shim adjusted, and their bearings are shielded and permanently lubricated. Two load chains suspend the carriage in the inner upright, and these chains are attached to the carriage by the chain anchors and the anchor pins.

3. Operation

The load carriage moves vertically in the inner upright. Lift is provided by the free-lift hoist cylinder and directly transmitted via the load chains. All rolling motion of the load carriage is accomplished between the floor and the top of the outer upright, the free-lift distance. Fig. 8. Motion of the carriage thereafter is dependent upon upright member extension.

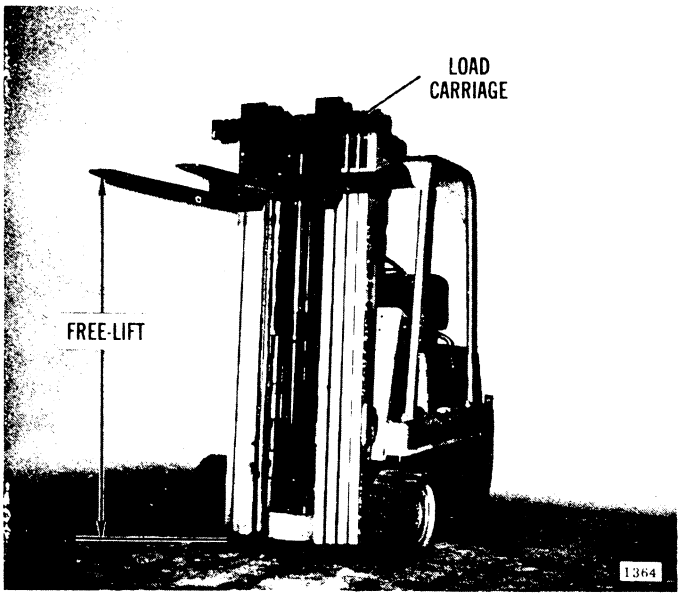

Figure 8

C. Removal

1. Fix hoisting device to lift load carriage and to release tension on load chains.

2. Disconnect load chains by removing the snap rings and anchor pins.

3. Remove the carriage stop at the top of the inner upright to facilitate removal of the carriage through the top of the upright assembly.

NOTE: Carriage removal must be made from top of upright because lower crossmember of inner upright blocks bottom passage.

4. Pull the carriage straight out of the inner upright.

D. Disassembly

1. Remove the snap ring from one stub shaft.

2. Retrieve and note external shim pack. (Keep shims in order.)

3. Remove the load roller and internal shim pack. Inspect the roller for bearing failure and for surface damage.

4. Service remaining rollers by following the same procedure. Replace worn or failed roller assemblies.

E. Assembly and Adjustments

1. Place rollers on the stubshafts with original shim packs or new shims equal to the original and install snap ring.

2. Install the carriage assembly in the inner upright.

3. Adjust shims from one side of the rollers to the other until the carriage is centered and parallel in the inner upright.

NOTE: If the rollers have side clearance then add shims until the rollers are as tight as possible and still permit carriage lowering with no load.

4. Replace the carriage stops.

FREE-LIFT HOIST CYLINDER

A. General

The free-lift hoist cylinder is a single-stage, single-acting, displacement cylinder. It is composed of a cylinder shell, plunger assembly, packing assembly, packing gland, bushing, retainer, relief fitting, O-rings, back-up ring and wiper ring. Fig. 9.

A lowering control valve, composed of a spacer, a spring and a special washer fits into the hydraulic pressure port. The entire free-lift hoist cylinder assembly is mounted on the base of the inner upright in front of the main hoist cylinder. This is the shorter of the two cylinders.

Hydraulic supply to the free-lift cylinder varies from standard routing because a single pressure hose is common to both hoist cylinders. The free-lift hydraulic supply is routed through the main hoist cylinder. Primary use of the hydraulic flow is to pressurize the free-lift cylinder. Although both hoist cylinders are of the same diameter, the free-lift cylinder functions first because it is not lifting the combined weight of the upright channels as does the main hoist cylinder.