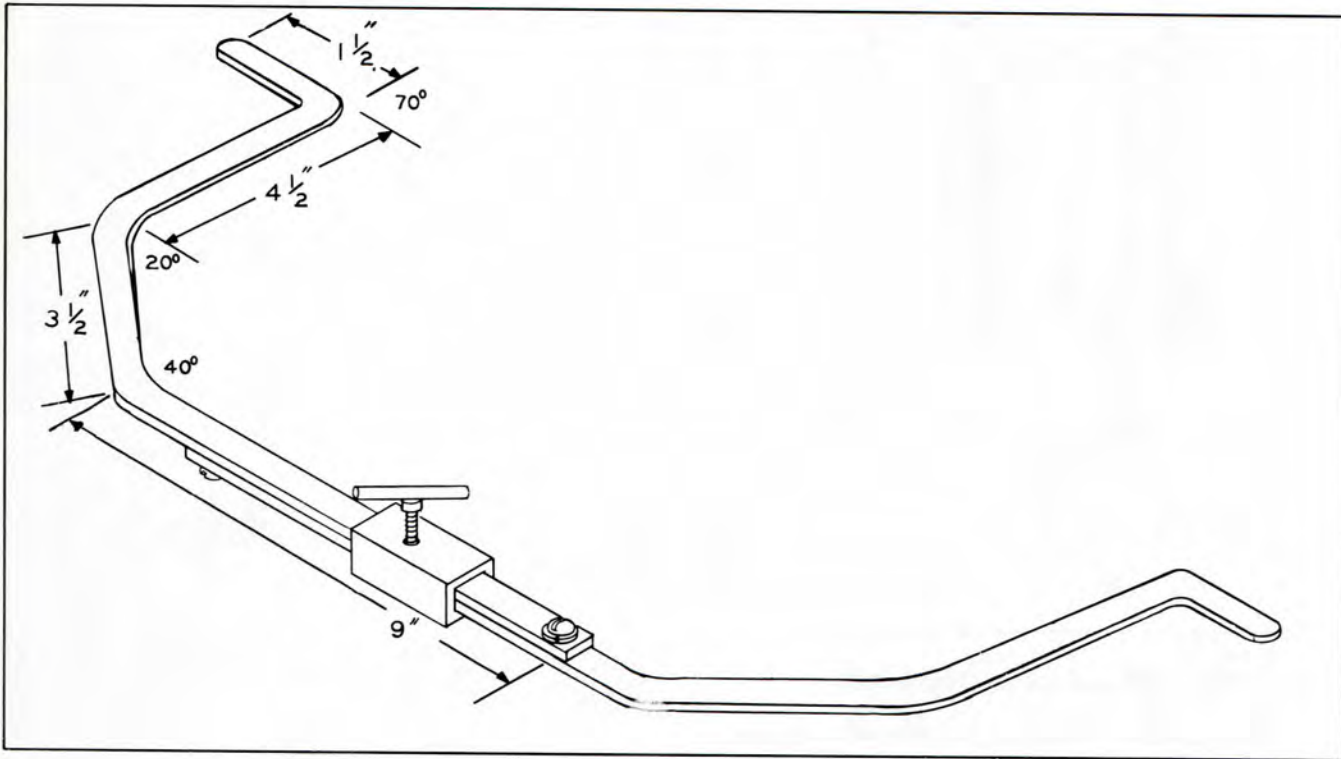


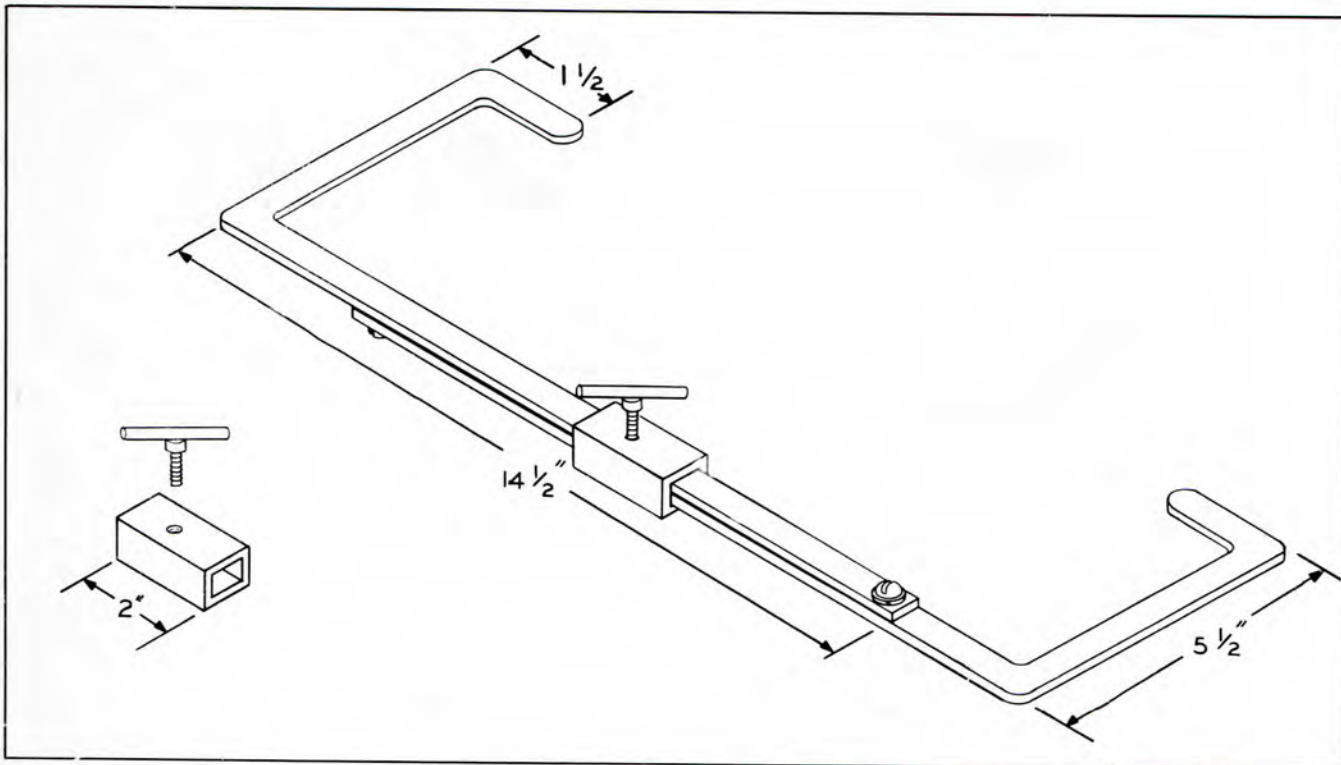
Plate 9588 Installing Cotter Pins

Step 7. Replace cotter pins in anchor pins.

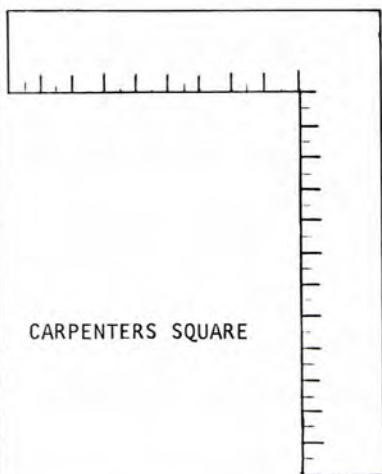
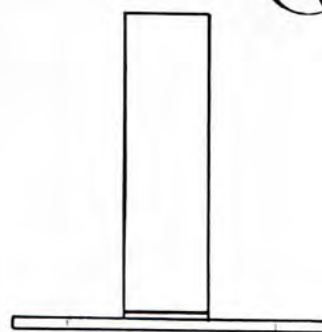
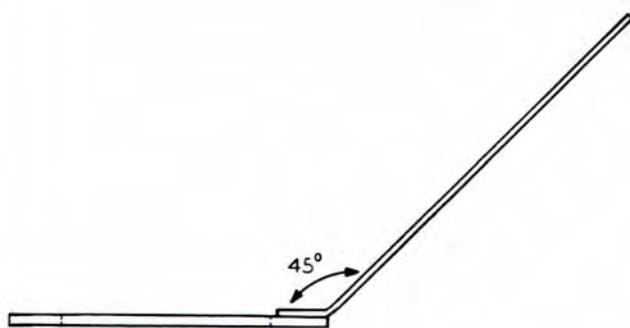
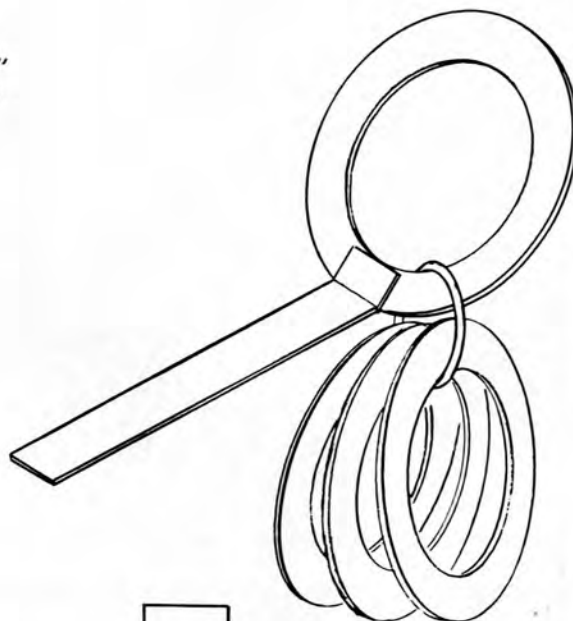
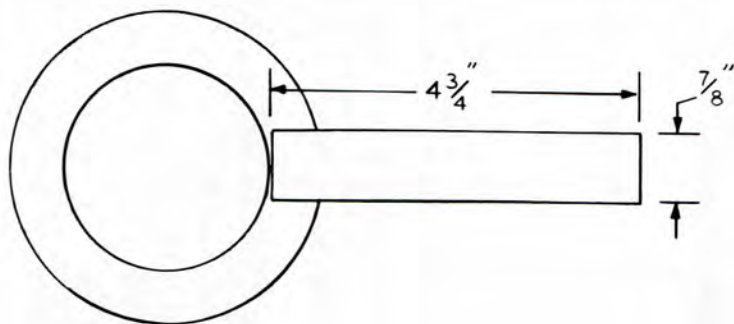
Step 8. Raise and lower carriage to full positions checking all phases of operation.



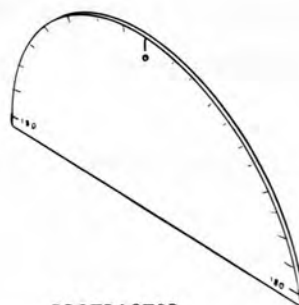
INSIDE SPANNING TOOL



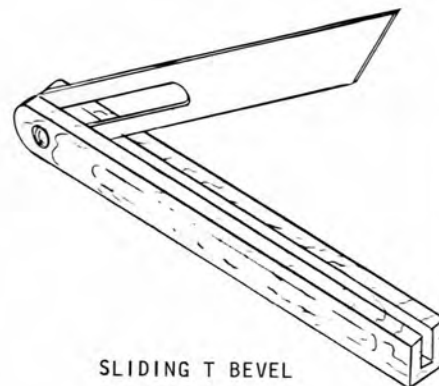
OUTSIDE SPANNING TOOL



CARPENTERS SQUARE



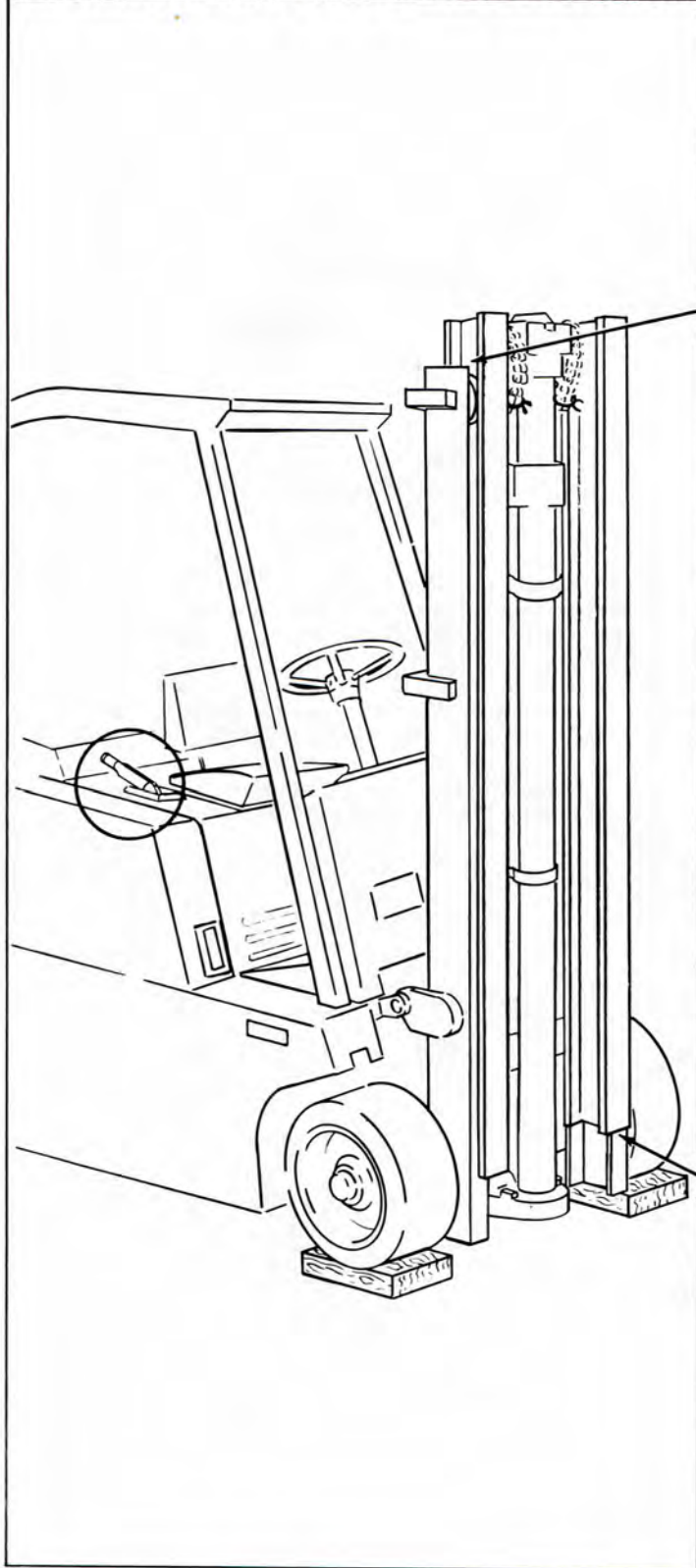
PROTRACTOR



SLIDING T BEVEL



UPRIGHT ROLLER ADJUSTMENT -- STANDARD AND HILO SERIES 500

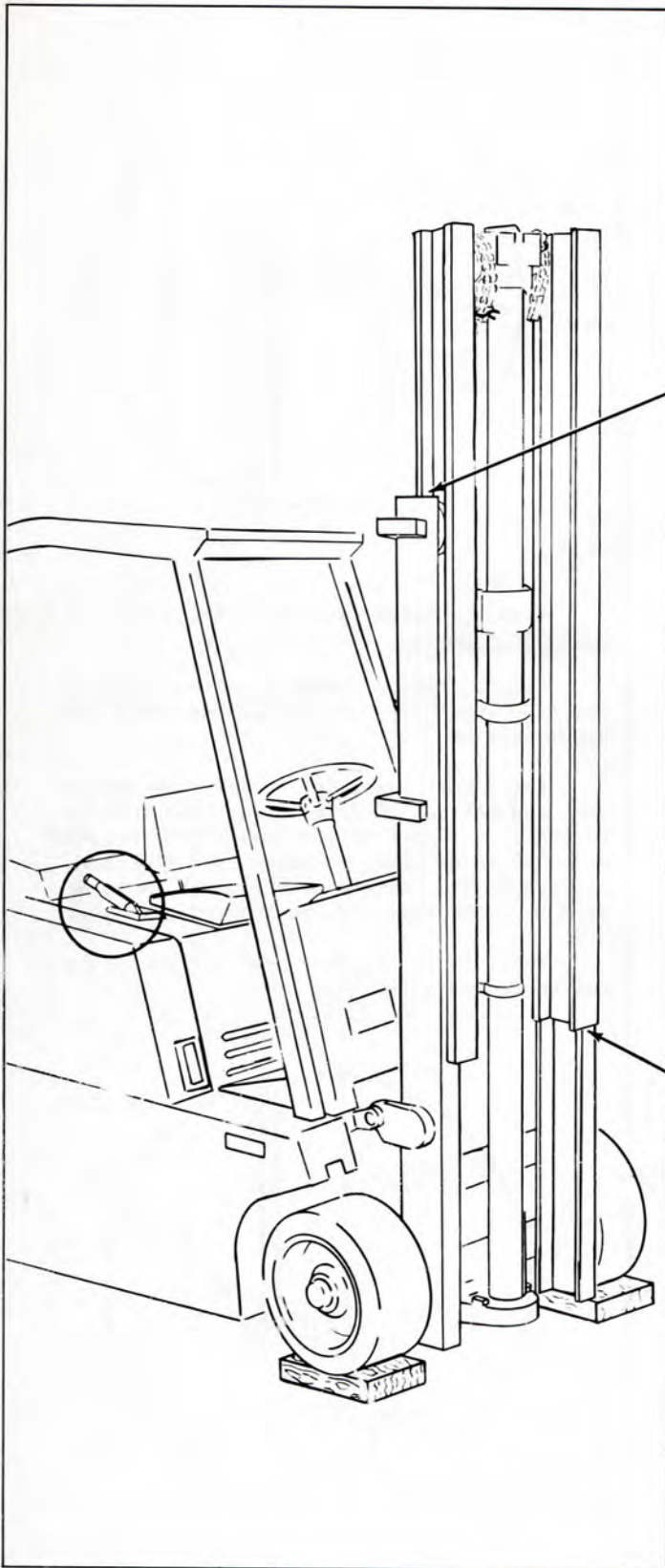


Step 1. Remove carriage. Refer to CARRIAGE REMOVAL.

Step 2. Before checking roller clearance, position inner rail about 5 inches above full down position.

Check both sides for roller clearance at (top and bottom) of inner rail. Use tool to record this number on the rail. Record number of shims to be used, on outer rail (for top rollers only). Record number of shims to be used on inner rail (for bottom rollers only).

There is to be some clearance but it is not to exceed 1/32".

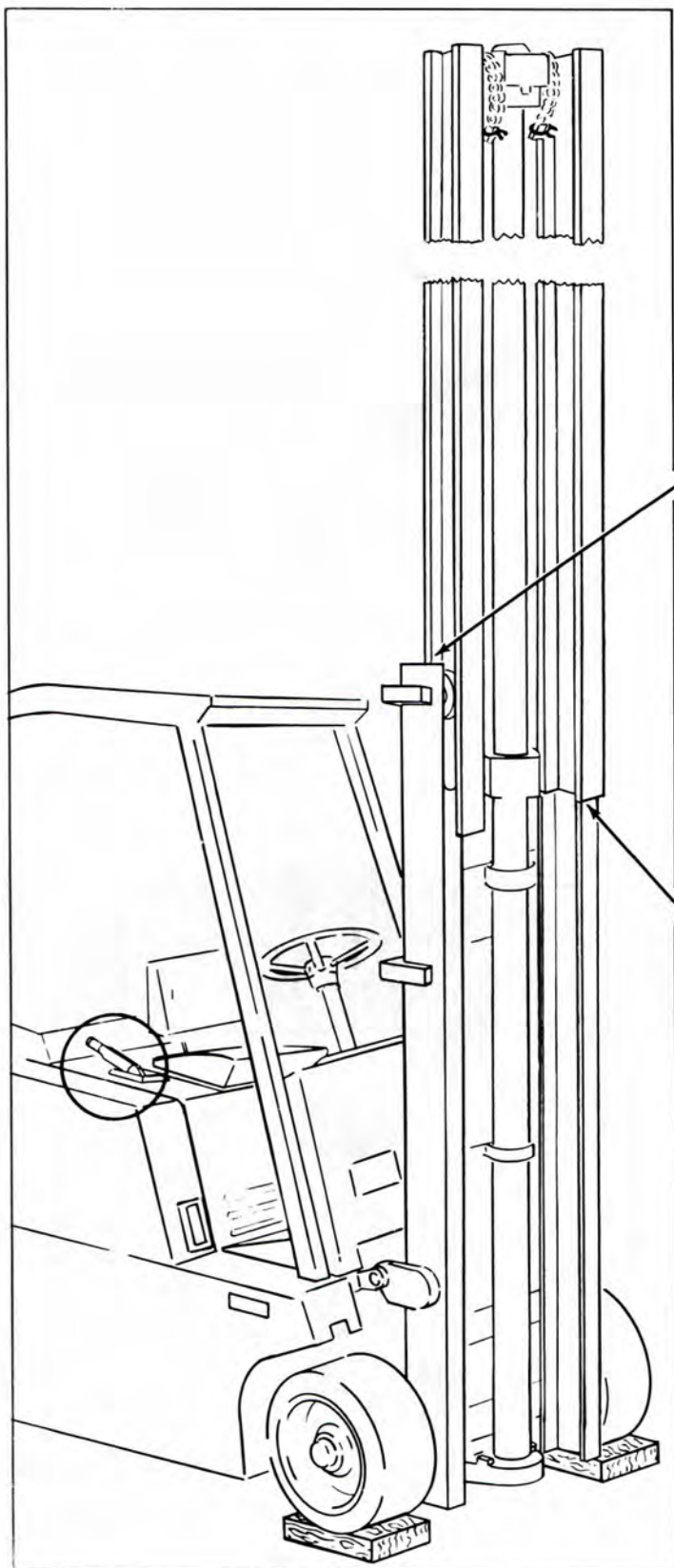


Step 3. Raise inner rail to 1/2 of its full up position. With tool and bar, check the roller clearance in the same manner as before.

Record number of shims to be used, on outer rail (for top rollers only).

Record number of shims to be used, on inner rail (for bottom rollers only).





Step 4. Raise inner rail to full up position and with tool and bar, check for roller clearance in the manner as before.

Record number of shims to be used, on outer rail (for top rollers only).

Record number of shims to be used, on inner rail (for bottom rollers only).

Plate 9806

Step 5. Raise inner rail about 5 inches and remove stop block.

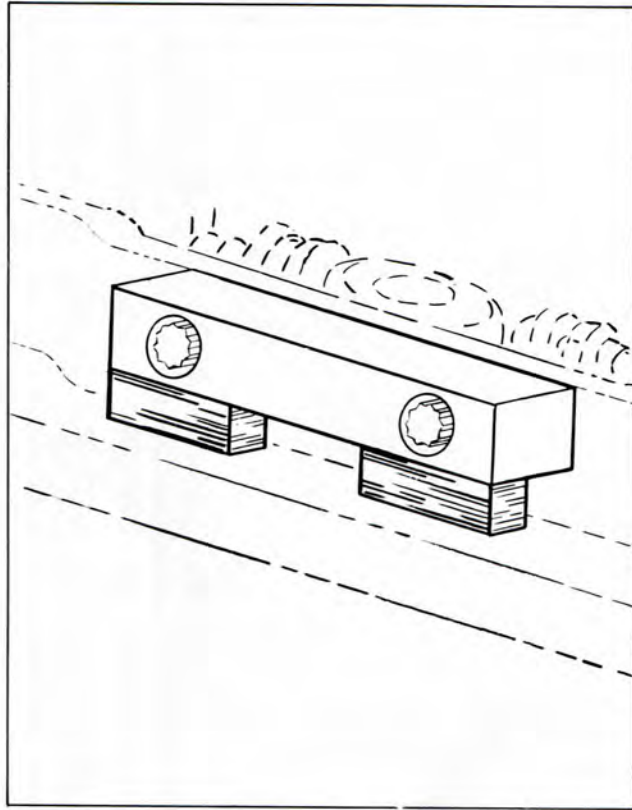


Plate 9808

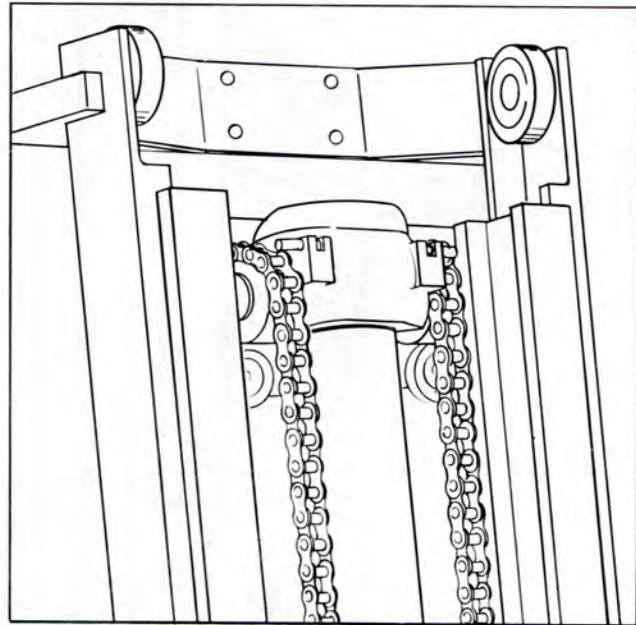
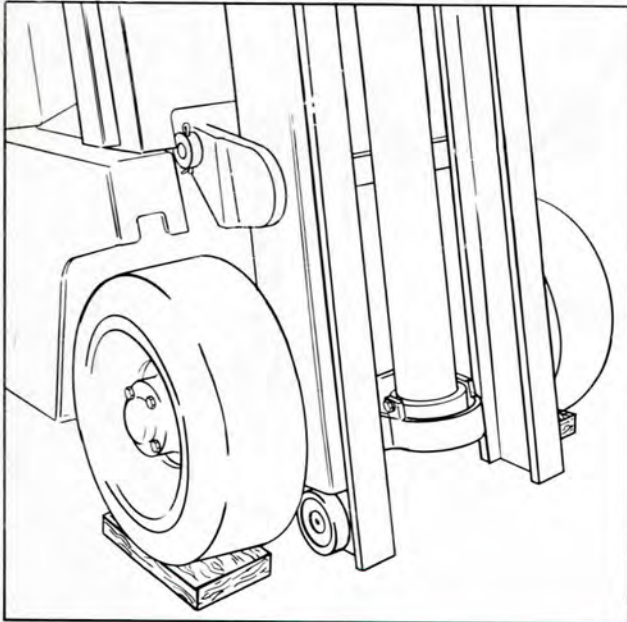


Plate 9809

Step 6. Lower inner rail until upper and lower rollers are clear for removal.

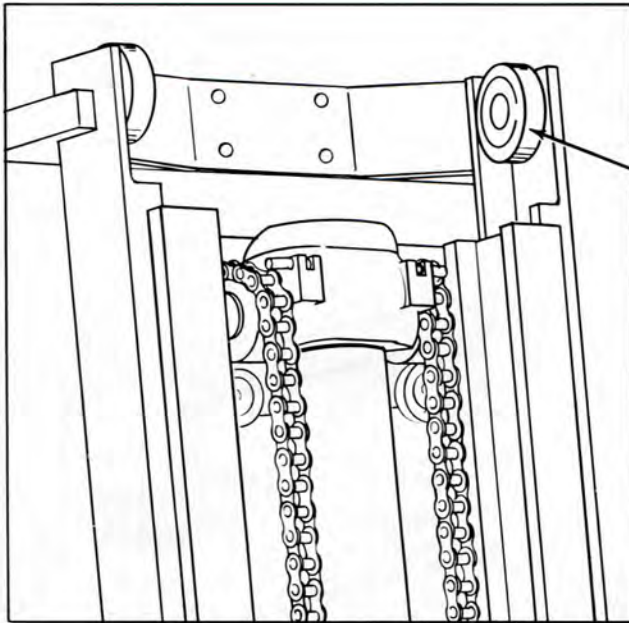


Plate 9810

Step 7. Adjusting upright rollers:

A. Outer rail rollers.

1. Count the number of shims at the right and left hand rollers.
2. Look at the three (3) numbers you recorded on the outer rail in Steps 2-3 & 4. The smallest of these numbers is the total number of shims to be added. A "0" means DO NOT add shims.
3. Your target for adjustment is to have the same number of shims at each upper roller. If you end up with an extra shim DO NOT remove it. Mark the side having an extra shim.

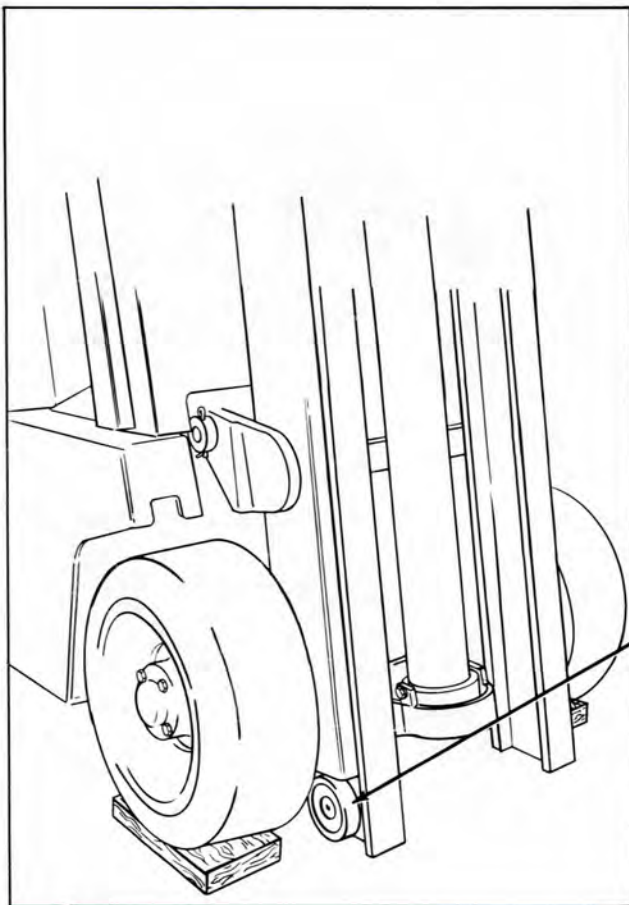


Plate 9812

B. Inner rail rollers.

1. Count the number of shims at the right and left hand rollers.
2. Look at the three (3) numbers you recorded on the inner rail in Step 2-3- & 4. Go through the same steps you followed in adjusting the upper rollers.
3. If you end up with an extra shim here too, be sure it is on the same side as the extra upper shim.

Step 8. Raise inner rail about 5 inches above upper tie bar (of the outer rail) and install stop block and pad assembly.

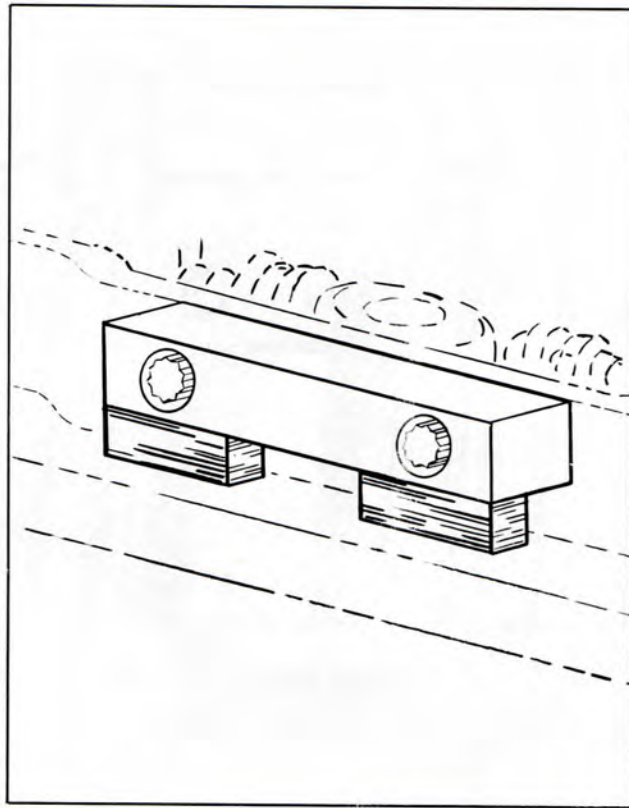


Plate 9808

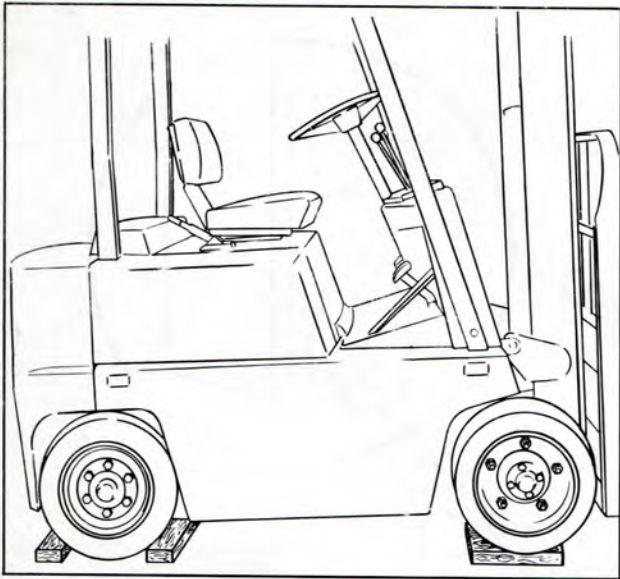


Plate 9811

Step 9. Remove carriage support chain and wheel blocks.



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### ENGINE

TROUBLE	PROBABLE CAUSE	REMEDY
Starting motor will not crank engine.	<p>Battery discharged</p> <p>Battery cable terminals loose or corroded. Ignition Fuse blown.</p> <p>Starting motor drive gear jammed in flywheel teeth.</p> <p>Improper oil.</p> <p>Battery cable terminal broken.</p> <p>Poor starting switch contacts.</p> <p>Faulty Neutral Starting Switch.</p>	<p>Recharge or replace battery.</p> <p>Remove and clean, reinstall and tighten cables. Replace fuse.</p> <p>Loosen starting motor and free-up gear.</p> <p>Change oil to proper grade.</p> <p>Replace cable.</p> <p>Replace switch.</p> <p>Refer to Starting Motor.</p>
Starting motor operates, but fails to crank engine when switch is engaged.	<p>Starting motor gear does not engage flywheel.</p> <p>Starting motor or drive gear defective.</p>	<p>Remove starting motor, and clean drive mechanism.</p> <p>Replace starting motor.</p>
<u>Engine will not start.</u> No spark. Ammeter shows no discharge (Zero reading) with ignition switch "on".	<p>Ignition switch partly "on".</p> <p>Ignition switch defective.</p> <p>Ignition primary wires or starting motor cables broken or connections loose.</p> <p>Ignition coil primary winding open.</p> <p>Distributor points dirty.</p> <p>Distributor points not closing.</p> <p>Loose or corroded ground, or battery cable connections.</p>	<p>Turn switch "on" fully.</p> <p>Replace switch.</p> <p>Repair, or replace and tighten.</p> <p>Replace coil.</p> <p>Clean and adjust points.</p> <p>Adjust or replace points.</p> <p>Remove and clean, reinstall and tighten cables.</p>
<u>Engine will not start.</u> Ammeter showing abnormal discharge with ignition switch "on".	<p>Defective condenser.</p> <p>Short-circuited or burned distributor cap or rotor.</p> <p>Short-circuited wire between ammeter and ignition switch.</p> <p>Short-circuited primary winding in ignition coil.</p> <p>Distributor points not opening.</p>	<p>Replace condenser.</p> <p>Replace parts.</p> <p>Repair or replace wire.</p> <p>Replace coil.</p> <p>Clean or replace, and adjust points.</p>
Weak spark.	<p>Distributor points pitted or burned.</p> <p>Distributor condenser weak.</p> <p>Ignition coil weak.</p>	<p>Clean or replace, and adjust points.</p> <p>Replace condenser.</p> <p>Replace coil.</p>



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### ENGINE (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
<p><u>Engine will not start.</u> Weak spark (continued)</p>	<p>Primary wire connections loose.</p> <p>High-tension, spark plug wires, or distributor cap wet.</p> <p>High-tension, spark plug wires, or distributor cap damaged.</p> <p>Distributor cap or rotor burned or broken.</p> <p>Spark plug gap incorrect.</p> <p>Short-circuited secondary circuit in coil.</p>	<p>Tighten.</p> <p>Dry thoroughly.</p> <p>Replace defective parts.</p> <p>Replace defective parts.</p> <p>Reset gaps.</p> <p>Replace coil.</p>
<p>Good spark.</p>	<p>Fuel tank empty.</p> <p>Dirt or water in carburetor, or float stuck.</p> <p>Carburetor and engine flooded by excessive use of choke.</p> <p>Fuel does not reach carburetor.</p> <p>Dirt in fuel lines or tank.</p> <p>Fuel line pinched.</p> <p>Ignition wires incorrectly installed in distributor cap.</p> <p>Ignition timing incorrect.</p> <p>Fuel Strainer Clogged.</p> <p>Fuel pump does not pump.</p> <p>Lack of engine compression.</p>	<p>Refill tank.</p> <p>Drain and clean carburetor.</p> <p>Depress accelerator pedal fully, crank engine with starting motor, when engine starts, reset throttle and leave choke control "in".</p> <p>Inspect for damaged or leaky lines or air leak into line between tank and fuel pump.</p> <p>Disconnect lines, drain tank, and blow out lines.</p> <p>Repair or replace line.</p> <p>Install wires correctly.</p> <p>Reset timing.</p> <p>Remove and clean strainer.</p> <p>Clean screen, replace pump if defective.</p> <p>Report to designated individual in authority.</p>
<p>Backfiring.</p>	<p>Ignition out of time.</p> <p>Spark plug wires incorrectly installed distributor cap or at spark plugs.</p> <p>Distributor cap cracked or shorted.</p> <p>Valve holding open.</p>	<p>Reset timing.</p> <p>Install wires correctly.</p> <p>Replace cap.</p> <p>Report to designated individual in authority.</p>

TROUBLE SHOOTING GUIDE

ENGINE (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
Engine operates, but backfires and spits.	Improper ignition timing.	Reset timing.
	Spark plug wires incorrectly installed in distributor cap.	Install wires correctly.
	Dirt or water in carburetor.	Drain and clean carburetor.
	Carburetor improperly adjusted.	Clean and adjust carburetor.
	Carburetor float level low.	Report to designated individual in authority.
	Valve sticking or not seating properly, burned or pitted.	Report to designated individual in authority.
	Excessive carbon in cylinders.	Remove carbon from cylinders.
	Valve springs weak.	Report to designated individual in authority.
	Heat control valve not operating.	Free-up, and adjust valve.
	Fuel pump pressure low.	Clean screen; replace pump, if defective.
	Fuel strainer clogged.	Remove and clean strainer.
	Partly clogged or pinched fuel lines.	Clean and repair lines.
	Intake manifold leak.	Inspect gaskets and tighten manifold stud nuts.
Distributor cap cracked or shorted.	Replace cap.	
Engine stalls on idle.	Carburetor throttle valve closes too far, or idle mixture incorrect.	Adjust carburetor.
	Carburetor choke valve remains closed.	Free-up and lubricate valve.
	Dirt or water in idler passages of Carburetor.	Clean or replace carburetor.
	Air leak at intake manifold.	Inspect gaskets and tighten manifold stud nuts.
	Heat control valve defective.	Free-up and adjust valve.
	Spark plugs defective, gaps incorrect.	Clean or replace spark plugs, set gap clearance.
	Ignition timing early.	Reset timing.
	Low compression.	Report to designated individual in authority.
	Water leak in cylinder head or head gaskets.	Replace gasket; report cylinder head leak to designated individual in authority.



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

ENGINE (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
Engine misfires on one or more cylinders.	<p>Dirty spark plugs.</p> <p>Spark plug gap incorrect.</p> <p>Cracked spark plug porcelain.</p> <p>Spark plug wires grounded.</p> <p>Spark plug wires incorrectly installed in cap or at spark plugs.</p> <p>Distributor cap or rotor burned or broken.</p> <p>Valve tappet holding valve open.</p> <p>Low engine compression.</p> <p>Leaky cylinder head gasket.</p> <p>Cracked cylinder block, broken valve tappet or tappet screw.</p>	<p>Clean, adjust, or replace plugs.</p> <p>Reset gap.</p> <p>Replace spark plug.</p> <p>Replace wires.</p> <p>Install wires correctly.</p> <p>Replace defective parts.</p> <p>Report to designated individual in authority.</p> <p>Report to designated individual in authority.</p> <p>Replace gasket.</p> <p>Report to designated individual in authority.</p>
Engine does not idle properly.	<p>Ignition timing.</p> <p>Dirty spark plugs, or gaps too close.</p>	<p>Reset timing.</p> <p>Clean and adjust spark plugs.</p>
Engine misses at high speeds.	<p>Ignition coil or condenser weak.</p> <p>Distributor points sticking, dirty or improperly adjusted.</p> <p>Distributor rotor or cap cracked or burned.</p> <p>Leaky cylinder head gaskets.</p> <p>Uneven cylinder compression.</p> <p>High-tension or spark plug wires leaky, cracked insulation.</p> <p>Carburetor choke not adjusted.</p> <p>Carburetor accelerating pump system defective, dirt in metering jets or float level incorrect.</p> <p>Fuel pump defective, causing lack of fuel.</p> <p>Air cleaner dirty.</p> <p>Heat control valve defective.</p>	<p>Replace defective parts.</p> <p>Clean, adjust, or replace points.</p> <p>Replace defective parts.</p> <p>Replace gaskets.</p> <p>Report to designated individual in authority.</p> <p>Replace defective parts.</p> <p>Adjust choke.</p> <p>Report to designated individual in authority.</p> <p>Clean screen, replace defective pump.</p> <p>Clean complete air cleaner and refill oil cup.</p> <p>Free-up and adjust</p>



## TROUBLE SHOOTING GUIDE

### ENGINE (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
Engine misses at high speeds. (continued)	<p>Valves sticking, weak or broken valve springs.</p> <p>Fuel strainer clogged.</p> <p>Weak distributor bracket arm spring</p> <p>Excessive play in distributor shaft bearing.</p> <p>Spark plugs defective, dirty or gap incorrectly set.</p>	<p>Report to designated individual in authority.</p> <p>Remove and clean strainer.</p> <p>Replace point set.</p> <p>Replace distributor.</p> <p>Clean, adjust or replace spark plugs.</p>
Engine pings (Spark Knock).	<p>Ignition timing early.</p> <p>Distributor automatic spark advance stuck in advance position, or spring broken.</p> <p>Excessive carbon deposit in cylinders.</p> <p>Incorrect fuel.</p>	<p>Reset timing.</p> <p>Replace distributor.</p> <p>Remove cylinder head and clean.</p> <p>Drain, use correct fuel.</p>
Engine lacks power.	<p>Ignition timing late.</p> <p>Incorrect fuel.</p> <p>Leaky cylinder head gasket.</p> <p>Excessive carbon formation.</p> <p>Engine runs cold.</p> <p>Insufficient oil, or improper grade oil.</p> <p>Oil system failure.</p> <p>Air Cleaner dirty.</p> <p>Spark plug gaps too wide.</p> <p>Choke valve partially closed, or throttle does not open fully.</p> <p>Manifold heat control inoperative.</p> <p>Exhaust pipe, muffler or tail pipe obstructed.</p> <p>Low compression, broken valve springs, sticking valves.</p>	<p>Reset timing.</p> <p>Use correct fuel.</p> <p>Replace gasket.</p> <p>Remove cylinder head, and clean cylinder head, piston heads, cylinder block, and valves.</p> <p>Test thermostat; in cold weather, cover radiator.</p> <p>Lubricate in accordance with lubrication section.</p> <p>Report to designated individual in authority.</p> <p>Clean complete air cleaner, change oil in cup.</p> <p>Reset gaps.</p> <p>Adjust valve or throttle.</p> <p>Free-up and adjust control.</p> <p>Service or replace obstructed parts.</p> <p>Report to designated individual in authority.</p>



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

ENGINE (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
Engine lacks power. (Continued)	Improper tappet adjustment.  Lack of fuel.	Adjust tappets.  Clean filter, inspect fuel pump, inspect carburetor for water or dirt and clean if necessary.
Engine overheats.	Cooling system deficient. Water low, air flow through radiator core restricted.  Clogged radiator core (Clogged internally).  Cylinder head gasket leaking.  Radiator or water pump leaking.  Damaged or deteriorated hose or fan belt.  Loose fan belt.  Cylinder block or head leaking.  Ignition timing incorrect.  Damaged muffler, bent or clogged exhaust pipe.  Excessive carbon in cylinders.  Insufficient oil, or improper grade.  Air Cleaner restricted.  Inoperative thermostat.  Water pump impeller broken.  Poor compression.  Valve timing incorrect.	Clean radiator core from engine side with compressed air or water, or fill radiator to proper level.  Clean by flushing radiator.  Tighten cylinder head stud nuts and/or replace gasket. Repair or replace defective parts.  Replace defective parts.  Adjust fan belt tension.  Report to designated individual in authority.  Reset timing.  Service or replace defective parts.  Remove cylinder head, and clean cylinder head, piston heads cylinder block, and valves.  Refer to Lubrication Instructions.  Clean complete change oil in cup. Replace thermostat and gasket.  Replace pump.  Report to designated individual in authority.  Reset timing.
High fuel consumption.	High engine speeds (Excessive driving in lower gear range).  Air cleaner clogged.  Carburetor float level too high, accelerating pump not properly adjusted.  Fuel line leaks.	Correct driving practice.  Clean complete air cleaner and change oil in cup. Report to designated individual in authority.  Correct leaks, replace lines.

TROUBLE SHOOTING GUIDE

ENGINE (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
<p>High fuel consumption. (Continued)</p>	<p>Overheated engine.</p> <p>Carburetor parts worn or broken.</p> <p>Fuel pump pressure too high, or leaky diaphragm.</p> <p>Engine running cold.</p> <p>Ignition incorrectly timed.</p> <p>Spark advance stuck.</p> <p>Leaking fuel pump bowl gasket.</p> <p>Low compression.</p> <p>Carburetor controls sticking.</p> <p>Engine idles too fast.</p> <p>Spark plugs dirty.</p> <p>Weak coil or condenser</p> <p>Clogged muffler, or bent exhaust pipe.</p> <p>Loose engine mounts, permitting engine to shake and raise fuel level in carburetor.</p>	<p>See "Engine overheats".</p> <p>Replace fuel carburetor.</p> <p>Replace fuel pump.</p> <p>Inspect thermostat, cover radiator in winter.</p> <p>Reset timing.</p> <p>Replace distributor.</p> <p>Replace gasket.</p> <p>Report to designated individual in authority.</p> <p>Free-up and lubricate controls.</p> <p>Adjust carburetor throttle stop screw.</p> <p>Clean or replace spark plugs.</p> <p>Replace coil or condenser.</p> <p>Service or replace defective parts.</p> <p>Tighten; if damaged, replace defective mounts.</p>
<p>High oil consumption.</p>	<p>High engine speeds, or excessive driving in low gear range.</p> <p>Oil leaks.</p> <p>Improper grade oil, or diluted oil.</p> <p>Overheating of engine causing thinning of oil.</p> <p>Oil filter clogged.</p> <p>Defective piston or rings, excessive side clearance of intake valves in guides, cylinder bores worn (scored, out-of-round, tapered); excessive bearing clearance, misaligned connecting rods.</p>	<p>Correct driving practice.</p> <p>Replace leaking gaskets.</p> <p>Use new oil of proper grade.</p> <p>See "Engine overheats".</p> <p>Clean filter case thoroughly and replace element.</p> <p>Report to designated individual in authority.</p>



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

ENGINE (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
Low oil pressure.	Insufficient oil supply. Improper grade of oil, or diluted oil foaming at high speeds. Oil too heavy (funneling in cold weather). Oil pump screen clogged. Oil leaks. Faulty oil pump, pressure regulator valve stuck or improperly adjusted, or spring broken.	Fill crankcase to prescribed level. Change oil, inspect crankcase ventilator, inspect for water in oil. Change to proper grade oil. (Refer to Lubrication Instructions). Remove oil pan and clean pump screen. Report to designated individual in authority. Report to designated individual in authority.
Defective valves.	Incorrect tappet adjustment. Other valve troubles.	Adjust tappets. Report to designated individual in authority.
Abnormal engine noises.	Loose fan, fan pulley or belt, heat control valve. Leaking intake or exhaust manifold or gaskets, cylinder head gasket, or spark plugs. Overheated engine, clogged exhaust system. Other abnormal engine noises.	Tighten or correct conditions as required. Tighten loose components or replace defective gaskets. Remove obstruction from exhaust system. Inspect for further serviceability. Report to designated individual in authority.
Poor compression.	Incorrect tappet adjustment. Leaking, sticking, or burned valves; sticking tappets; valve spring weak or broken; valve stems and guides worn; piston ring grooves worn or rings worn, broken, or stuck; cylinder bores scored or worn.	Adjust tappets. Report to designated individual in authority.



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### FUEL SYSTEM

TROUBLE	PROBABLE CAUSE	REMEDY
Fuel does not reach carburetor.	No fuel in fuel tank. Fuel pump inoperative. Fuel line air leak between tank and fuel pump. Fuel line clogged. Fuel tank cap vent clogged.	Fill fuel tank. Replace pump. Repair or replace line. Disconnect and blow out lines. Clean vent.
Fuel reaches carburetor, but does not reach cylinders.	Choke does not close. Fuel passage in carburetor clogged. Carburetor float valve stuck closed.	Free-up and lubricate, inspect for proper operation. Clean or replace carburetor. Report to designated individual in authority.
High fuel consumption.	Lubricant in power train too heavy. Incorrect adjustment of carburetor. Vehicle overloaded. Tires improperly inflated. Tight brakes.	Use correct lubricant. Adjust carburetor. Reduce loads to specified maximum capacity. Inflate tires properly. Adjust brakes.
Low fuel pressure.	Air leak in fuel lines. Fuel pump defective, diaphragm broken; valves leaking, linkage worn. Fuel lines clogged.	Tighten connections, repair lines if damaged. Replace fuel pump. Clean or replace lines.
Engine idles too fast.	Improper carburetor throttle stop adjustment. Carburetor control sticking. Control return spring weak.	Adjust throttle stop screw. Free-up and lubricate control. Replace spring.
Fuel gauge does not register.	Loose wire connection at instrument panel or tank unit. Instrument panel unit or tank unit inoperative.	Tighten connections. Replace unit.



# INDUSTRIAL TRUCK DIVISION

1964 MODEL GUIDE



1964 MODEL

Model	Capacity (Lbs.)	Speed (Mph.)
Model 1000	1000	10
Model 1500	1500	12
Model 2000	2000	14
Model 3000	3000	16
Model 4000	4000	18
Model 5000	5000	20



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### COOLING SYSTEM

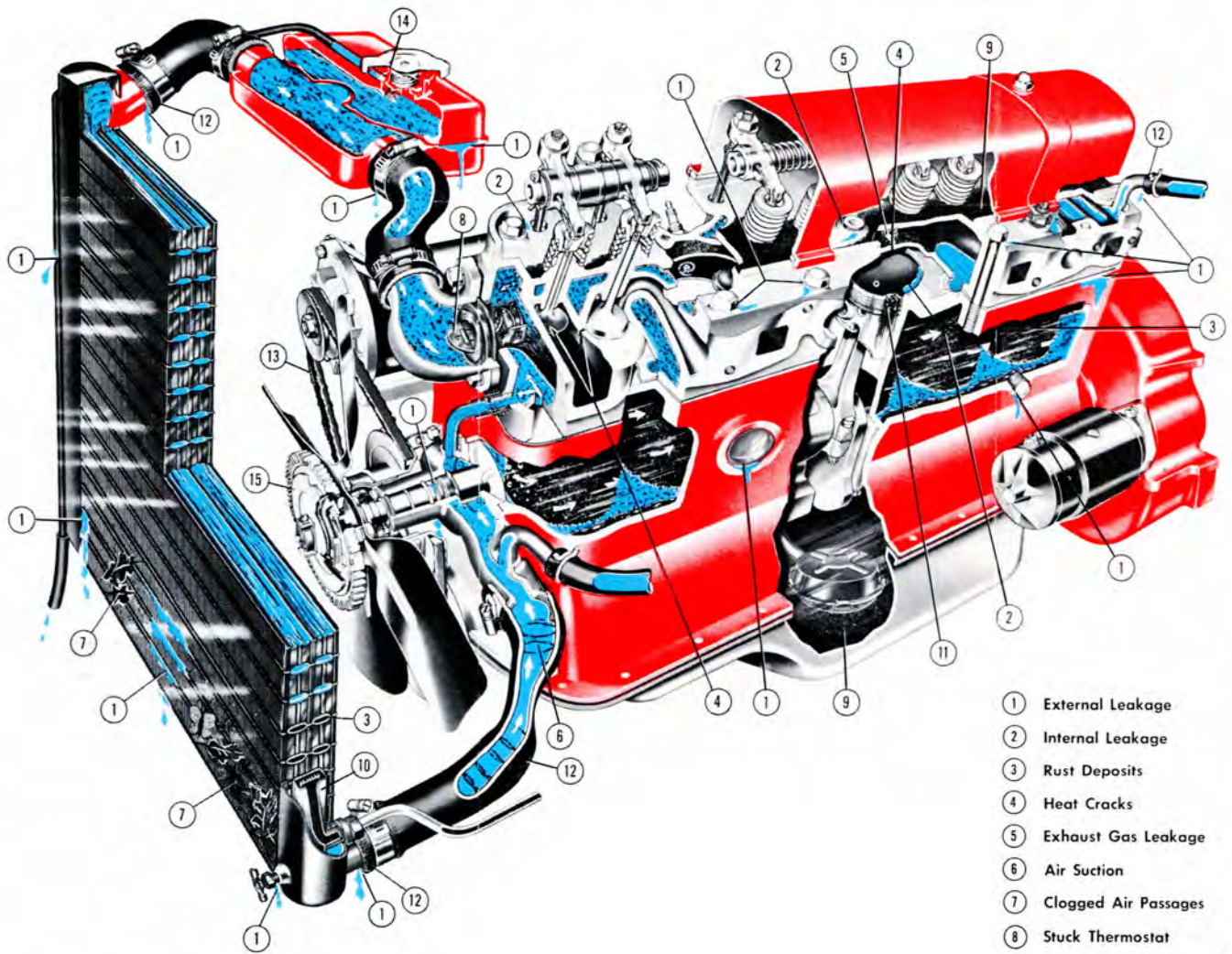
TROUBLE	PROBABLE CAUSE	REMEDY
Overheating.	Unusual operating conditions of high temperature.	Inspect. (Refer to "Engine overheats".)
Loss of cooling solution.	Loose hose connections. Damaged or deteriorated hose. Leaking radiator.	Tighten hose connections. Replace hoses. Repair or replace radiator.
Engine operates too cool.	Thermostat sticking. Low air temperature.	Replace thermostat and gasket. Cover radiator.
Noises.	Frayed or loose fan belt. Water pump defective.	Replace or adjust belt. Replace pump.





# THE ENGINE COOLING SYSTEM

Trouble spots resulting from service neglect



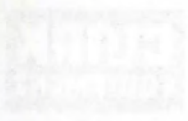
- ① External Leakage
- ② Internal Leakage
- ③ Rust Deposits
- ④ Heat Cracks
- ⑤ Exhaust Gas Leakage
- ⑥ Air Suction
- ⑦ Clogged Air Passages
- ⑧ Stuck Thermostat
- ⑨ Sludge Formation in Oil
- ⑩ Transmission Oil Cooler
- ⑪ Heat Damage
- ⑫ Hose Failure
- ⑬ Worn Fan Belt
- ⑭ Pressure Cap Leakage
- ⑮ Temperature Control Fan Drive

The cooling system depicted here does not represent that of any particular make of car; it incorporates features used by many different manufacturers.

All Rights Reserved.  
No Part of This Chart May Be Reproduced Without Permission From Union Carbide Corporation.

## Cooling System Care Pays!

This chart is distributed as a public service by  
**UNION CARBIDE CONSUMER PRODUCTS COMPANY**  
Division of Union Carbide Corporation



# THE ENGINE COOLING SYSTEM

(Leads to spots resulting from service neglect)



Faint text on the left side, likely a list of parts or a legend for the diagram.

COOLING SYSTEM OVERVIEW

Small text at the bottom center, possibly a reference or copyright notice.



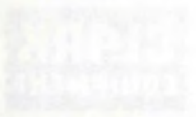
# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### IGNITION SYSTEM

TROUBLE	PROBABLE CAUSE	REMEDY
Ignition system troubles.	<p>Weak spark.</p> <p>Timing incorrect.</p> <p>Moisture on distributor wires, coil, or spark plugs.</p> <p>Ignition switch inoperative.</p> <p>Primary or secondary wiring loose, broken, or grounded.</p> <p>Coil defective.</p> <p>Distributor defective.</p> <p>Spark plug defective.</p>	<p>Refer to "Engine will not start".</p> <p>Retime ignition.</p> <p>Clean and dry thoroughly.</p> <p>Replace switch.</p> <p>Service.</p> <p>Refer to "Ignition coil troubles", below.</p> <p>Refer to "Distributor troubles", below.</p> <p>Refer to spark plug troubles below.</p>
Ignition coil.	<p>Connections loose; dirty or broken external wire, wet.</p> <p>Coil defective.</p>	<p>Clean and tighten, or repair, dry thoroughly.</p> <p>Replace coil.</p>
Distributor troubles.	<p>Distributor breaker points dirty or pitted, point gaps incorrect.</p> <p>Distributor breaker point arm spring weak.</p> <p>Distributor breaker points sticking.</p> <p>Distributor automatic advance defective.</p> <p>Distributor cap or rotor shorted, cracked or broken.</p> <p>Distributor rotor does not turn.</p> <p>Condenser defective.</p>	<p>Clean, adjust or replace breaker points.</p> <p>Replace breaker point arm.</p> <p>Free-up breaker points.</p> <p>Lubricate and free-up. If seized, replace distributor.</p> <p>Replace defective parts.</p> <p>Report to designated individual in authority.</p> <p>Replace condenser.</p>
Spark plug troubles.	<p>Cracked, broken, leaking, or improper type.</p> <p>Spark plug wires incorrectly installed on plugs or in distributor cap.</p> <p>Spark plugs dirty; gap incorrect.</p> <p>Spark plug porcelain cracked or broken.</p>	<p>Replace spark plug.</p> <p>Install wires correctly.</p> <p>Clean, set gaps, or replace plugs.</p> <p>Replace plug.</p>



# INDUSTRIAL (MVC) DIVISION



Form No. 1

PROPERTY	CLASSIFICATION	VALUATION
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]
[Faint text]	[Faint text]	[Faint text]





# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### STARTING MOTOR

TROUBLE	PROBABLE CAUSE	REMEDY
Starting motor cranks engine slowly.	<p>Engine oil too heavy.</p> <p>Battery charge low.</p> <p>Battery cell shorted.</p> <p>Battery connections corroded, broken, or loose.</p> <p>Dirty commutator.</p> <p>Insufficient brush surface contact.</p> <p>Defective starting motor.</p> <p>Starting switch defective.</p>	<p>Change to proper grade oil.</p> <p>Recharge or replace battery.</p> <p>Replace battery.</p> <p>Clean and tighten, or replace cables.</p> <p>Clean commutator.</p> <p>Free-up or replace brush.</p> <p>Replace starting motor.</p> <p>Replace switch.</p>
Starting motor does not crank engine.	<p>Engine oil too heavy.</p> <p>Starting motor, Solenoid, or cables defective; loose connections.</p> <p>Starting motor pinion gear jammed in flywheel drive gear.</p> <p>Dirty drive mechanism.</p> <p>Faulty Relay Switch.</p> <p>Ignition Fuse Blown.</p> <p>Faulty Ignition Switch.</p> <p>Faulty Neutral Starting Switch.</p>	<p>Change to proper grade oil.</p> <p>Replace or tighten loose connections.</p> <p>Remove starting motor and reinstall. Replace defective driving gear.</p> <p>Clean and lubricate drive mechanism.</p> <p>Replace Relay Switch.</p> <p>Replace Fuse.</p> <p>Replace Switch.</p> <p>Replace Switch.</p> <p>NOTE: The INDEX of this manual will list an ADJUSTABLE Neutral Starting Switch if your machine is so equipped.</p>



# INDUSTRIAL TRUCK DIVISION



TRUCK SHOOTING GUIDE

## STARTING MOTOR

SYMPTOM	POSSIBLE CAUSE	TROUBLE
<p>Change to proper size of battery - replace battery</p> <p>Check and tighten or replace loose connections</p> <p>Check terminals</p> <p>Free-up or replace brush</p> <p>Replace motor</p> <p>Replace switch</p>	<p>Engine oil too heavy</p> <p>Battery charge low</p> <p>Battery cell corroded</p> <p>Battery connections corroded, loose, or loose</p> <p>Dirty commutator</p> <p>Insufficient brush spring contact</p> <p>Belts too tight or too loose</p> <p>Starting switch defective</p>	<p>Starting motor runs engine slowly</p>
<p>Change to proper size of battery - replace loose connections</p> <p>Remove starting motor and replace</p> <p>Replace defective starting switch</p> <p>Check and lubricate drive rollers</p> <p>Replace battery switch</p> <p>Replace fuse</p> <p>Replace switch</p> <p>Replace brush</p> <p>NOTE: The index of this book will list an INDUSTRIAL TRUCK SHOOTING GUIDE which is available.</p>	<p>Engine oil too heavy</p> <p>Starting motor, defective or loose electrical lead connection</p> <p>Starting motor drive gear jammed in flywheel drive gear</p> <p>Dirty drive mechanism</p> <p>Faulty battery switch</p> <p>15-amp fuse blown</p> <p>15-amp fuse defective</p> <p>15-amp fuse defective</p>	<p>Starting motor does not crank engine</p>

TROUBLE SHOOTING GUIDE

GENERATOR TROUBLES

TROUBLE	PROBABLE CAUSE	REMEDY
No output.	Regulator defective.	Replace regulator.
Low or fluctuating output.	Loose fan belt. Insufficient brush surface contact. Weak brush springs. Worn commutator. Broken or loose connections. Dirty commutator. Regulator defective. Loose or dirty connections in charging circuit.	Adjust belt. Free-up or replace brush. Replace spring. Report to designated individual in authority. Repair, tighten or replace. Clean commutator. Replace regulator. Clean and tighten connections.
Excessive output.	Short circuit between field coil and armature leads. Regulator defective.	Replace generator. Replace regulator.
Noisy.	Loose pulley or generator mounting. Defective bearings, or armature rubbing on field poles. Improperly seated brushes.	Tighten. Replace generator. Seat brushes.
Generator regulator troubles.	Loose connections or mountings. Defective regulator.	Clean and tighten. Replace regulator.



# INDUSTRIAL TRUCK DIVISION

INDUSTRIAL TRUCK DIVISION

INDUSTRIAL TRUCK DIVISION

Product	Model / Description	Capacity
Forklift	Counterbalance	3,000 lbs
Forklift	Tow Motor	5,000 lbs
Forklift	Reach Truck	4,000 lbs
Forklift	Turret Truck	5,000 lbs
Forklift	Order Picker	3,000 lbs
Forklift	Turret Truck	5,000 lbs
Forklift	Turret Truck	5,000 lbs
Forklift	Turret Truck	5,000 lbs
Forklift	Turret Truck	5,000 lbs
Forklift	Turret Truck	5,000 lbs
Forklift	Turret Truck	5,000 lbs
Forklift	Turret Truck	5,000 lbs
Forklift	Turret Truck	5,000 lbs



## TROUBLE SHOOTING

ALTERNATOR

## I M P O R T A N T

SINCE THE ALTERNATOR AND REGULATOR ARE DESIGNED FOR USE ON ONLY ONE POLARITY SYSTEM, THE FOLLOWING PRECAUTIONS MUST BE OBSERVED WHEN WORKING ON THE CHARGING CIRCUIT. FAILURE TO OBSERVE THESE PRECAUTIONS WILL RESULT IN SERIOUS DAMAGE TO THE ELECTRICAL EQUIPMENT.

1. When installing a battery, always make absolutely sure the ground polarity of the battery and the ground polarity of the alternator are the same.
2. When connecting a booster battery, make certain to connect the negative battery terminals together and the positive battery terminals together.
3. When connecting a charger to the battery, connect the charger positive lead to the battery positive terminal and the charger negative lead to the battery negative terminal.
4. Never operate the alternator on open circuit. Make absolutely certain all connections in the circuit are secure.
5. Do not short across or ground any of the terminals on the alternator or regulator.
6. Do not attempt to polarize the alternator.

## I N S P E C T I O N

1. The terminals should be inspected for corrosion and loose connections.
2. The wiring should be inspected for frayed insulation.
3. Check the mounting bolts for tightness.
4. Check the belt/s for correct alignment...proper tension and wear. Belt tension should be inspected and adjusted, if necessary, every 100 operating hours and adjusted per the procedures listed on page 100H 203.
5. After extended periods of operation, or at time of engine overhaul, the alternator may be removed from the vehicle for a thorough inspection and cleaning of all parts. The alternator requires no other service other than the previously mentioned inspection. When it becomes necessary to perform tests and internal inspection at the alternator, see your nearest authorized Clark Equipment Dealer.



## TROUBLE SHOOTING GUIDE

## BATTERY, LIGHTS AND HORN

TROUBLE	PROBABLE CAUSE	REMEDY
Battery discharged.	Battery solution level low.  Short in battery cell.  Generator not charging.  Loose or dirty connections; broken cables.  Excessive use of starting motor.  Idle battery, or excessive use of lights with engine at idle.  Short circuits.	Add distilled water to bring level above plates; inspect for cracked case.  Replace battery.  Inspect generator, fan belt, and regulator.  Clean and tighten connections; replace cables.  Tune up engine; charge battery.  Recharge or replace battery. Use lights sparingly.  Replace defective wiring.
Battery (other troubles)	Overheated battery.  Case bulged (or out of shape).	Inspect for short circuit or excessive generator charge.  Inspect for overcharging and over-tightening of hold-down screws.
Light switch.	Loose or dirty connections; broken wire.  Defective switch.	Clean and tighten; replace broken wire.  Replace switch.
Wiring.	Loose or dirty connections; broken wire or terminal.	Clean, tighten, repair or replace. Wire or terminal.
Lights do not light.	Switch not fully "on".  Loose or dirty connections; broken wire.  Wiring circuit short-circuited, or open.  Light burned out.	Turn switch "on" fully.  Clean and tighten; replace or repair wire or terminal.  Correct short circuit or replace defective parts.  Replace light.
Lights dim.	Loose or dirty connection.  Wiring short-circuited.  Defective switch.	Clean and tighten connections.  Correct short circuit or replace defective parts.  Replace switch.



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

BATTERY, LIGHTS AND HORN (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
Horn troubles.	Loose or dirty wiring connections.	Clean and tighten connections.
Horn sounds continuously.	Short-circuit in wiring between horn and horn button.	Replace wire.
Improper tone.	Loose or dirty wiring connections. Cover or bracket screws loose. Points adjusted improperly.	Clean and tighten connections. Tighten. Adjust points.
Horn will not operate.	Horn Fuse Blown. Open Circuit. Faulty Horn Relay.	Replace Fuse. Trace, repair or replace as required. Replace relay.



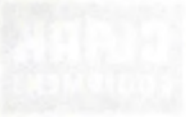
# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### DRIVE AXLE

TROUBLE	PROBABLE CAUSE	REMEDY
Continuous Axle Noise.	Badly worn parts. Unevenly worn tires. Improperly adjusted wheel bearing. Lack of lubricant.	Replace worn parts with new. Replace tires. Adjust correctly. Add sufficient lubricant of correct grade.
Axle Noise on Drive or on Coast Only.	Differential pinion gear and ring gear out of adjustment or worn excessively.	Adjust, repair or replace entire unit if conditions warrants.
Excessive Backlash in Axle Driving.	Loose axle shaft drive flange cap screws. Flange loose on axle shaft. Worn splines on axle shaft at differential end. Differential drive pinion gear and ring gear out of adjustment or worn excessively.	Tighten cap screws. Reweld flange to shaft. Replace drive flange and shaft assembly. Adjust or replace as condition warrants.
Complete Failure to Function.	Broken axle shaft. Broken teeth on ring gear or pinion gear.	Replace axle shaft. Replace ring gear and pinion and other parts of differential necessary. Adjust ring gear and pinion gear correctly.



# INDUSTRIAL DIVISION



Form No. 100 (Rev. 1-15-60)

SECTION 1	SECTION 2	SECTION 3
<p>1. Name of the company or organization</p> <p>2. Address of the company or organization</p> <p>3. City and State</p> <p>4. Date of report</p>	<p>5. Name of the person or persons making the report</p> <p>6. Title or position of the person or persons making the report</p> <p>7. Nature of the work or activity</p> <p>8. Description of the work or activity</p>	<p>9. Results of the work or activity</p> <p>10. Conclusions or recommendations</p>
<p>11. Name of the person or persons making the report</p> <p>12. Title or position of the person or persons making the report</p> <p>13. Nature of the work or activity</p> <p>14. Description of the work or activity</p>	<p>15. Results of the work or activity</p> <p>16. Conclusions or recommendations</p>	<p>17. Name of the person or persons making the report</p> <p>18. Title or position of the person or persons making the report</p> <p>19. Nature of the work or activity</p> <p>20. Description of the work or activity</p>
<p>21. Name of the person or persons making the report</p> <p>22. Title or position of the person or persons making the report</p> <p>23. Nature of the work or activity</p> <p>24. Description of the work or activity</p>	<p>25. Results of the work or activity</p> <p>26. Conclusions or recommendations</p>	<p>27. Name of the person or persons making the report</p> <p>28. Title or position of the person or persons making the report</p> <p>29. Nature of the work or activity</p> <p>30. Description of the work or activity</p>



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### STEERING AXLE

TROUBLE	PROBABLE CAUSE	REMEDY
Trouble.	Damaged axle. Lubrication leaks. Incorrect caster or camber. Uneven tire wear.	Replace axle. Replace oil seals. (Refer to Lubrication Section). Report to designated individual in authority. Report to designated individual in authority. Inflate tires properly. Check wheel alignment.







# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### STEERING

TROUBLE	PROBABLE CAUSE	REMEDY
Steering difficult.	Lack of lubrication  Tight steering system connections.  Tight steering gear; misaligned wheels.  Bent steering connecting linkage or arm.  Misaligned steering gear mounting.	Lubricate.  Lubricate and adjust linkage.  Report to designated individual in authority.  Straighten or replace linkage.  Adjust mounting.
Wander or weaving.	Improper toe in camber or caster (axle twisted).  Steering system connections or king pin bearings not properly lubricated.  Loose wheel bearings.  Steering gear worn or maladjusted.  Steering gear mountings loose.	Report to designated individual in authority.  Lubricate.  Adjust wheel bearings.  Report to designated individual in authority.  Tighten mounting bolts.
Low speed shimmy or wobble.	Loose steering connections.  Steering gear worn, or adjustment too loose.  Loose wheel bearings.	Adjust and tighten linkage.  Report to designated individual in authority.  Adjust wheel bearings.
Vehicle pulls to one side.	Odd size, or new and old tires on opposite wheels.  Tight wheel bearings.  Bent steering arm or connection.	Match tires.  Adjust. Lubricate wheel bearings.  Straighten or replace bent linkage.



# INDUSTRIAL TRUCK DIVISION



Model	Description	Capacity
Model 100	Hand truck with 2 wheels, 100 lb capacity.	100 lb
Model 200	Hand truck with 2 wheels, 200 lb capacity.	200 lb
Model 300	Hand truck with 2 wheels, 300 lb capacity.	300 lb
Model 400	Hand truck with 2 wheels, 400 lb capacity.	400 lb
Model 500	Hand truck with 2 wheels, 500 lb capacity.	500 lb



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### BRAKES

TROUBLE	PROBABLE CAUSE	REMEDY
Brakes drag.	<p>Improper pedal adjustment.</p> <p>Brake pedal return spring broken or weak.</p> <p>Brakes improperly adjusted.</p> <p>Brake shoe anchor pin tight in shoe.</p> <p>Brake shoe return spring broken or weak.</p> <p>Loose or damaged wheel bearings.</p> <p>Insufficient brake shoe clearance, or improper brake anchor pin adjustment.</p> <p>Brake backing plate loose.</p> <p>Grease on linings.</p> <p>Dirt imbedded in lining.</p> <p>Drums scored or rough.</p>	<p>Adjust brake pedal free travel.</p> <p>Replace spring.</p> <p>Adjust brakes.</p> <p>Free-up pin and lubricate lightly.</p> <p>Replace spring.</p> <p>Adjust or replace wheel bearings.</p> <p>Adjust brakes.</p> <p>Tighten plate.</p> <p>Correct grease leakage; clean or install new shoes and lining assemblies.</p> <p>Clean lining with wire brush.</p> <p>Replace drum and brake shoe and lining assemblies.</p>
Severe brake action on light pedal pressure.	<p>Brake shoes improperly adjusted.</p> <p>Grease on linings.</p> <p>Loose brake shoe anchor.</p>	<p>Adjust brakes.</p> <p>Correct grease leakage; clean or install new shoes and lining assemblies.</p> <p>Adjust and tighten.</p>
Brake locked.	<p>Brake pedal lacks free travel.</p> <p>Brakes frozen to drums (cold weather).</p>	<p>Adjust pedal free travel.</p> <p>Break loose by driving vehicle.</p>
Brake noisy or chatters.	<p>Brake lining worn.</p> <p>Grease on linings.</p> <p>Dirt embedded in linings.</p> <p>Improper or loose linings.</p> <p>Brake shoe or drum distorted.</p>	<p>Replace shoe and lining assemblies.</p> <p>Correct leakage; clean or replace shoe and lining assemblies.</p> <p>Clean lining with wire brush.</p> <p>Replace shoe and lining assemblies.</p> <p>Straighten or replace.</p>



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### BRAKES (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
Excessive pedal travel.	Lining worn. Brake improperly adjusted. Scored brake drums.	Adjust or replace shoe and lining assemblies. Adjust brake. Repair or replace drums.
Excessive pedal pressure.	Grease on linings; worn or glazed lining. Warped brake shoes, or defective brake linings. Shoes improperly adjusted. Brake drum scored or distorted. Shoes improperly adjusted. Insufficient fluid in master cylinder.	Correct grease leakage; clean up and replace shoe and lining assemblies. Replace shoe and lining assemblies. Adjust brakes. Repair or replace drums. Adjust brakes. Fill master cylinder to within 1/4 inch of the top.
Wheel troubles.	Wheel wobbles; bent. Wheel loose on hub. Wheel out of balance. Wheel bearings run hot.	Inspect mounting on hub, spindles, and drive axle; replace defective wheel or mounting. Tighten. Balance wheel. Adjust, lubricate wheel bearings.

HYDRAULIC SYSTEM

TROUBLE	PROBABLE CAUSE	REMEDY
Pump not delivering oil.	<p>Wrong direction *of rotation.</p> <p>Tank oil level low.</p> <p>Oil intake pipe or suction filter plugged.</p> <p>Air leak in suction line.</p> <p>Oil viscosity too heavy to pick up prime.</p> <p>Broken pump shaft or gear.</p>	<p>Must be reversed immediately to prevent seizure and breakage of parts due to lack of oil.</p> <p>Add recommended oil.</p> <p>Replace filter cartridge, clean strainer if so equipped.</p> <p>Will prevent priming, or cause noise and irregular action of control circuit.</p> <p>Thinner oil should be used, per recommendations for given perature and service.</p> <p>Report to designated individual in authority.</p>
Pump not developing pressure.	<p>Pump not delivering oil for any of the above reasons.</p> <p>Relief valve setting not high enough.</p> <p>Relief valve sticking open.</p> <p>Leak in hydraulic control system (cylinders or valves).</p> <p>Partially clogged intake line, intake filter or restricted intake pipe.</p>	<p>Check oil circulation by watching oil in tank.</p> <p>Refer to relief valve instructions.</p> <p>Dirt under pressure adjustment valve. Refer relief valve instructions.</p> <p>Find leak and correct.</p> <p>Pump must receive intake oil freely or cavitation will take place.</p>
Pump making noise.	<p>Small air leak at pump intake piping joints.</p> <p>Air leak at pump shaft packing.</p> <p>Tank air vent plugged.</p> <p>Too high oil viscosity.</p> <p>Shaft packing worn.</p> <p>Oil filter dirty.</p>	<p>Test by pouring oil on joints while listening for change in operation. Tighten as required.</p> <p>Repair or replace.</p> <p>Must be open thru breather opening or air filter.</p> <p>Use recommended oils.</p> <p>Replace shaft packing per preceding instructions.</p> <p>Replace filter element.</p>
Forks do not lift to maximum height.	<p>Hydraulic Oil level low.</p>	<p>Fill sump tank.</p>



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### HYDRAULIC SYSTEM CONTINUED

TROUBLE	PROBABLE CAUSE	REMEDY
Lift or tilt action fails.	Loss of oil pressure.	Report to designated individual in authority.
Oil leak at top of lift cylinder assembly.	Worn or damaged lift piston seal. Scored cylinder wall. Plugged vent line.	Replace seal. Replace cylinder. Clean out vent line. Replace if collapsed.
Oil leak around piston rod at tilt cylinder.	Worn seal. Scored piston rod.	Replace seal. Replace rod and eliminate cause of scoring which may be caused by misalignment, worn bearing or foreign matter.
With load centered on lift forks load is lifted unevenly.	Lift chains out of adjustment.	Adjust chains.



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### TRANSMISSION, CONVERTER AND AXLE ADAPTOR (HYDRATORK DRIVE)

TROUBLE	PROBABLE CASE	REMEDY
Machine will not move in either direction.	<p>Parking Brake not released.</p> <p>Control Linkage not Properly adjusted.</p> <p>Oil level low.</p> <p>No oil pressure.</p>	<p>Release brake.</p> <p>Readjust linkage.</p> <p>Determine cause and correct. Fill to proper level with Type "A" Automatic Transmission Fluid Armour Qualified.</p> <p>Report to designated person in authority.</p>
Machine will move in one direction only.	<p>Control linkage not adjusted.</p> <p>No oil pressure to Directional Selector. Seals and "O" Rings in Directional Selector may be defective.</p> <p>Directional Selector Discs not releasing. Discs defective. Relief hole in D.S. Drum clogged.</p>	<p>Adjust linkage.</p> <p>Report to designated person in authority.</p> <p>Report to designated person in authority.</p>
Machine moves slowly in both directions at wide open throttle.	<p>Oil level low.</p> <p>Low oil pressure. Faulty Inching Valve, Faulty Relief Valve, Faulty Pump.</p> <p>Brakes dragging.</p> <p>Clogged Sump Screen.</p>	<p>Fill to correct level and determine cause for loss of oil.</p> <p>Report to designated person in authority.</p> <p>Report to designated person in authority.</p> <p>Clean Screen.</p>
Transmission overheating.	<p>Low oil.</p> <p>Low Directional Selector pressure (check with gauge). Inching valve not functioning properly.</p> <p>Seals in selector defective.</p> <p>Regulating valve sticking open.</p> <p>Brakes Dragging.</p> <p>Clogged Sump Screen.</p>	<p>Check and fill to correct level.</p> <p>Report to designated person in authority.</p> <p>Report to designated person in authority.</p> <p>Report to designated person in authority.</p> <p>Report to designated person in authority.</p> <p>Clean Screen.</p>



# INDUSTRIAL TRUCK DIVISION



## TROUBLE SHOOTING GUIDE

### TRANSMISSION, CONVERTER AND AXLE ADAPTOR (HYDRATORK DRIVE)

TROUBLE	PROBABLE CAUSE	REMEDY
Transmission Overheating (Continued)	Insufficient oil to Torque Converter and Cooler.	Report to designated person in authority.
	Cooler clogged internally stopping flow of oil.	Clean Cooler.
	Bushing in Torque Converter Impeller Hub worn, allowing oil to leak out.	Report to designated person in authority.
	Slipping Stator.	Refer to Transmission Pressure Checks
Machine has full power and overheats.	Overloading machine.	Check Capacity Loads. Never overload.
	Radiator core clogged externally.	Clean Core.
	Pressure Regulator Valve sticking, giving low pressure.	Report to designated person in authority.