SECTION 1
DESCRIPTION OF THE BELT LOADER

The Wollard Belt Loader, Model TC-888, is a belt conveyor with a center-mounted conveyor belt specifically designed to assist airport ground service personnel in the loading and unloading of passenger baggage and cargo. Refer to Section 3 for load capacities, weights and sizes, elevating ranges, etc.

Main Chassis

The chassis is a welded-steel structure containing the operator's station, power pack (engine package) and drive train, stabilizers, and independent hydraulic system. Steering is powered by the independent hydraulic system. The drive train is a conventional rear-wheel design, having a transmission, driveshaft, and differential. The alternator/battery electrical system powers all electrical requirements.

Conveyor Bed Lift Mechanism

Two lift frame weldments, one under each end of the conveyor bed and each actuated by a separate hydraulic cylinder, comprise the bed lift mechanism. Both frames are attached to conveyor bed and chassis by pivot pins.

Conveyor Bed

The conveyor bed is composed of a steel frame upon which the drive roller, tail roller, bed and idler rollers, rubber conveyor belt, and the hydraulic drive components are assembled. The drive roller is driven by a roller chain and sprocket mounted on the hydraulic drive motor shaft. Rotational direction of the motor is controlled by a valve. Rubber bumpers are located at the forward and aft ends of the bed.

Hydraulic System

Figure 1

The hydraulic system powers the conveyor bed lift cylinders, the conveyor belt drive, and vehicle power steering. The system consists of the engine-driven hydraulic pump, oil reservoir, control valves, oil filter, and hydraulic work cylinders (steering and lift); check, flow control and gate valves; and the associated plumbing, fittings and hoses. The following functional units are explained on the next three pages: Conveyor Bed Lift System, Conveyor Belt Drive System, and Power Steering.

Use Mobil DTE-13 in operating temperatures of +20^{O}F to +120^{O}F (-7^{O}C to +50^{O}C).

Use Mobil Aero HFA (MIL-H-5606A) in operating temperatures of -25^{O}F to +50^{O}F (-32^{O}C to +10^{O}C).

Hydraulic Oil Reservoir

The hydraulic oil reservoir is behind the operator's station. The tank is made of welded aluminum to reduce internal corrosion and scale buildup. Working oil capacity is 8.5 U.S. gallons (32 liters). The reservoir is fitted with a magnetic drain plug, sight gauge, and a vented filler/strainer located in the center of a cleanout cover.

A shutoff valve and a 80-mesh external Y-strainer are installed in the suction line between the reservoir and the pumps. A 10-micron filter unit, with a replaceable element and a shutoff valve, is located in the return line.

Hydraulic Pumps

The hydraulic pump is driven by the vehicle engine. It is a fixed-displacement gear-type mounted on the engine. The main pressure relief valve is with the engine package and limits system pressure to a specified setting. All main valves are open-center types which allow unused hydraulic oil to return freely to reservoir when a function is not being used.

Conveyor Bed Lift System

⚠CAUTION Do not use the conveyor bed as a lifting mechanism. The conveyor is designed to support only the specified loads.

Description

The front and rear sections of the bed are raised and lowered by two single-acting work cylinders mounted to the chassis. A check valve on each cylinder locks the cylinder in place when in raised (extended) position. The bed is not powered down; instead, the cylinders retract because of the weight of the bed and scissor assemblies. Check valves allow oil to be diverted from the cylinder blind end directly to the rod end to keep the rod end full of oil when lowering the bed. The counterbalance valve limits lowering speed.

How the Lifts Work

The conveyor bed "Raise" and "Lower" control levers are located to the operator’s right, just below seat level. The two levers are attached to the "Conveyor Bed Up/Down Valve." Pulling a lever up shifts the spool, directing fluid to extend the cylinder, and pushing the lever down shifts the spool in the other direction, directing fluid to retract the cylinder. When the lever is in center position, fluid free-flows through the valve’s open center.

When extending a cylinder, fluid free-flows through the counterbalance valve.

When retracting a cylinder, fluid pressure builds up in the cylinder retract line until it is sufficient to force the counterbalance valve open and allow fluid to escape from the blind end of the cylinder. The counterbalance valve controls pressure in the retract line to prevent the cylinder from retracting too quickly.

Conveyor Belt Drive System

The belt is powered through a chain-and-sprocket reduction by a geroler-type hydraulic motor mounted within the bed frame.

A counterbalance valve in the belt motor hydraulic circuit prevents runaway of heavy packages when in the "Unload" or "Reverse" mode of operation.

Important! Unless the handbrake is applied and the gearshift lever is in neutral position, a bypass valve remains open, disallowing pressure in the belt motor circuit.

Setting the parking brake "On" and placing the gearshift in "Neutral" energizes the solenoid on the bypass valve, closing the bypass valve and forcing fluid to flow through the belt valve.

Operating the belt control lever causes the spool to shift, directing fluid to turn the hydraulic motor either forward or reverse as required.

When running forward, fluid free-flows through the counterbalance valve. When running in reverse, the counterbalance valve remains closed until sufficient pilot pressure builds up and shifts the spool to allow fluid to escape.

A heavy "overrunning" load on the belt will tend to pull the hydraulic motor faster than the pump can supply fluid. This has the effect of reducing pressure going into the motor, which in turn reduces pilot pressure on the counterbalance valve, allowing the spool to start closing. The valve spool will close until it restricts flow out of the motor as much as is required to return the belt to its original speed.

Power Steering System

The steering gear is powered by a gimbal-mounted, double-acting hydraulic cylinder mounted on the front axle. The control unit is actuated directly by the steering wheel to control flow of hydraulic power to the steering cylinder.

Turning the steering wheel actuates the rotary valve in the power steering unit. As the valve opens, hydraulic oil travels into a metering motor within the power steering unit, then out from the motor, through the valve, and out to the retract side of the steering cylinder. Return oil from the extend side flows through the valve to the reservoir. Oil flowing through the metering motor causes it to turn, and as it turns, it moves a feedback linkage that returns the rotary valve to center and locks the steering cylinder in position. The metering motor therefore ensures that the steering cylinder is precisely controlled by the command received from the steering wheel.

In the event of a power failure, steering can be done manually by spinning the steering wheel. In this case, steering wheel movement turns the metering motor directly through the feedback linkage. The motor is then used as a pump to force oil into the cylinder, while drawing oil into the suction side (through check valve) from the return line.