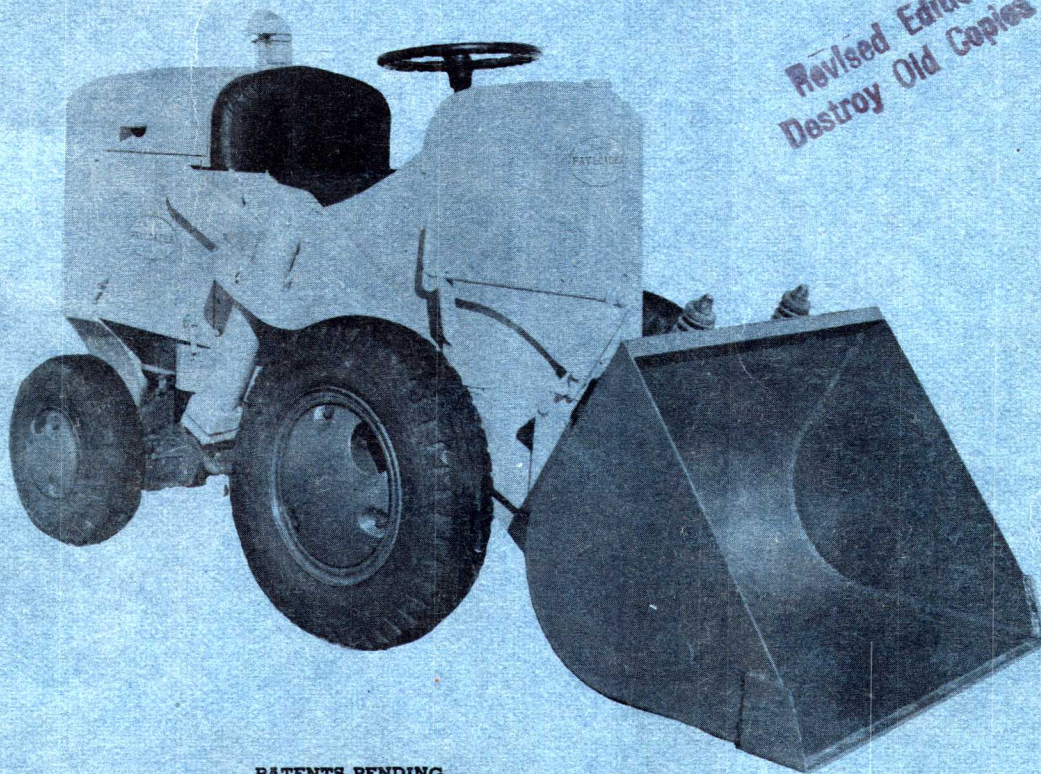


PARTS AND INSTRUCTION DATA
FOR
MODEL HA PAYLOADER

(SERIAL No. 8003 and UP)



PATENTS PENDING

MANUFACTURED BY
THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
U. S. A.

TO THE OWNER

It has been our aim to build the most reliable and serviceable shovel on the market.

Hough shovels have, since 1920, built a reputation for dependable and economical service in the material handling field. This Payloader includes all these features which have made possible long, dependable service, together with the latest engineering knowledge and design.

The purpose of this manual is to explain maintenance requirements and routine adjustments which are necessary for the most efficient operation of your Payloader. Also included in this manual is a parts catalog for your ready reference in repair parts orders. To protect your Payloader investment, study this manual before starting or operating your Payloader.

If you should need information not given in this manual, or require the services of a trained mechanic, we urge you to use the extensive facilities offered by The Frank G. Hough Co. Payloader dealers. Dealers are kept informed on the best methods of servicing and are equipped to provide prompt, dependable service in the field or in an up-to-date service shop.

Dealers carry ample stocks of The Frank G. Hough Co. essential Payloader parts.

Listed below you will find the name of The Frank G. Hough Co. dealer with whom your parts orders should be placed and who should be called upon for any required information concerning proper operating and maintenance procedure.

OUR PAYLOADER DEALER IS:

When ordering parts always give the Frank G. Hough Co. payloader dealer both the name and part number of the part required, and also the serial number of the payloader.

SO THAT YOU MAY HAVE IT BEFORE YOU, WRITE THE PAYLOADER, ENGINE, TRANSMISSION, HYDRAULIC PUMP AND HYDRAULIC VALVE SERIAL NUMBERS HERE:

PAYLOADER SERIAL NO: _____
(Stamped on plate on dash board)

ENGINE SERIAL NO: _____
(Stamped on plate on right hand side of engine)

HYDRAULIC PUMP SERIAL NO: _____
(Stamped on pump body)

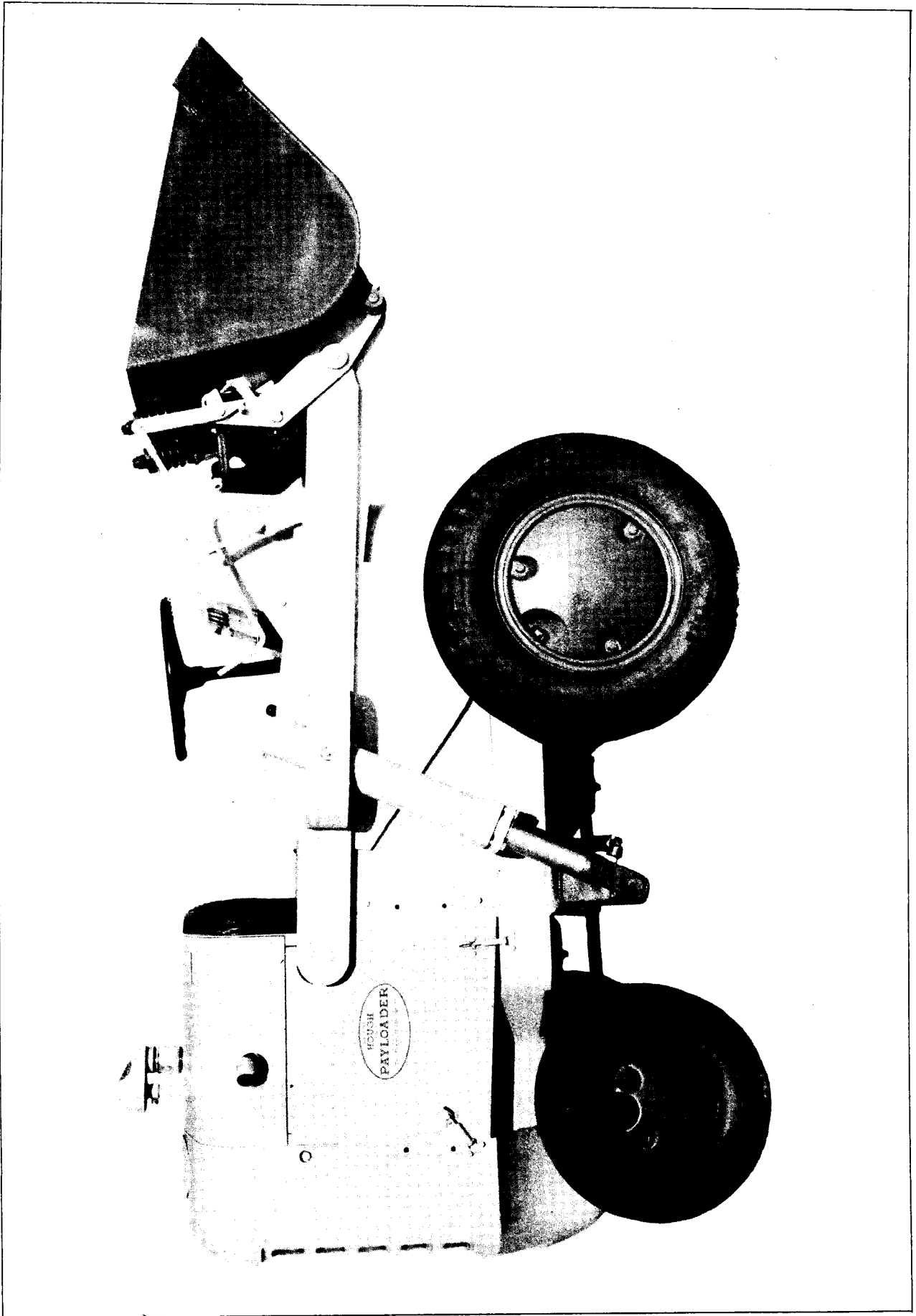
HYDRAULIC VALVE SERIAL NO. _____
(Stamped on valve body)

TRANSMISSION: _____
(Stamped on cover plate)

FINAL DRIVE: _____
(Stamped on housing)

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CONDENSED SPECIFICATIONS - & SERVICE DATA

ENGINE

No. Cylinders 4
Bore 3-1/4"
Stroke 4"
Displacement 133 cu. in.
Speed (Governed) 1800 R.P.M.
Horse Power 29

Complete with electrical starting equipment, oil bath air cleaner with centrifugal type pre-cleaner and engine oil filter.

TRANSMISSION

HOUGH two speeds forward and two speeds reverse, completely equipped with anti-friction ball bearings.

GEAR RATIOS:	FORWARD	REVERSE
Low	2.5 to 1	1.53 to 1 (Reduction)
High	1 to 1	1.64 to 1 (Step up)

FINAL DRIVE:

HOUGH heavy duty double reduction spiral bevel and spur gear design. First reduction spiral bevel with differential ahead of final drive. Full floating axle shafts. Completely equipped with ball and roller bearings.

GEAR RATIO: 22 to 1

PAYLOADER SPEEDS, MILES PER HOUR (ENGINE AT 1800 R.P.M.)

TRAVELING SPEEDS:	FORWARD	REVERSE
Low	2.5	3.5
High	10.0	11.0

CAPACITIES:

Cooling System 3-1/2 gal.
Fuel Tank 6-1/2 gal.
Transmission Case 6-1/2 lbs.
Final Drive Case 15-1/2 lbs.
Crankcase 5 qts.
Hoist Reservoir 8 gal. approx.

BUCKET:

Width 42"
Capacity, Volume 10-1/2 cu. ft.
Capacity, Weight 1000 lbs.
Dumping Clearance 56"
Dumping Angle 30°

CLUTCH:

11" Spring Loaded, Single Plate Dry Disc.

BRAKES:

INTERNAL EXPANDING HYDRAULIC BRAKES ON BOTH FRONT DRIVE WHEELS.

13" Dia. x 2" Wide Brake Band

STEERING:

Heavy Duty Truck Recirculating Ball Type Steering Mechanism.

PNEUMATIC TIRES:

Front (Drive Wheels)	7:00-16	6 Ply
Rear (Steering Wheels)	6:00-9	6 Ply

HOIST TRAVEL SPEEDS:

Raise: 5 sec.
Lower: 3 sec.

PAYLOADER DIMENSIONS:

Overall Height	61"
Overall Width	50-1/4"
Overall Length	9' 6"
Turning Radius	6' 6"
Wheelbase	48-1/2"
Floor Clearance	5"

WEIGHT:

PAYLOADER EMPTY		PAYLOADER WITH 1000 LBS. IN BUCKET	
Front	2450	Front	4310
Rear	1700	Rear	790
Total	4150	Total	5150

SPECIAL ATTACHMENTS: See page 70.

Variations in bucket sizes can be supplied to meet special conditions.

IT IS THE POLICY OF THE FRANK G. HOUGH CO. TO IMPROVE ITS PRODUCTS WHENEVER IT IS POSSIBLE AND PRACTICAL TO DO SO. WE RESERVE THE RIGHT TO MAKE CHANGES OR ADD IMPROVEMENTS AT ANY TIME WITHOUT INCURRING ANY OBLIGATION TO MAKE SUCH CHANGES ON MODEL "HA" PAYLOADERS PREVIOUSLY SOLD.

WARRANTY

This Model HA Payloader is warranted free from defects of material or workmanship for a period of six months from date of sale; it is further warranted to be mechanically practical for the purposes advertised by THE FRANK G. HOUGH CO.

Parts claimed to be defective are to be reported to us promptly and returned to us with transportation charges prepaid. If we find the parts defective upon our examination, credit will be issued or the parts replaced.

This warranty will not apply to machines that have been misused, loaded beyond factory rated capacities, neglected or damaged through accident.

Any expense incurred without authorized consent for repairs or replacement will not be allowed. The use of any but THE FRANK G. HOUGH CO. parts nullifies the warranty.

PREPARATION OF THE PAYLOADER FOR OPERATION

Before operating this Payloader, even to unload, check the entire unit to make sure nothing has become loose or damaged in transit or storage. Battery cables have been disconnected at the factory and the cooling system drained before shipment.

DO NOT ATTEMPT TO START THE ENGINE BEFORE THE FOLLOWING POINTS HAVE BEEN CHECKED OR DAMAGE MAY RESULT.

1. Check the oil level in the hydraulic system reservoir to make sure it is up to the "full" mark on the bayonet gage. The hydraulic system pump is coupled directly to the engine crankshaft and MUST NOT be operated without oil in the hydraulic system. (See Page 54 or 53).
2. Check the oil level in the engine crankcase by removing the oil dip stick from the right hand side of the engine. (See Chart Page 73).
3. Check the oil level in the transmission to be sure it is to the height of the oil level plug on the left side.
4. Check the oil level in the final drive. Oil level plugs of the final drive are located on the rear side of both housing extensions.
5. Check oil in the engine air cleaner cup to be sure it contains the correct amount and grade of oil.
6. Check the master brake cylinder to make sure it is filled with brake fluid. If not fill with "Lockheed" hydraulic brake fluid. (See Page 36).
7. Be sure all hoses and connections are tight to prevent hydraulic oil from leaking out and to keep mud or water from entering the system. Water entering the system will cause pump corrosion at high velocities. (See Page 54 or 56).
8. Check the tire pressures. Be sure they are up to pressures recommended. Keep the valve caps in place and tightened securely to prevent mud, dust and moisture from damaging the valve core. (See Page 23).
9. Fill the cooling system with clean soft water, free from alkaline; never, at any time, run the engine without the full quantity of water in the cooling system. The radiator is fitted with a pressure type cap which must be removed to permit draining.
Capacity of the cooling system is $3\frac{1}{2}$ gallons.
10. Fill the fuel tank using a gasoline with minimum octane rating of 70-72. Capacity of the tank is $6\frac{1}{2}$ U.S. gallons. The fuel tank is located under the front shroud and has a shut off cock attached to the tank at the fuel line connection. (FIG. 1, Page 7).
11. Be sure all drain cocks, drain plugs, filler openings and fuel line connections are tight and do not leak.
12. Connect battery cables and check the dash instruments to be sure they function properly. Check the battery to be sure the plates are covered with water. If not, add distilled water or clean rain water. (See Page 50 or 52).

Before putting this Payloader in operation, it would be wise at this time to write the serial number of Payloader, engine number and serial numbers of the transmission, final drive, pump and valve in the space provided on the inside front cover. This is essential data and will be required when ordering repair parts.

With the Payloader properly serviced and checked, the engine may be started.

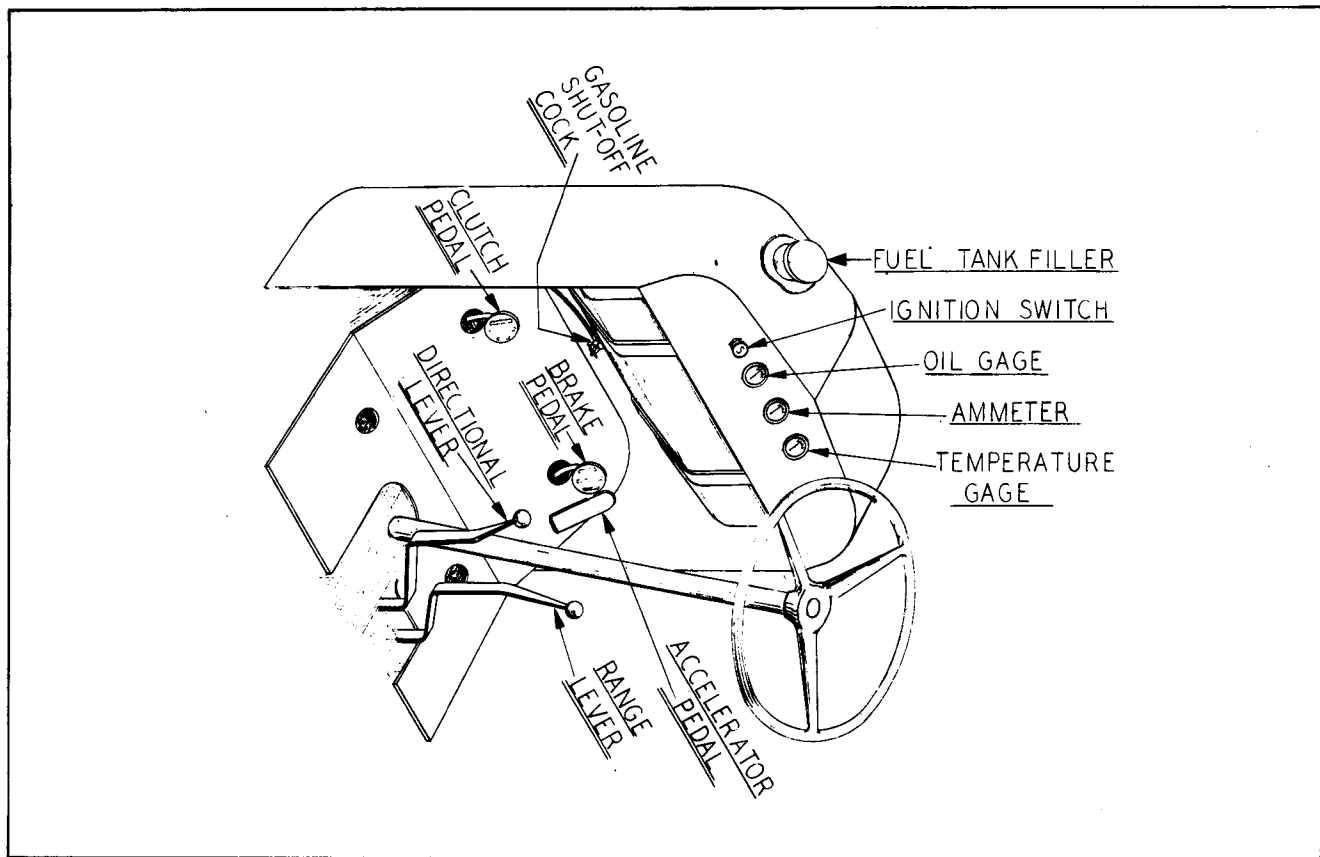


Fig. 1
DASH INSTRUMENTS & CONTROLS

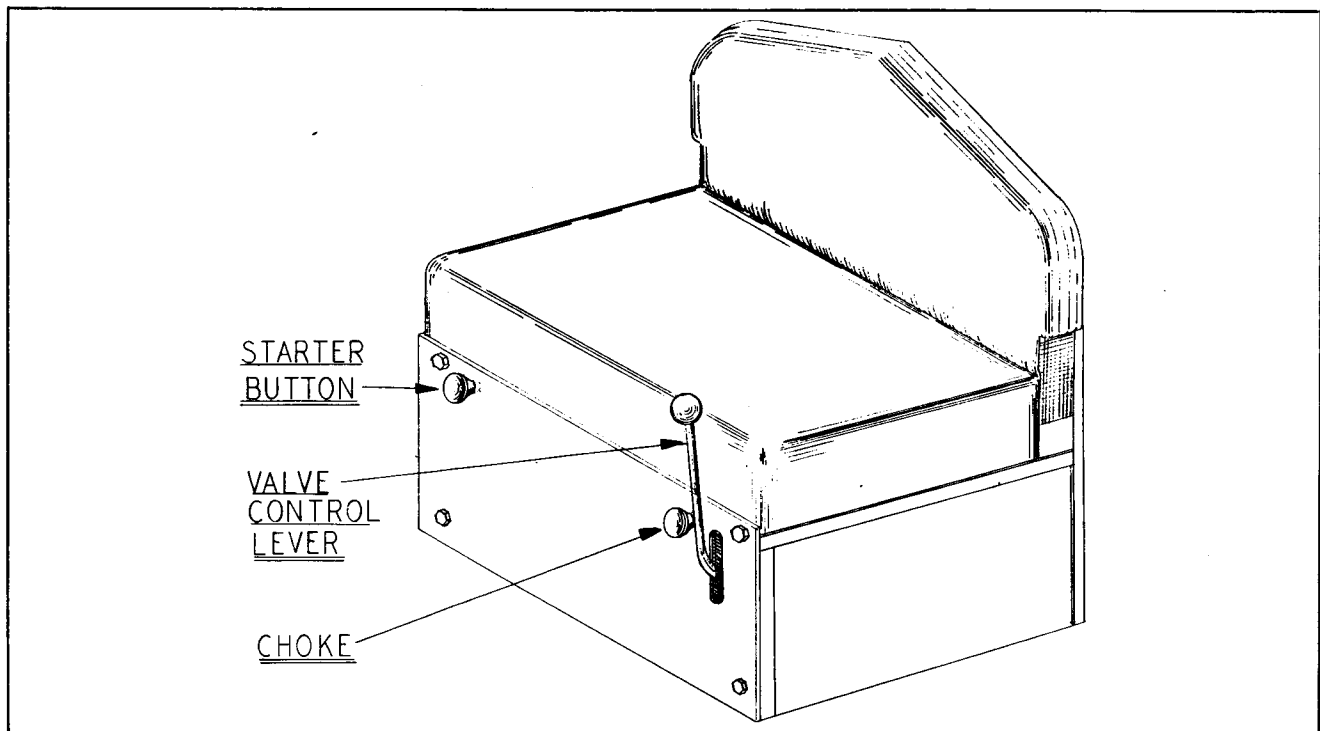


Fig. 2
VALVE LEVER & STARTER BUTTON

OPERATING THE PAYLOADER

DRIVING THE PAYLOADER (See Fig. 1 and 2, page 7).

This Payloader is equipped with a two speed forward and a two speed reverse transmission.

The speeds and direction desired is selected by shifting a RANGE LEVER and a DIRECTIONAL LEVER, located on each side of the steering column.

RANGE LEVER

The RANGE lever is located on the right hand side of the steering column. This lever is in NEUTRAL when it is in a vertical position. When pulled backward from neutral the transmission has been shifted to LOW range. When pushed forward from neutral the transmission has been shifted to HIGH range.

The low speed range is used for working conditions where more power is needed.

The high speed range is used primarily for transporting loads to various locations.

DIRECTIONAL LEVER

The DIRECTIONAL lever is located on the left hand side of the steering column. This lever is in NEUTRAL when it is in a vertical position. When pulled backward from neutral the transmission is in REVERSE gear. When pushed forward from neutral the transmission has been shifted to FORWARD gear.

FOOT PEDALS

The CLUTCH pedal is located on the LEFT side of the directional lever. When pushed down the transmission is disengaged from the engine. Always keep the clutch pedal depressed when shifting either the range lever or the directional lever. DO NOT engage the clutch suddenly, thus allowing the Payloader to jerk with the load. Release the pressure on this pedal slowly allowing the clutch to engage gradually.

CAUTION: DO NOT ATTEMPT TO SHIFT GEARS WHILE THE PAYLOADER IS IN MOTION.

DO NOT DRIVE THE PAYLOADER WITH THE FOOT RESTING ON THE CLUTCH PEDAL. THIS WILL CAUSE UNDUE WEAR ON THE CLUTCH FACINGS AND THROWOUT BEARING.

The BRAKE PEDAL is located on the right side of the range lever and is used to bring the Payloader to a STOP. Depress the brake firmly when braking. It is good practice to keep the clutch engaged until the Payloader has been slowed down and nearly brought to a halt by depressing the brake. Then disengage the clutch and stop the motion of the Payloader completely. This allows the engine compression to assist the brake and saves wear on the brake linings.

The ACCELERATOR pedal is located to the right of the brake pedal. Applying pressure on this pedal increases the flow of fuel to the cylinders by opening the carburetor intake. This increases the engine speed thus accelerating the motion of the Payloader. Apply a slight increasing pressure on the accelerator pedal while slowly releasing pressure on the clutch pedal. This allows the Payloader to start evenly, without jerking. The raising and lowering speed of the booms and bucket is also governed by the accelerator.

DASH INSTRUMENTS

IGNITION SWITCH controls the current to the dash instruments. It is also used in starting and stopping the engine.

AMMETER indicates whether the battery is being charged or discharged. The needle should be in the "charge" range during operation. If in "discharge" range continuously, the cause should be investigated to avoid completely discharging the battery.

TEMPERATURE GAGE indicates the temperature of the liquid in the cooling system. The gage should register in the vicinity of 160° F. for normal operation. Temperature may indicate as high as 200° F. when operating in confined quarters.

OIL PRESSURE GAGE indicates the pounds pressure of the oil circulating through the engine. If this gage fails to register, stop the engine immediately and determine the cause.

CHOKE ROD is used to enrich the fuel mixture. Pull the rod out to choke.

STARTER BUTTON completes the electrical circuit between the battery and the starting motor. Release the pressure on this button as soon as the engine starts. Do not run the starting motor more than $\frac{1}{2}$ minute at one time.

OPERATING THE HOIST

Since the engine also operates the hydraulic pump, the hoists may be used as soon as the engine is started.

The travel of the booms and bucket is controlled by a hydraulic valve which regulates the flow of oil to the rams. This valve has "RAISE", "HOLD", and "LOWER" positions and is operated by a valve control lever located on the left side of the seat support plate.

The bucket is "RAISED" by moving the valve control lever backward, toward the operator's seat. The booms and bucket will raise in proportion to the engine speed.

The "HOLD" is the neutral or centralized position of the valve control lever. The booms and bucket may be stopped and held in any point of travel by placing the valve control lever in the "HOLD" position.

The bucket is "LOWERED" by moving the valve control lever forward or away from the operator's seat.

LOADING THE BUCKET

When loading the bucket the normal operation is to drive the Payloader forward with the bucket down. (Low gear is the best average loading speed). As the bucket fills, it should be raised gradually. This movement, combined with the forward motion of the Payloader will cause an action similiar to a "dipper" stick shovel.

The loading operation should be done on a level or slightly uphill grade if possible.

The inherent tendency is to "dig in" when working down slope. Also, backing up-hill with a load is difficult due to increased weight on the drive wheels.

STARTING THE ENGINE

CAUTION: NEVER ATTEMPT TO START THE ENGINE WITHOUT OIL IN THE HYDRAULIC SYSTEM.

Before starting the engine, place the RANGE lever and the DIRECTIONAL lever in the neutral positions; and the bucket CONTROL lever in the hold position. (See fig. 1 & fig. 2 page 7).

Be sure the gasoline shut off cock is open. (See fig. 1 page 7).

Pull out the ignition switch on the left hand side of the dash and check the ammeter to see that it registers. (Fig. 1 page 7).

Press the starter button located on the right side of the seat plate. The choke rod is located on the left side. (Fig. 2 page 7). If necessary pull the choke rod out slightly to start.

Immediately on starting the engine, check the oil pressure gage to be sure it is registering. If not, stop the engine immediately by pushing in the ignition switch, and inspect the oil system to learn the cause of oil pressure failure.

The oil pressure gage will register between 15 & 20 lbs. at normal operating speeds.

STOPPING THE ENGINE

To stop the engine, merely push on the ignition switch button. Be sure all levers are in neutral position before leaving the seat.

It is advisable to close the fuel line shut-off cock if the Payloader is to remain idle for any length of time.

TRANSPORTING LOADS

For transportation of loads under average conditions it is recommended that the cutting edge of the bucket be held about four (4) feet off the ground. Do not transport loads with the bucket fully raised.

If traveling on a side slope, it is advisable to transport loads with the bucket near the ground as this will give better stability.

DUMPING THE BUCKET

To "dump the bucket", pull back sharply on the bucket trip lever, located on the right hand boom. This action "Trips" or unlatches the bucket hooks and allows the bucket to pivot forward on the hinge pins, dumping the load.

LATCHING THE BUCKET

To "relatch" the bucket, lower the booms and bucket while the Payloader is moving in a reverse direction. As the cutting edge touches the floor or ground, the bucket will pivot on the hinge pins and automatically relatch.

A V O I D A C C I D E N T S

Most accidents, whether they occur in industry, on the farm, at home, or on the highway, are caused by the failure of some individual to follow simple and fundamental safety rules or precautions. For this reason most accidents can be prevented by recognizing the real cause and doing something about it before the accident occurs.

Regardless of the care used in the design and construction of any type of equipment, there are many conditions that can not be completely safe guarded against without interfering with reasonable accessibility and efficient operation.

A CAREFUL OPERATOR IS THE BEST INSURANCE AGAINST AN ACCIDENT.

THE COMPLETE OBSERVANCE OF ONE SIMPLE RULE WOULD PREVENT MANY THOUSAND SERIOUS INJURIES EACH YEAR. THAT RULE IS:

"Never attempt to clean, oil or adjust a machine while it is in motion!"

"National Safety Council"

ROUTINE SERVICE AND INSPECTION

The operating life of the Payloader may be considerably extended and fewer shut downs will be experienced if the unit is properly serviced at regular intervals. Often major repairs or shut downs can be avoided if the Payloader is inspected regularly and trouble corrected while it is of a minor nature.

The following outline gives points which should be lubricated and checked at each inspection period.

For all lubrication points refer to Lubrication Chart and Lubrication Instruction on pages 73-72-71.

TEN (10) HOUR SERVICE

Lubricate

Steering Axle Bell Crank	Brake Pedal
Tie Rod Ends	Clutch Pedal
King Pins	Gear Shift Levers
Spindles	Boom Pivots
Drag Link	Guide Pivots
Radius Rod Pivots	Ram Pivots
Clutch Release Bearing	Latch Shaft
Valve Control Lever	Latch Hooks

Check

Battery	Crank Case Oil Level
Connections	Cooling System Content
Hydraulic Hoses	Air Cleaner
Clutch Pedal Play	

SIXTY (60) HOUR SERVICE

Brake & Clutch Pedal Play	Tighten Nuts & Capscrews
Grease Hydraulic Pump	Clean & Refill Engine Air Filter Cup
Check Hydraulic Oil	Fill Distributor Grease Cup
Flush Cooling System	Clean Transmission Breather
Check Water Pump	Clean Crank Case Breather
Check Oil Level in Master Brake Cylinder	Change Crank Case Oil
Gasoline Line Filter	Lubricate Universal Joints

TWO HUNDRED (200) HOUR SERVICE

Check and Clean Hydraulic Suction Line Strainer	Drain & Refill Hydraulic System Check & Grease Steering Gear
--	---

FOUR HUNDRED (400) HOUR SERVICE

Repack Wheels	Change Final Drive Oil
Flush Hydraulic System	Check Distributor
Change Transmission Oil	Check Wiring Connections

When operating in wet or muddy conditions be sure all connections are tight. Do not allow moisture to enter the hydraulic system.

Never, under any circumstances, pour cold water into a hot engine. To do so may result in cracking the cylinder head or the cylinder block.

COLD WEATHER OPERATIONS

When operating the Payloader in temperatures of 32 F. (0 C.) or lower, there is danger of the water freezing in the cooling system. To prevent this, use one of the anti-freeze solutions shown on chart page 12.

ANTI-FREEZE SOLUTIONS

Percent by Volume	Distilled Glycerine			Ethylene Glycol		
	Freezing Point		Specific Gravity	Freezing Point		Specific Gravity
	0°C	32°F		0°C	32°F	
0%	0	32	1.000	0	32	1.000
10%	-2	29	1.029	-3	26	1.016
20%	-6	21	1.057	-9	16	1.031
30%	-11	12	1.085	-16	3	1.045
40%	-18	0	1.112	-24	-11	1.058
50%	-26	-15	1.140	-35	-31	1.070

IMPORTANT: Do not use alcohol as an anti-freeze as it will boil away at average temperatures. Do not use a calcium chloride solution or any alkaline solution as they are injurious to metal.

Before filling radiator in freezing weather, cover entire radiator, start engine and put in the water immediately. This prevents the water from freezing during the warm up period.

HYDRAULIC HOIST SYSTEM

(See Page 56 or Page 54)

The hydraulic system consists of an oil reservoir, a Vickers vane type pump, a control valve, two rams and the connecting hoses.

The pump draws oil from the reservoir thru the suction line, and forces it thru the high pressure line into the control valve, which is manually regulated by the operator.

In "raise" position the oil is directed into the rams; in "hold" position the oil passes thru the valve to the reservoir; in "lower" position the valve permits the rams to telescope, so that oil from the rams flows back to the reservoir along with the oil coming from the pump.

The pump is protected, by a pressure relief, against severe overloads.

CARE OF HYDRAULIC SYSTEM

1. Check the oil level in the reservoir every ten (10) hours of operation. The level should be to the "full" mark on the bayonet gauge or approximately 3 inches from the top of the reservoir. The bucket should be resting on the ground when the oil level is checked.
2. Check all hoses and connections for leaks every ten (10) hours of operation.
3. Change hydraulic oil after every two hundred (200) hours of operation.
4. A "high" reservoir oil level will result in fouled spark plugs and oil in the air pre-cleaner bowl.

To change oil procede as follows.

DRAINING THE SYSTEM

ALWAYS DRAIN THE SYSTEM AFTER LOADER OPERATION, WHILE THE OIL IS STILL WARM.

1. Remove cleanout cover and filler plug from top of Reservoir.
2. Place a container large enough to hold 7 or 8 gallons directly under the drain plug on the bottom of the reservoir and remove the drain plug.
3. Break the hose connection at the "tee" in the line between the rams to drain the high pressure line.
4. Break the suction line hose connection at the reservoir to drain the low pressure line.
5. When the oil has drained reach into the reservoir and remove the suction line strainer and wash in clean gasoline being sure to remove all particles of dirt. A dirty strainer will retard the oil flow and cause the pump to "howl".
6. Clean out all dirt and sludge which has collected on the bottom of the reservoir.
7. The drain plug is a magnetic type and must be cleaned thoroughly before replacing.
8. Flush the system every four hundred (400) hours of operation. To flush the system refill the reservoir with 3 gals. of kerosene mixed with 2 gals. of lubricating oil. Run the pump for approximately five minutes raising and lowering the bucket at an accelerated speed during this period. Then shut off the engine and drain as before being sure to disconnect the hoses.
9. Clean off all parts of the system, paying special attention to all connection points. Connect all hoses, replace drain plug and hand hole cover. Refill with best grade of SAE 10 oil.

Capacity of the hydraulic system is 6 gals approx. to the "full" mark on the bayonet gauge, approximately 3" from the top of the reservoir.

10. After any work has been done on the hydraulic system or after changing oil, the system must be "bled" or purged of air. This must be done before the loader is again put into operation.

"BLEEDING" THE SYSTEM

Air in the hydraulic system will cause difficulty in controlling the action of the bucket. The booms and bucket will raise and lower with a series of jerks and the rams may chatter. To enable the bucket to act smoothly proceed as follows.

1. Raise the booms and bucket to full height and hold them in this position.
2. Loosen the screw or plug in the upper end of the ram until air begins to escape. Moving the valve control lever alternately between raise and hold positions will cause the air to escape faster. Note that as the air is removed the bucket tends to lower itself thus forcing out air by the weight of the bucket. This must be done on each ram.
3. As soon as air bubbles cease, tighten the bleeder plug securely. Raising the bucket with the bleeder plug opened may cause more air to be drawn into the system.
4. Clean the rams of escaped oil.

HYDRAULIC RAMS

For Ram Assembly on Payloaders of serial number 8003 to 8047 see fig. 3.
For Ram Assembly on Payloaders of serial number 8048 and up see fig. 4.

The hydraulic rams are so constructed that no adjustments are necessary other than to tighten the packing if oil tends to escape. If the packing becomes overly tight, it may seize the rams and prevent the bucket from being lowered. If this occurs loosen the packing gland slightly.

If unable to tighten the packing securely because it has become worn the packing must be replaced. To replace packing proceed as outlined.

1. Drain the hydraulic system.
2. Disconnect hose at ram connection and remove elbow & nipple from the ram plunger.
3. Remove ram from the Payloader and place in a vertical position with the stuffing box up.
4. Remove packing cap and take out old packing and wiper ring. Pay special attention to the order in which old packing was arranged.
5. Be sure to clean out packing recess thoroughly.
6. The packing cap on Payloaders of serial number 8003 thru 8047 contains a seal which must be replaced with a new seal before reassembling.

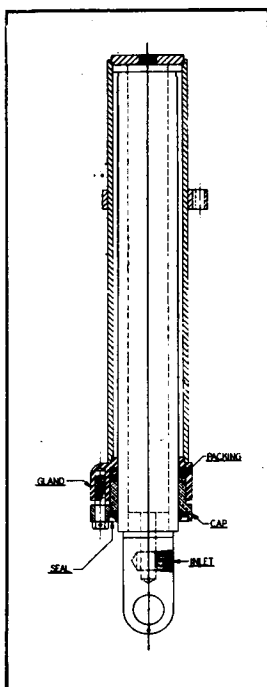


Fig. 3
RAM ASS'Y ON
PAYLOADERS
of Serial Nos.
8003 to 8047

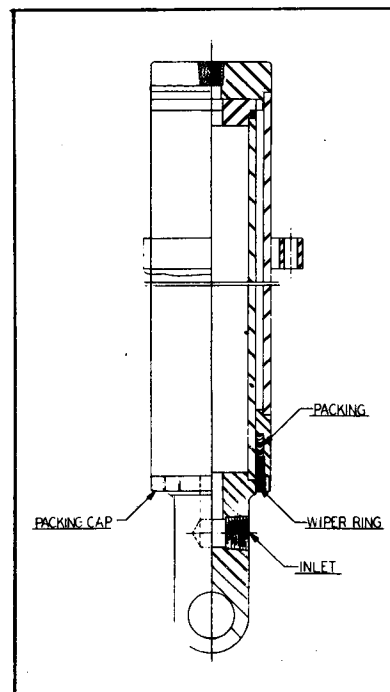


Fig. 4
RAM ASS'Y ON
PAYLOADERS
of Serial Nos.
8048 & up

7. The leather rings and the seal of the replacement packing should be soaked in oil before inserting in the ram. Do not soak the Neoprene rings.
8. Insert the new packing rings in the same order and position in which the old packing had been removed. Make sure each lip is worked down smoothly, an ice pick or similar tool may be used for this purpose. Do not use cut or distorted rings.
9. With the new packing inserted properly, there should be 1/16" to 3/32" compression when the packing cap is tightened.
10. Pull the packing cap down tightly. There is no other adjustment necessary other than retightening the packing cap after the packing rings become worn.

CONTROL VALVE

The function of the control valve is to control the direction of oil flow to raise and lower the bucket and to enable the operator to stop and hold the bucket at any point of travel.

This paragraph pertains to valves used on Payloader of Serial numbers 8003 thru 8047.

It is imperative that the operator and mechanic know the position of the poppets if the system fails to operate due to the valve.

With the valve control lever in "RAISE" position the poppets in both valve chambers must seat solidly. See fig. 5.

In observing fig. 5 note the high pressure poppet is open due to pressure from the pump and is free of the cam shaft.

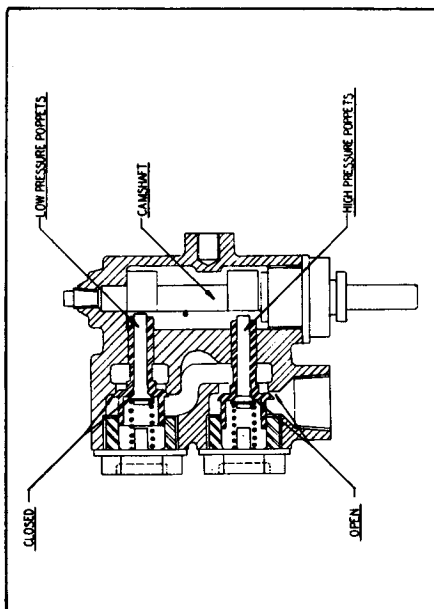


Fig. 5

POPPETS IN "RAISE" POSITION

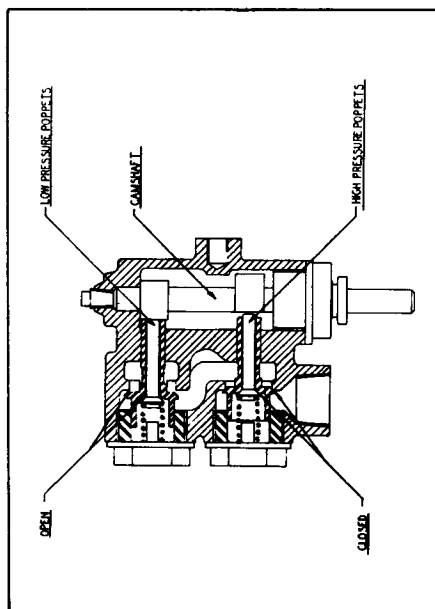


Fig. 6

POPPETS IN "HOLD" POSITION

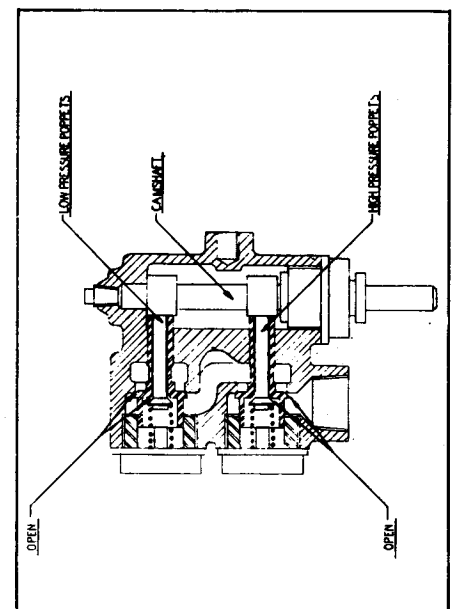


Fig. 7

POPPETS IN "LOWER" POSITION

If the poppets do not seat solidly, remove them from the valve body and grind just enough stock from the lower ends of the poppets so they will not rest on the cam shaft with the valve in "Raise" position. The poppets, both inner and outer, must then be "Lapped" in with regular automotive valve grinding compound, in order to provide a good seat.

NOTE: IF THE ABOVE PROCEDURE IS NECESSARY, WASH AND CLEAN VALVE THOROUGHLY BEFORE OPERATING HYDRAULIC SYSTEM.

With the Valve Control Lever in "Hold" position the high pressure poppet should be closed and the low pressure poppet should be open. (See fig. 6).

With the Valve Control Lever in "Lower" position, both the high and low pressure poppets should be open. (See fig. 7).

HYDRAULIC CONTROL VALVE

(Payloader Serial Nos. 8048 & up)

The type valve used on these machines is a "Hydreco spool valve". (See fig. 8).

There are no adjustments to be made on this valve. It is advisable to remove valve from Payloader, disassemble, wash and clean thoroughly every 400 hours of operation. Use parts drawing on page 61 to identify and locate the various parts of this unit.

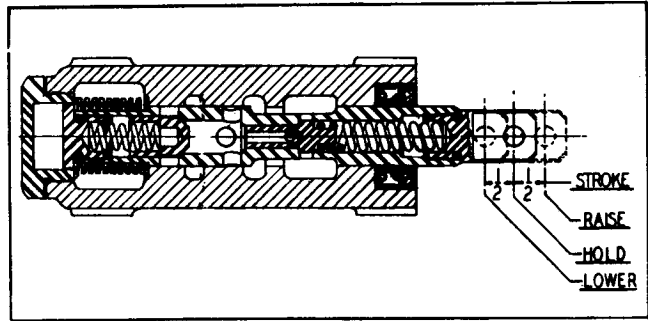


Fig. 8
VALVE ASS'Y PAYLOADERS
of Serial Numbers 8048 & up

HYDRAULIC PUMP

This pump is a "Vickers" Rotary vane type, assembled for left hand operation, and has no volume adjustment. An arrow stamped on the body indicates direction of rotation. The pump must be lubricated every sixty (60) hours of operation with a high temperature sodium soap type grease. There is a grease fitting provided for this on the upper side of the pump body. (See page 58).

Shaft packing of the pump is not subject to pressure and normally does not require replacement.

Vanes, being subject to centrifugal force and fluid pressure, automatically compensate for any normal year.

DISMANTLING AND REASSEMBLING PUMP

Inspection of the pumping cartridge parts in the vane type single pump can be made as follows:

The pumping cartridge consist of a rotor "E", vanes "F" valve plate bushings "D" and "H", and cam ring "G". All moving parts, except shaft and shaft bearings, operate within this cartridge assembly. No moving parts therefore are in contact with the body "T".

Remove the head screws "A" and the head "B". The head end valve plate bushing "D" can then be pulled out, leaving exposed the rotor "E", vanes "F" and the cam ring "G".

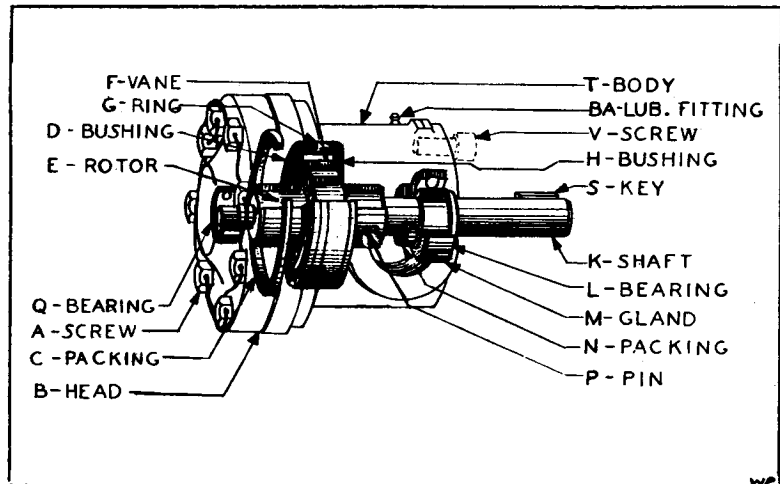


Fig. 9
PUMP ASSEMBLY - SIDE VIEW

Be particularly careful to note the position of the rotor and vanes, also the position of the ring pin "P". These parts may all be reassembled incorrectly if not carefully checked, because of the fact that provision is made in the design for either right-hand or left-hand assembly. The position of cam ring "G" should also be noted carefully.

These parts can all be removed for inspection, and the shaft-end valve plate bushing "H" will then be exposed. It too can be removed by a hook-shaped tool. Parts that show damage or excess wear should be replaced. The vanes can be turned end-for-end so that the inside edge is now against the cam ring-----thus renewing the vanes for future service. Worn edges must be stoned so vanes move freely in rotor slots and beveled edges must trail direction of rotation.

Reassemble in reverse order with parts replaced in original positions, using parts drawing as a supplementary guide. Renew head ring packing "C" if it has become compressed or damaged, otherwise air will be drawn in when the pump is running or oil will leak out when not running. Assemble the pump head so that ring hole registers with protruding part of ring pin "P".

Extreme caution must be taken when reassembling parts to make certain that no grit or lint gets into the vane slots or between assembled parts. Not only may this cause a vane to stick, but it may also cause damage to valve plate bushings. A small amount of foreign matter also will give a false indication of head screw adjustment---thereby impairing pump efficiency. Wash parts in kerosene and use every precaution against dirt.

When reassembling a pump, the head take-up screws, if tightened excessively, can cause binding between the rotor "E" and the two valve plate bushings "D" and "H". It is very important that these take-up screws be drawn up moderately and evenly. Rotate the pump shaft by hand while gradually tightening opposite head screws until all have been pulled up evenly without causing the shaft to bind. Sometimes an additional 1/8 turn is given after the pump has been run a short period. Insert wire through screwheads so that adjustment will be maintained.

The opposite end of the pump must be opened to gain access to the shaft parts, making it possible to then remove the shaft "K" and bearing "L". The stamped steel packing gland "M" and the special cork packing "N" can then be inspected. The cork packing should be renewed to prevent air leakage into the pump or oil leakage out when the pump is not running. When replacing the gland make certain that its outside diameter bears on the outer ball bearing race, and its inside diameter against the cork shaft packing. All of this work may be accomplished without disturbing the head end of the pump.

See the FRANK G. HOUGH CO. Dealer for details on repair and replacements of these pumps.

BUCKET ADJUSTMENT

SNAP SPRINGS AND CHAINS (See Page 68)

Snap springs are mounted on the bucket with snap chains fastened to the spring shafts. The other end of the chains are anchored to a cross member of the loader boom bar. These chains and springs are provided to halt the forward swing and cushion the shock of the bucket when it is tripped.

Be sure the snap chains are the same size and length. If one chain is shorter than the other it will take all the strain when the bucket is dumped and may eventually snap or cause undue wear on the carriers.

Due to war shortages the best grade chain may be unavailable. After the machine has been operated a few days, the chains may lengthen. This added length allows the bucket to swing through an excessive arc, decreasing the dumping clearance and reach. Remove the end link of each chain to restore the dumping clearance and reach.

The castellated nuts on the end of the snap spring shafts must be drawn up to hold the springs under a slight tension and at the same time equalize their length. Keep cotter pins through the nuts and the shaft to maintain adjustment.

LATCH HOOK ADJUSTMENT (See Page 66)

Pulling the trip lever rotates the cam shaft and cams which raise the eyebolts, and pulls the latch hooks out of the pockets. Through usage an eyebolt may become bent and interfere with the proper action of the hook.

Replace bent eyebolts and adjust by turning the two nuts on the upper end of the eyebolts. Lock them so that when the trip lever is pulled back toward the operator's seat the latch hooks clear the pockets by 1/8 inch.

BUCKET SHIMS (See Page 68)

One shim is provided in front of each bucket latch pocket so wear will be taken on them

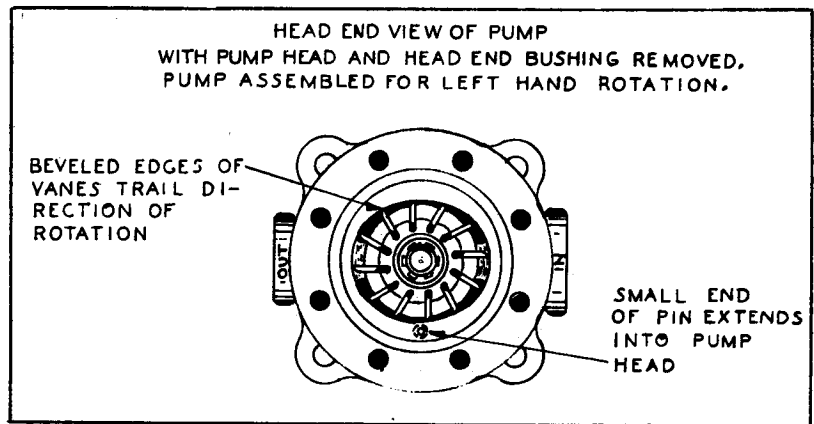


Fig. 10
PUMP ASSEMBLY - END VIEW

and not on the pockets. When the upper edges of the shims become worn they should be inverted or turned end for end, thus keeping a square edge in contact with the latch hook. If this is not done the bucket will not latch properly.

ENGINE

See CONDENSED Specifications & Service Data page 4.

Payloaders, serial no's 8003 thru 8047 have a Waukesha FC157C engine equipped with Magneto ignition system. See page 27.

Payloaders, serial no's 8048 & up have a Waukesha FC157D engine equipped with Distributor* ignition system. See page 30.

A Waukesha FC engine Parts and Instruction manual is inserted in the envelope located on the inside rear cover of this manual.

FUEL SYSTEM

The fuel system of this Payloader is a gravity feed type with the fuel strainer located on the left side of the engine.

A fuel pump may be used on the Payloader which must be a special A-C Spark Plug fuel pump #1538791 and can only be serviced by the FRANK G. HOUGH CO. Dealers or any United Motors service station.

FAN BELT

REMOVING & REPLACING

1. Shut off engine and lower bucket to the floor.
2. Remove hood sides from Payloader.
3. Remove hose clip which attaches to governor on the left hand side of the engine.
4. Remove inspection cover from rear grille casting.
5. Remove the 6 capscrews holding pump drive flange to engine fan belt pulley.
6. Remove four bolts which hold pump to pump mounting bracket.
7. Pull the pump out toward rear of machine as far as it will go.
8. Loosen the generator bracket adjusting nut and push generator in toward the engine and tighten nut.
9. Remove fan belt from generator pulley and lower fan belt pulley; then slip belt over the fan to remove from the machine.

NOTE: THE ABOVE OPERATION MAY BE DONE WITHOUT REMOVING THE RADIATOR GRILLE CASTING.

ADJUSTING FAN BELT

Install the new fan belt by reversing the procedure above. With the fan belt on all three pulleys reset the generator so that the belt can be pushed inward approximately 3/4" to 1". This is the proper tension of the belt when the generator bolts have been tightened.

REMOVING FINAL DRIVE FROM PAYLOADER

By carefully following the instructions as outlined below the final drive and the front drive wheels may be removed from the Payloader as a complete unit. (See Fig. 11).

1. Raise the booms and bucket to almost full raise position, shut off engine and block the booms and bucket in this elevated position.
2. Disconnect hydraulic brake fluid lines at both front drive wheel connection points.
3. Remove the four (4) capscrews that hold torque bracket to front of frame and remove torque bracket.
4. Remove the two (2) capscrews on each side holding the axle carrier caps to the axle carriers.
5. Secure a chain fall to the front of the frame and raise the front end of the loader about 12 inches.
6. Roll front drive wheels along with final drive and universal drive shaft out from under the machine.

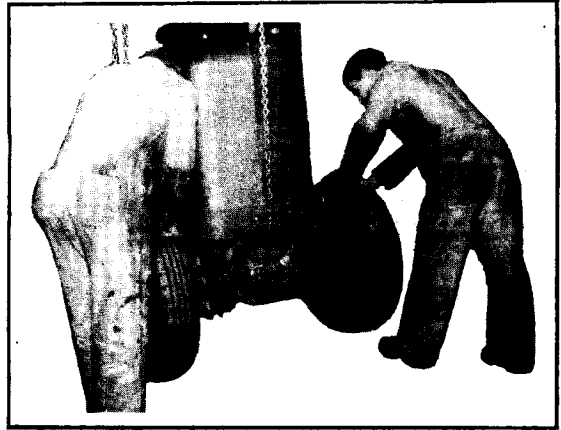


Fig. 11
REMOVING THE FINAL DRIVE

NOTE: THE TRANSMISSION END OF UNIVERSAL DRIVE SHAFT WILL SLIP OFF THE SPLINED END OF THE TRANSMISSION SHAFT.

7. Place supports under the axle hangers on frame and lower the machine so that it will rest steady and level.

REMOVING TRANSMISSION FROM PAYLOADER

The transmission may be removed with the least amount of effort and time by carefully following the instructions as outlined below:

1. Remove the final drive from the Payloader. (See "Removing the Final Drive from Payloader" page 19).
2. Remove seat, seat back and seat support plate.
3. Drain the Hydraulic System completely. (See "Draining the Hydraulic System" page 13).
4. Disconnect all hose connections at Hydraulic Reservoir Connecting points.
5. Disconnect clutch control rod at transmission connection.
6. Disconnect valve control linkage at valve connection.
7. Remove starter and choke rods.
8. Disconnect reservoir bleeder line at reservoir connection and also remove clip from seat support.
9. Remove the six (6) capscrews holding seat support to frame and lift seat support and reservoir from the Payloader as one unit.
10. Remove the directional and range lever operating links from machine.
11. Remove the twelve (12) capscrews holding the transmission housing to the engine flywheel housing and pull the complete transmission out of the machine.

REASSEMBLY OF TRANSMISSION AND FINAL DRIVE TO PAYLOADER

To reassemble the above units to the Payloader, first carefully clean all parts, then reverse the procedure of disassembly.

After the units have been reassembled in the machine it will be necessary to bleed the brakes, (See "Bleeding the Brakes" page 23), and to bleed the hydraulic system. (See "Bleeding the Hydraulic System" page 13).

CLUTCH

SEE BORG & BECK CLUTCH INSTRUCTION FOLDER INSERTED IN THE ENVELOPE ATTACHED TO INSIDE BACK COVER OF THIS BOOK. FOR CLUTCH REPAIRS SEE THE FRANK G. HOUGH CO. DEALER.

This clutch is a single plate dry disc type, no adjustment for wear being provided in the clutch itself. An individual adjustment is provided for locating lever in manufacturing but the adjusting nut is locked in place and should never be disturbed, unless the clutch is dismantled for replacement of parts.

When the clutch pedal is depressed, the release bearing is moved toward the flywheel and contacts the inner ends of the release levers, 5A. (Fig. 12). Each release lever is pivoted on a floating pin which remains stationary in the lever and rolls across a short flat portion of the enlarged hole in the eyebolt, 5C. (Fig. 12). The outer end of each release lever engages the pressure plate lug by means of a strut, 5E, which provides knife-edge contact between the outer end of the lever and the lug. The outer ends of the eyebolts extend through holes in the stamped cover, 9, (Fig. 13) and are fitted with adjusting nuts to correctly position the levers.

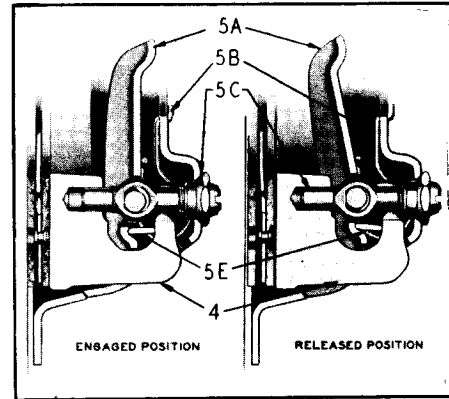


Fig. 12
RELEASE LEVER SECTION

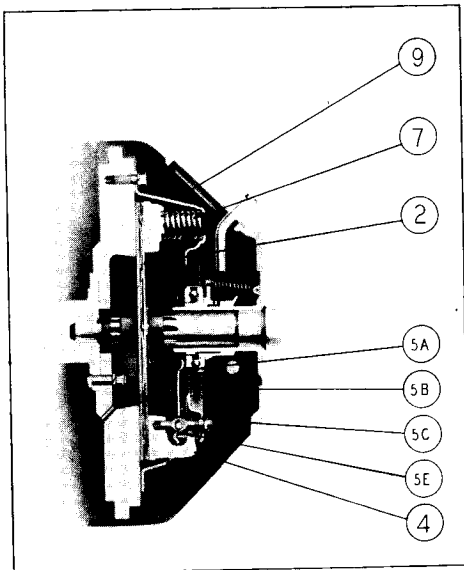


Fig. 13
CLUTCH SECTION

REMOVING THE CLUTCH FROM PAYLOADER

To remove the clutch from the Payloader follow this procedure:

1. Remove the final drive from the Payloader. (See "Removing the Final Drive from Payloader" page 19).
2. Remove the transmission from the Payloader. (See "Removing the Transmission from the Payloader" page 19).
3. Remove the eight (8) capscrews holding the clutch pressure plate to the engine flywheel. Pull clutch pressure plate away from the flywheel and clutch drive plate assembly will also fall away.

INSTALLING CLUTCH

Reverse the procedure outlined above to reassemble the clutch to the Payloader. Be sure all parts are clean and be sure to tighten all bolts and capscrews securely when reassembling.

ADJUSTING CLUTCH PEDAL

The clutch pedal must have 1 to 1½ inches of free play (Fig. 14). Clutch wear decreases this clearance. It is imperative that the pedal be readjusted at frequent intervals to obtain this clearance.

Free pedal play is the amount of movement of the clutch pedal before the clutch release bearing contacts the clutch release levers or fingers.

To readjust the clutch pedal remove the clevis pin and turn the clevis to lengthen the clutch control rod until the necessary free movement of the clutch pedal is obtained. It may be necessary to adjust the clevis several times before the proper free movement is reached.

Be sure to tighten the adjusting nut against the clevis end to lock it in place.

The importance of proper use of the clutch pedal during Loader operation cannot be too highly stressed. This pedal should never be depressed except during the time required to shift gears.

"Riding" the clutch has two serious results. It causes rapid wear of the clutch release bearing and, due to the tendency to "feather" the clutch, results in excessive and premature wear of the clutch disc.

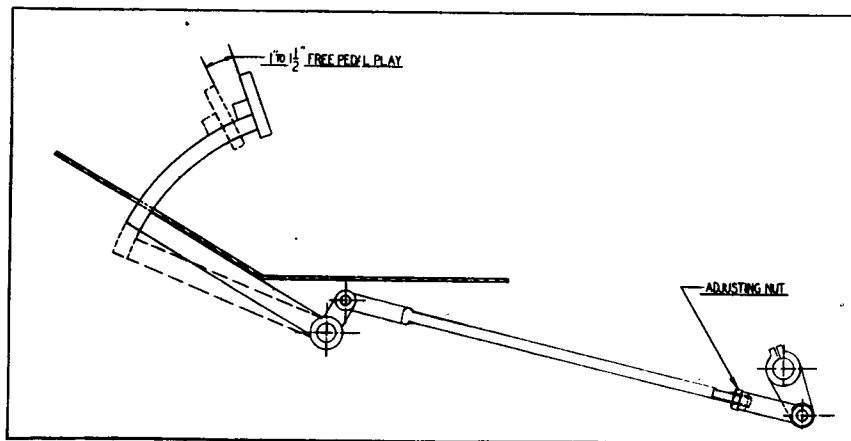


Fig. 14
CLUTCH PEDAL ADJUSTMENT

UNIVERSAL DRIVE SHAFT

The universal joint used in this machine is a Blood Brothers Model BW2 Double Center Joint.

There are no adjustments to be made on this joint. It is imperative that it be kept well lubricated. (See Lubrication Chart, page 73 and Lubrication Instructions, page 71).

STEERING GEAR

Correct adjustment of the steering gear is very important. While there are but two adjustments to be made, the following procedure must be followed step by step. Figures 15 and 16 referred to in the following adjustment procedure, are found on page 21 & 22.

1. Disconnect steering connecting rod from pitman arm, taking care to note relative positions of steering connecting rod parts before disturbing them.
2. Disconnect upper steering column brace, making sure that there is no bind in the column due to anchorage.
3. Loosen lock nut "A", fig. 16 and turn lash adjuster "B", fig. 16, a few turns in counter clock-wise direction. This removes from screw bearings the load imposed by close meshing of rack and sector teeth. Turn steering wheel GENTLY in one direction until stopped by gear, then back away about one turn. Do not turn steering wheel hard against stops when gear is disconnected; damage to ball guides may result.
4. Measure the pull at the rim of the wheel which is required to keep the wheel in motion. This pull can be measured by attaching a spring scale to the wheel with a piece of cord, then pulling on the spring scale to turn the wheel. The line of the scale should be kept tangent to the rim of the wheel. The proper value of the pull at the wheel under these conditions is 1 - 1½ lbs. If the actual value does not lie between the limits specified, adjustment of the screw bearings is necessary.

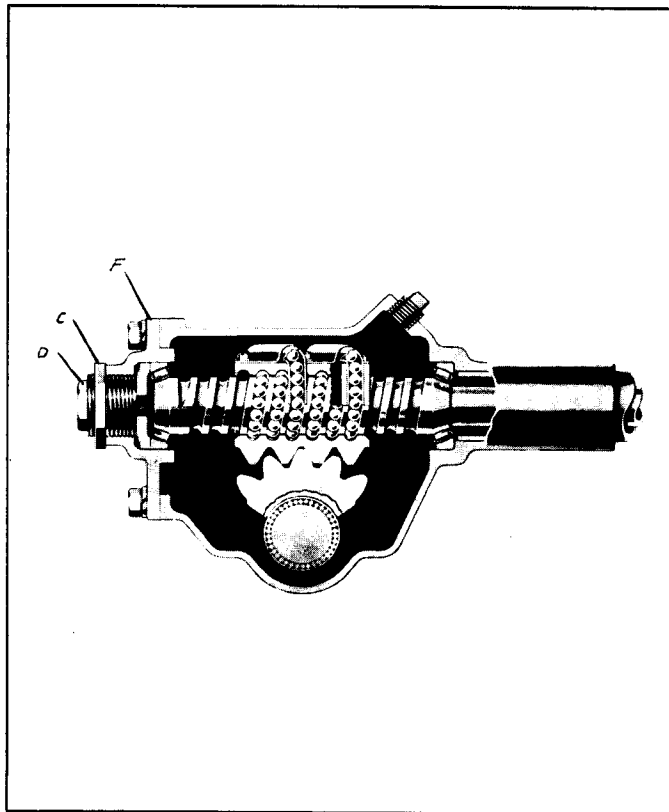
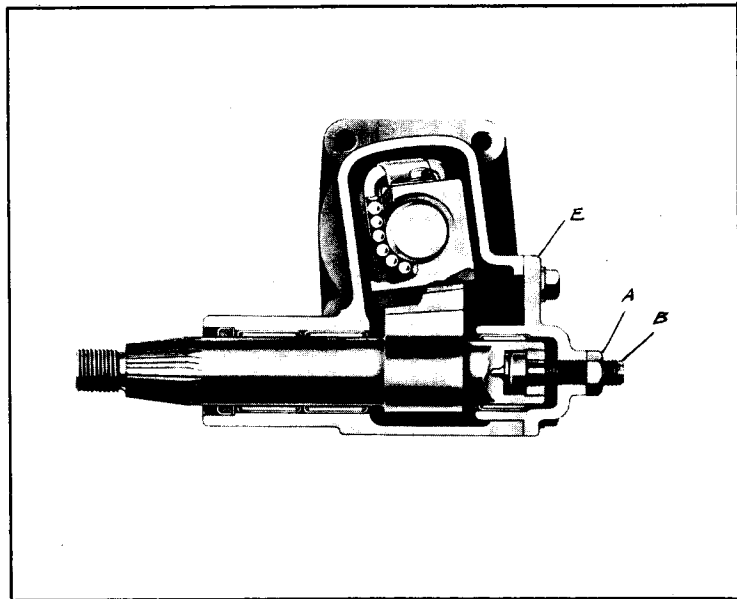


Fig. 15
THRUST BEARING ADJUSTMENT

5. To adjust screw bearings, loosen lock nut "C", fig. 15 and turn screw bearings adjuster "D", fig. 15 clockwise until there is no perceptible end play in screw. Check pull at wheel rim as above, readjusting, if necessary, to obtain proper pull. Set up lock nut "C", and recheck pull, as it must lie within the specified limits AFTER the lock nut is set up.

6. To continue the adjustment procedure, next make sure that it will not be necessary to spring the steering column to fasten it at upper end anchorage. It may be necessary to loosen gear at the frame mounting and shift the gear slightly or to do some shimming at frame mounting or at upper end. Mounting bolt should, of course, be tightened securely after this is done. Tighten column at upper end anchorage, and recheck pull at wheel rim. If this has increased materially, there is still a sprung condition in the column, which must be corrected before proceeding.



**Fig. 16
LASH ADJUSTMENT**

7. After proper adjustment of screw bearings is obtained, and all mounting bolts are securely tightened, adjust lash adjuster "B". First turn steering wheel GENTLY from one stop all the way to the other, carefully counting the total number of turns. Then turn the wheel back exactly half way, to center position. Mark wheel at top or bottom center with a piece of tape. Turn lash adjuster "B" clockwise to take all lash in the gear teeth, and tighten lock nut "A". Check pull at wheel rim as before, taking the highest reading of the spring scale as the wheel is turned through the center position. Proper value of pull is 2 - 2½ lbs. Readjust if necessary to obtain proper pull. Set up lock nut "A", as it must lie within the limits specified AFTER the lock nut is set up.

8. Reassemble steering connecting rod to pitman arm.

LUBRICATION OF STEERING GEAR

The steering gear is filled at the factory with a special steering gear lubricant developed for both summer and winter operation. Seasonal change of lubricant and draining is not necessary.

Gear should be kept filled to level of filler opening with correct lubricant. (See Lubrication Chart, page 73 and Lubricating Instruction, page 71).

REAR WHEEL TOE-IN ADJUSTMENT

Since the rear wheels of the Payloader are also the steering wheels, the toe in must be adjusted toward the front of the machine. At first glance the toe in may seem to be the reverse of a front wheel steering type but is essentially the same.

The steering arrangement is of a twin tie rod type and both tie rods must be adjusted to equal length. Toe-in should be 0" to 1/8" or approximately 1/16" toe-in for each wheel.

TIRES - FRONT & REAR

Tires and tubes are not sold for replacement by the FRANK G. HOUGH CO. but must be purchased locally.

The rear or steering wheel tires are 6.00 x 9 - 6 ply Pneumatic Industrial type. Tubes are fitted with a TR50 hand bendable valve stem of 3/8 offset.

The front or drive wheel tires are 7.00 x 16 - 6 ply truck air wheel type. Tubes are fitted with hand bendable valve stems.

TIRE PRESSURES

Front Drive wheels-----40 lbs. per sq. in.
Rear Steering wheels-----50 lbs. per sq. in.

Air pressures must not be allowed to drop below these recommendations. Tires should be checked every 10 hours with a low pressure gauge.

CHANGING TIRES

To change tires on the front wheels, jack up the front axle, deflate the tire and remove rim locking ring.

To change the rear wheel tires, raise the rear end of the Payloader and remove the hub cap.

Deflate the tire and remove the grease cap.

CAUTION: DO NOT ATTEMPT TO TAKE THE WHEEL APART UNTIL ALL AIR IS OUT OF THE TUBE.

The tire is mounted on a wheel which consists of two halves bolted together. Remove the 5 bolts holding the wheel to the hub and remove the 8 bolts holding the two halves of the wheel together. This frees the tire.

BRAKES

The foot or service brakes are of the "Lockheed" two shoe double anchor type. The shoes are of the internal expanding type, hydraulically actuated in both front drive wheels.

ADJUSTING THE BRAKES

When the brake becomes worn as indicated by the foot pedal going almost to the toe board board, the necessary adjustment can be readily made as described in the following paragraphs.

The adjustment is made on the brake itself by turning the eccentric toward the brake drum until the wheel is tight, then backing the eccentric screws off just enough to let the wheel turn free. The anchor bolts are adjusted in assembly and should not be touched unless the brake shoes are replaced. (See Fig. 17 & Fig. 18).

If new brake shoes have been installed the brakes should be so adjusted that there is .010" clearance between the shoe and the drum.

There is a "feeler" gage slot located in the wheel hub for this adjustment.

BLEEDING THE BRAKES

The hydraulic brake system must be bled whenever a fluid line has been disconnected or air gets into the system. An "air-bound" brake system is indicated by a "spongy" brake pedal. Air trapped in the system is compressible and does not permit pressure applied to the brake pedal to be transmitted solidly through to the brakes. The system must be absolutely free of air at all times.

When bleeding the brakes, it is advisable that the longest fluid line from the master cylinder be bled first. The proper sequence of bleeding the brakes is first the left front drive wheel, then the right front drive wheel. During the bleeding operation the master cylinder must be kept at least 3/4 full of hydraulic brake fluid.

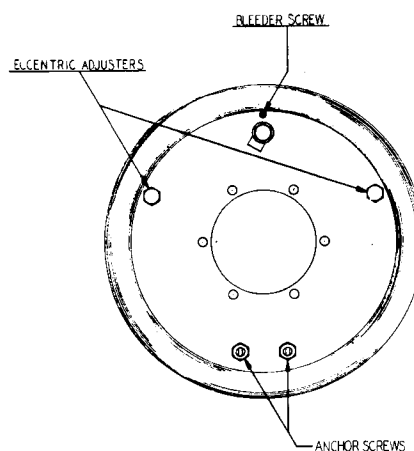


Fig. 17
BRAKE SHOE ADJUSTMENT

BRAKE PEDAL ADJUSTMENT

NOTE: FREE PEDAL PLAY MUST BE $\frac{1}{8}$ " TO $\frac{3}{16}$ ". THE ADJUSTMENT IS MADE ON THE MASTER CYLINDER PUSH ROD. (See Fig. 18).

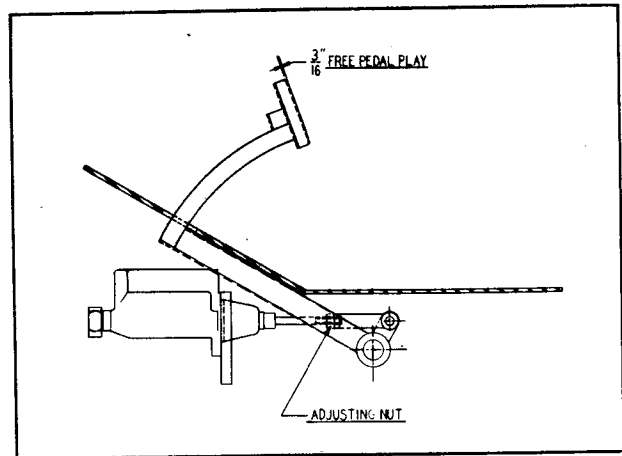
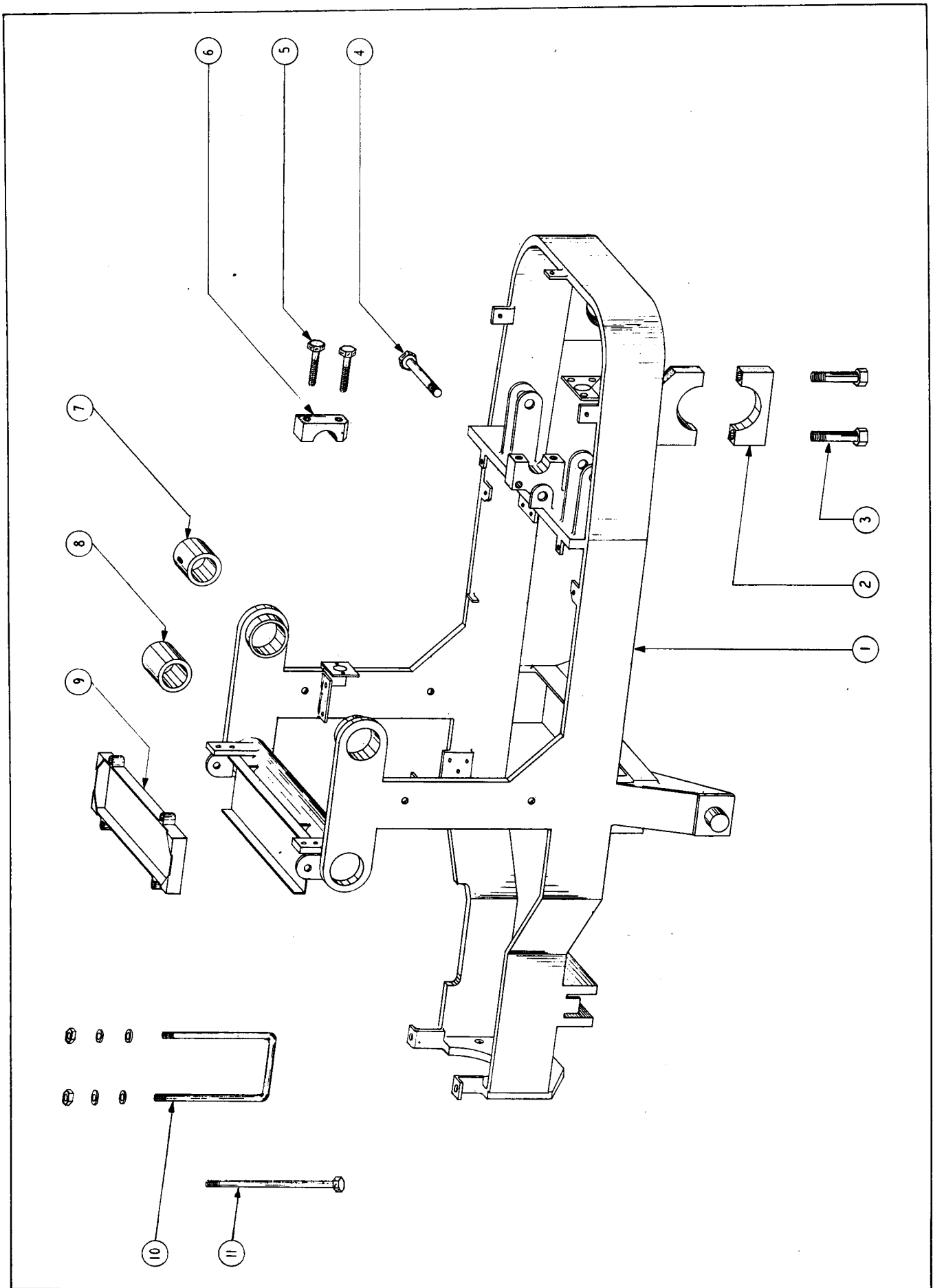


Fig. 18
BRAKE PEDAL ADJUSTMENT

PARTS LIST AND ILLUSTRATIONS

THE FOLLOWING PAGES CONTAIN PARTS LIST AND ILLUSTRATIONS OF "EXPLODED" VIEWS OF THE VARIOUS UNITS DISASSEMBLED SO THAT PARTS WANTED MAY BE READILY LOCATED. ITEM NUMBERS ARE ONLY SHOWN IN THE ILLUSTRATIONS AND, TO AVOID ERRORS AND DELAYS *when ordering parts, always use the regular "part number" SHOWN WITH THE "ITEM NO". Do not use reference number when ordering repair parts.*

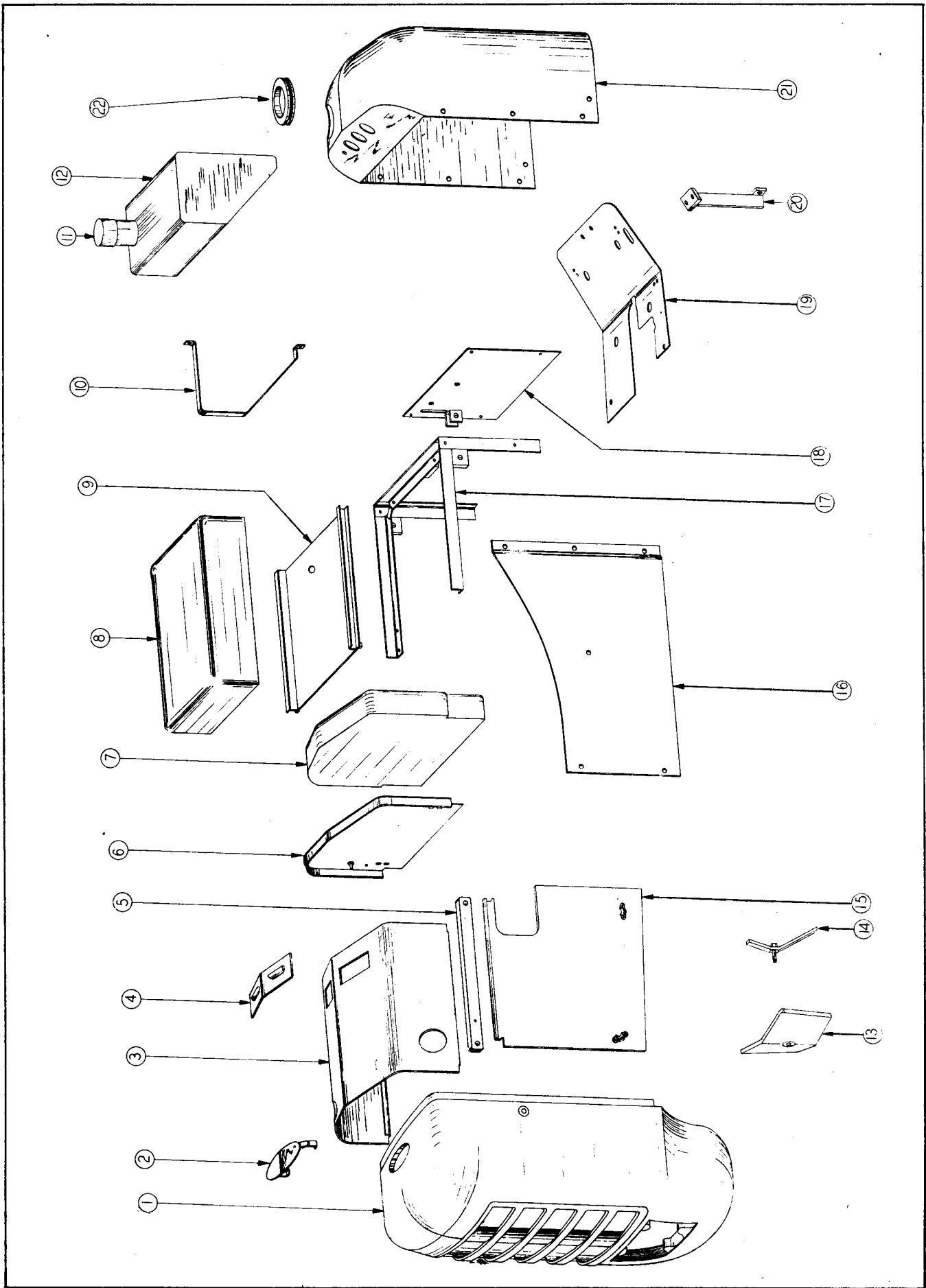
SEND ALL ORDERS FOR REPAIR PARTS TO OUR DEALERS. (*See inside of front cover*).



FRAME GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-142	Frame.	8003	up	1	
2	HA-769	Cap - Axle Hanger.			2	
3	HA-959	Bolt - Axle Hanger			4	
4	HA-960	Bolt - Steering Gear Housing			1	
5	Bolt - Steering Support Cap - 1/2-13 NC x 2-1/2 lg.			2	
6	HA-770	Cap - Steering Gear Support.			1	
7	HA-865	Bushing - Guide Pivot.			2	
8	HA-866	Bushing - Boom Pivot			2	
9	HA-945	Battery Retainer	8003	8327	1	505559
9	101868	Battery Retainer	8328	up	1	
10	102103	"U" Bolt - Battery Retainer.	8328	up	2	
11	HA-947	Bolt - Battery Retainer.	8003	8327	2	126982

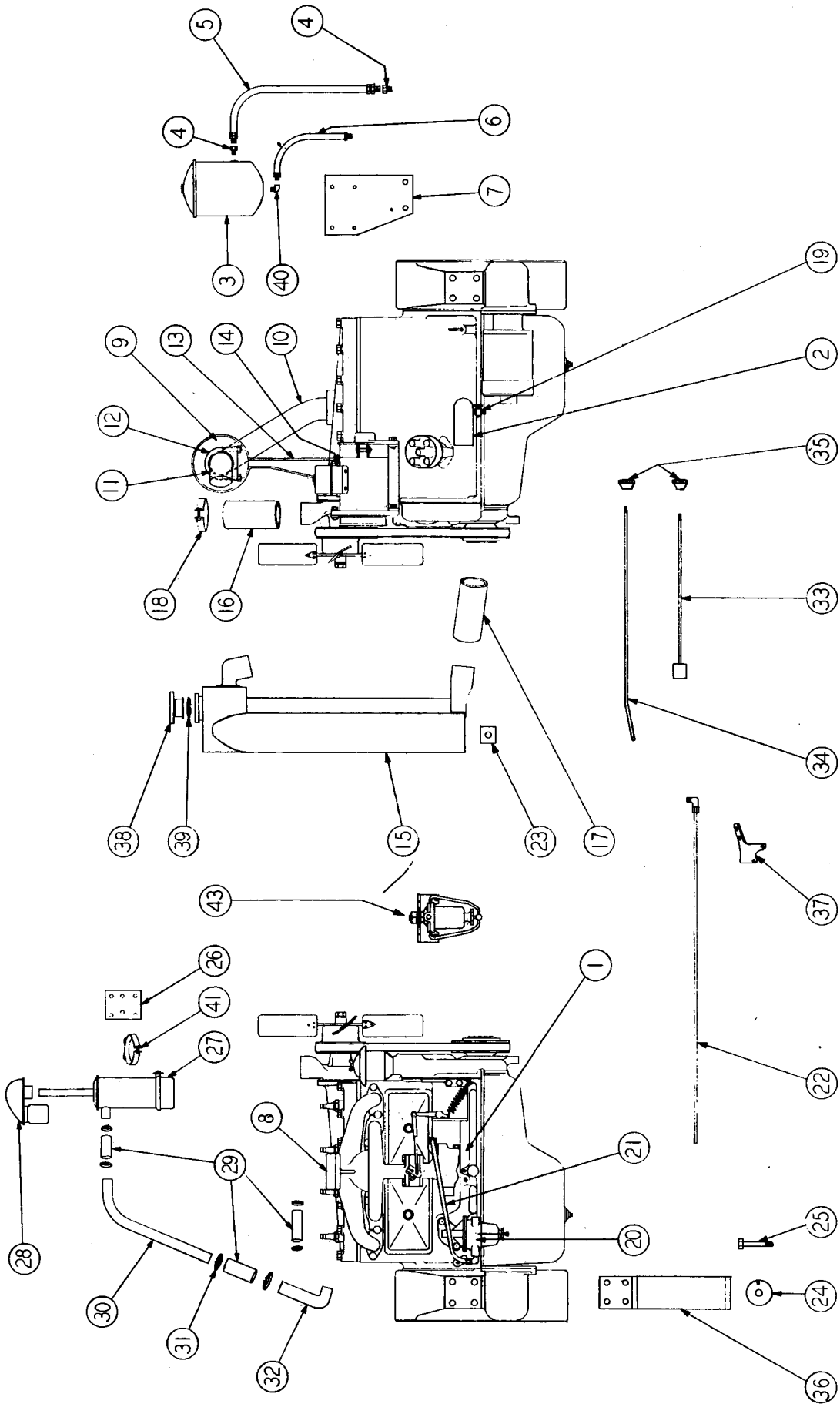
Be sure to give Serial Number of Payloader when ordering Repair Parts.



BODY GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-478	Grille - Radiator			1	
2	HA-917	Cover - Grille			1	
3	HA-1310	Hood			1	
4	HA-1311	Battery Inspection Cover			1	
5	HA-1048	Grille Tie Bar - R.H.			1	
5	HA-951	Grille Tie Bar - L.H.			1	
6	HA-741	Seat Back Support			1	
7	HA-809	Seat Back Cushion			1	
8	HA-1030	Seat Cushion			1	
9	HA-547	Seat Cushion Support			1	
10	HA-1402	Strap - Gas Tank	8387	up	2	
10	HA-747	Strap - Gas Tank	8003	8386	2	
11	HA-1279	Cap - Gas Tank			1	#15-12
12	HA-767	Gas Tank			1	
13	HA-1483	Pump Cover - Grille - (HA-1480 must be ordered with this part for Serial No's 8003 thru 20103).			1	
14	HA-1480	Clamp - Pump Cover	20104	up	1	
		Nut - Clamp - 1/2-13 NCTHD Jam Nut			1	
15	HA-1312	Hood Side - R.H.			1	
15	HA-1313	Hood Side - L.H.			1	
16	HA-717	Side Shroud - R.H.			1	
16	HA-718	Side Shroud - L.H.			1	
17	HA-736	Seat Support Frame			1	
18	HA-1099	Front Plate - Seat Frame	8048	up	1	
18	HA-745	Front Plate - Seat Frame	8003	8047	1	
19	HA-746	Floor Board (order HA-1066, HA-1067 & HA-1388 with this Floorboard for Payloaders of Serial No's 8003 thru 8047).			1	
20	HA-853	Floor Board Support			1	
21	HA-1401	Front Shroud (order must include Item 10 for Payloader Serial No's 8003 thru 8386).			1	
22	HA-1360	Rubber Grommet - Gas Tank Filler Neck.			1	
	HL-3635	Hood Clamps (not shown).			4	S-10

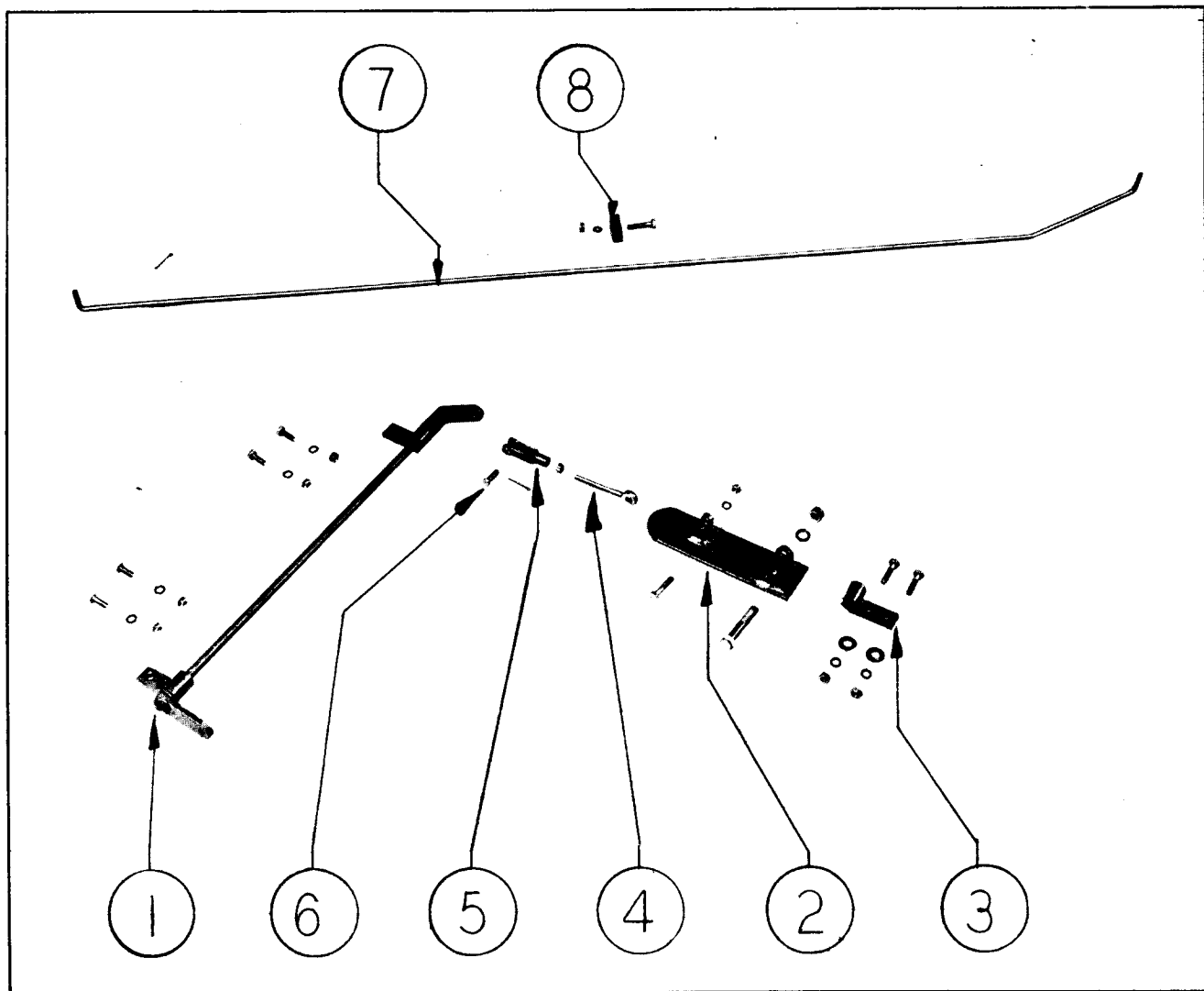
Be sure to give Serial Number of Payloader when ordering Repair Parts.



ENGINE GROUP

SEE ENGINE MANUAL & PARTS LIST INSERTED IN ENVELOPE ON INSIDE REAR COVER

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-330	Engine - Waukesha - Magneto Ignition System.	8003	8047	1	FC-157-C
1	HA-1005	Engine - Waukesha - Battery Ignition System.	8048	up	1	FC-157-D
2	HA-1004	Water Inlet Elbow.			1	
3	HS-262	Oil Filter with C-4 Cartridge.			1	F-413
4	HS-974	Connector - Oil Filter To Engine	8048	up	2	#42
4	HA-791	Fitting - Oil Filter To Engine	8003	8047	2	#69F
5	GH-822	Hose - Oil Filter To Engine.	8048	up	1	L-19-FS
5	HA-900	Tubing - Oil Filter To Engine.	8003	8047	1	
6	HS-394	Hose - Oil Filter.	8048	up	1	L-9
7	HA-250	Bracket - Oil Filter	8003	8047	1	
7	HA-1059	Bracket - Oil Filter	8048	up	1	
8	HA-1044	Exhaust Flange			1	
9	HA-331	Muffler.			1	T-2035-B
10	HA-768	Pipe - Manifold To Muffler			1	
11	HA-909	Exhaust Outlet			1	
12	HA-910	Clamp - Exhaust Pipe			2	X18
13	HA-337	Bracket - Muffler Support.			1	
14	HA-1020	Spacer - Muffler Support			2	
15	HA-159	Radiator			1	R-2395
16	HA-351	Radiator Hose - Upper.			1	
17	HA-353	Radiator Hose - Lower.			1	
18	HA-352	Hose Clamp			4	
19	HA-1006	Drain Cock			1	Type 3-K
20	HA-714	Fuel Pump (Discontinued - See Item 43)	8003	20250	1	1538791
21	HA-1007	Fuel Line - Carburetor To Pump (Order HA-928 also).	8003	20250	1	
21	HA-1500	Fuel Line - Carburetor To Strainer (order HA-928 also).	20251	up	1	854141
22	HA-1008	Fuel Line - Tank To Pump (Order HA-928 & HA-963 also).	8003	20250	1	
22	HA-1502	Fuel Line - Tank To Strainer (Order HA-928 & HA-963 also).	20251	up	1	
	HA-928	Elbow - Fuel Line.			2	#69F
	HA-963	Needle Valve - Fuel Line			1	29910 DX
23	HA-1023	Pad - Radiator Mtg.			2	
24	HA-1023	Pad - Engine Support			3	
25	HA-944	Bolt - Engine Mtg.			3	
26	HA-1024	Plate - Air Cleaner Support.			1	
27	HA-674	Air Cleaner.			1	A-450
28	HA-675	Pre-Cleaner.			1	X1523
29	HA-356	Hose - Air Cleaner (2 req'd on S/N 8003 to 8047)			3	
30	HA-1317	Tubing - Air Cleaner	8048	up	1	
30	HA-355	Tubing - Air Cleaner	8003	8047	1	
31	HA-354	Clamp - Air Cleaner Hose			6	
32	HA-1296	Adapter Casting - Air Cleaner Tube	8048	up	1	
33	HA-887	Push Rod - Starter Switch.			1	
34	HA-974	Choke Rod.			1	
35	HL-3562	Knob-Choke & Push Rods			2	
36	HA-1420	Clip - Engine Support.	20551	up	2	
36	HA-249	Leg - Engine Support	8003	20550	2	
37	HS-617	Horn Bracket			1	1872391
38	HA-1274	Radiator Cap			1	G-13540
39	HA-1320	Gasket - Radiator Cap.			1	G-24154
40	HS-898	Connector - Elbow - Filter			1	43
41	HA-1017	Band - Air Cleaner			1	X1523
42	HA-1407	Washer - Engine Mtg. (Not shown)			3	
43	HA-1471	Strainer - Fuel Line	20251	up	1	854141
	HA-1422	Capscrew - Eng. Mtg.			2	
	HA-1337	Hose - Air cleaner Tube (Not shown).			2	
		The following engine accessories and parts given with the manufacturers Part or Model Number, should be purchased thru local Dealers, wherever possible.				
		Coil - Delco Remy 528C			1	
		Carburetor - Stromberg UR3/4 or Zenith 193½.			1	
		Distributor - Delco Remy 625F or			1	
		Distributor - Auto-Lite IGW4301.			1	
		Generator - Delco Remy 1101381	8048	up	1	
		Magneto - American Basch MJC-4C.	8003	8047	1	
		Spark Plug - Champion #8 Commercial.			4	
		Starter - Delco Remy 739B or			1	
		Starter - Auto Lite MZ-4027A			1	
		Voltage Regulator - Delco Remy 5851.	8048	up	1	

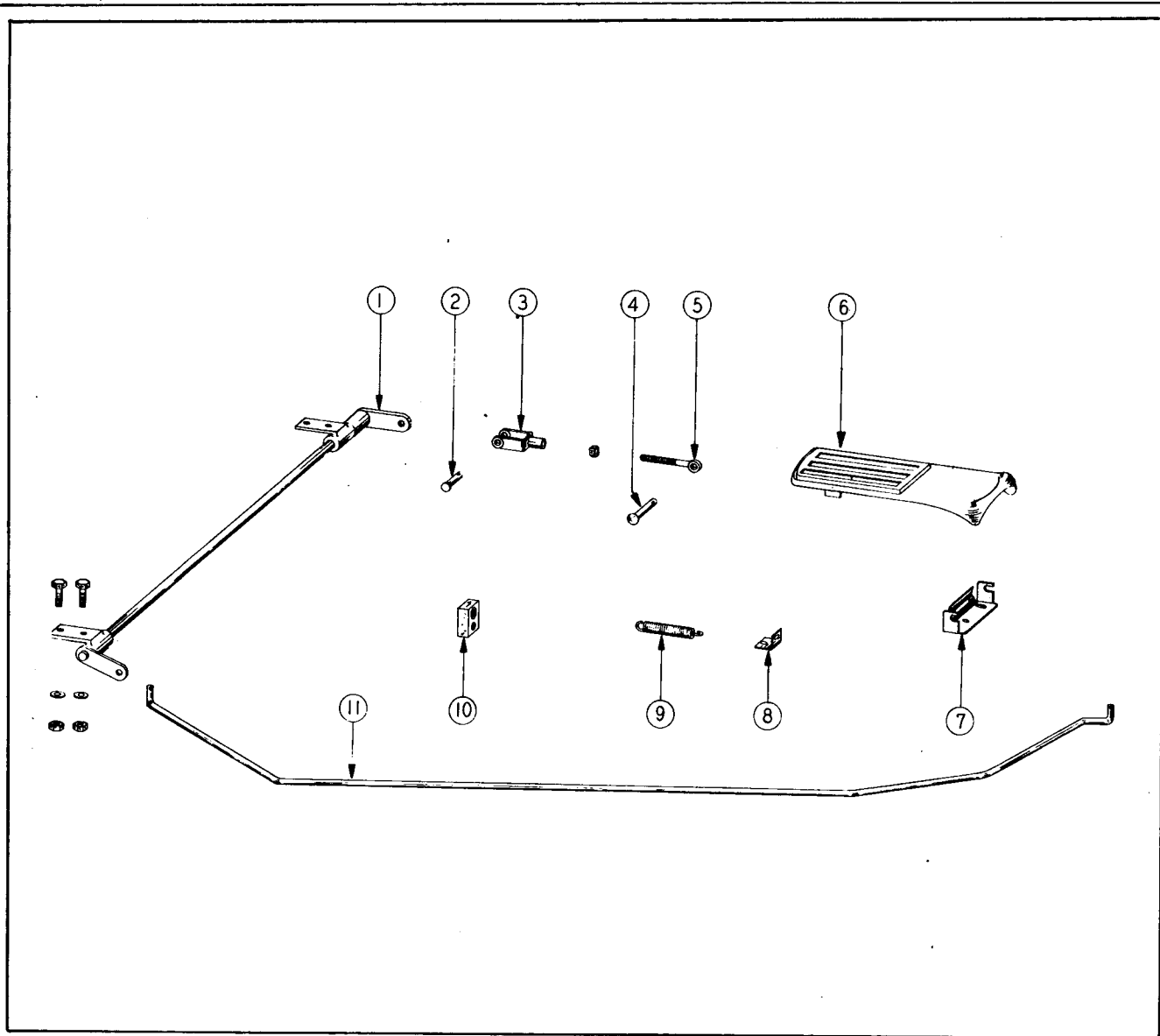


ACCELERATOR CONTROL GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
		This Group pertains to Payloaders of Serial Numbers 8003 to 8047				
1	HA-796	Cross Rod.			1	
2	HA-803	Foot Pad			1	
3	HA-800	Bearing.			1	
4	HA-799	Eyebolt - 1/4.			1	2706-2A
5	HA-807	Clevis - 1/4			1	2708-2A
6	HA-845	Pin - 1/4 Clevis			1	2708½-2A
7	HA-933	Throttle Rod			1	
8	HA-992	Support - Rod.			1	
9	HS-137	Return Spring (Not shown).			1	
10	HA-993	Spring Retainer (Not shown).			1	

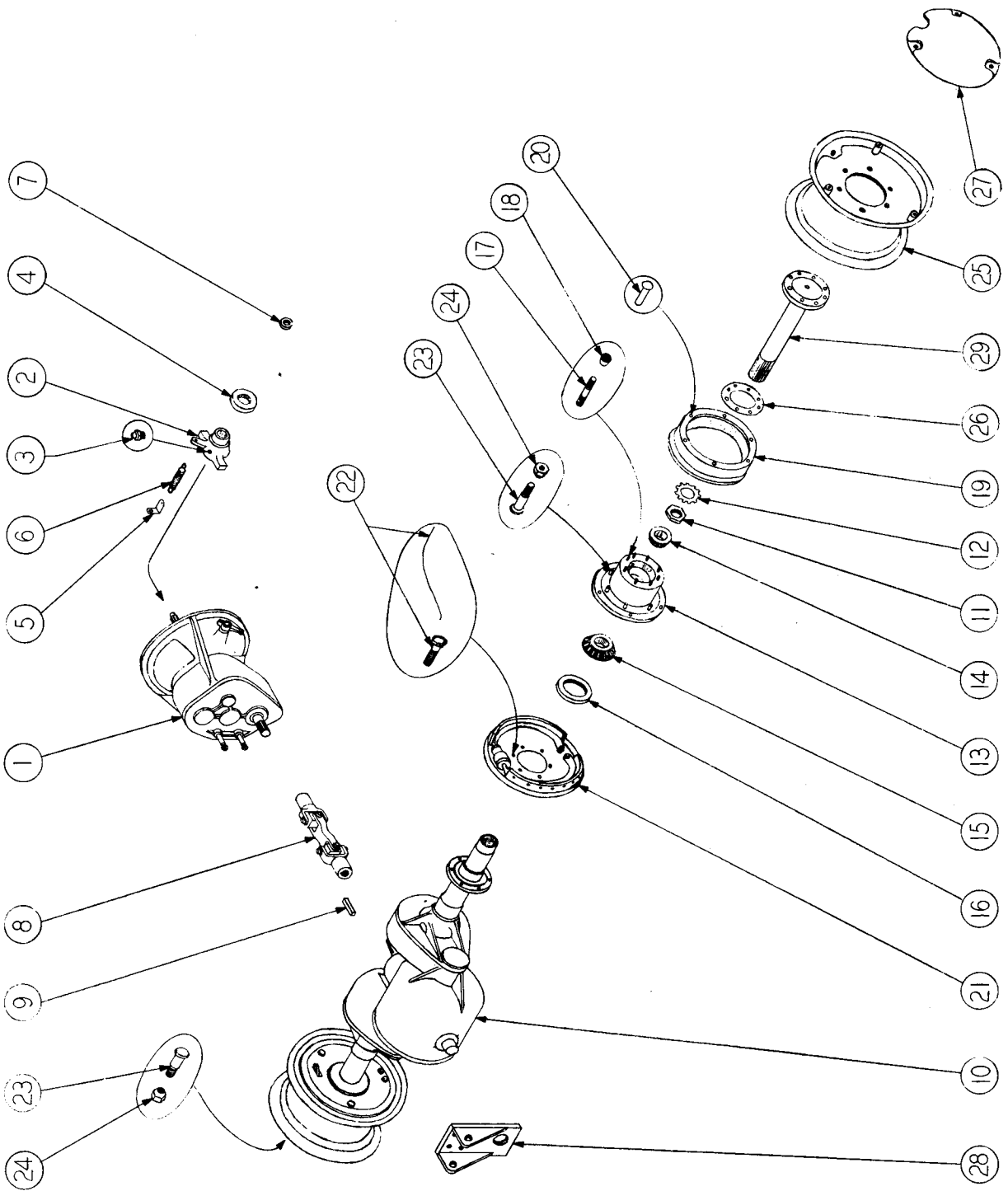
Be sure to give Serial Number of Payloader when ordering Repair Parts

Don't order from illustration only - Give Part Number & Name of Part also



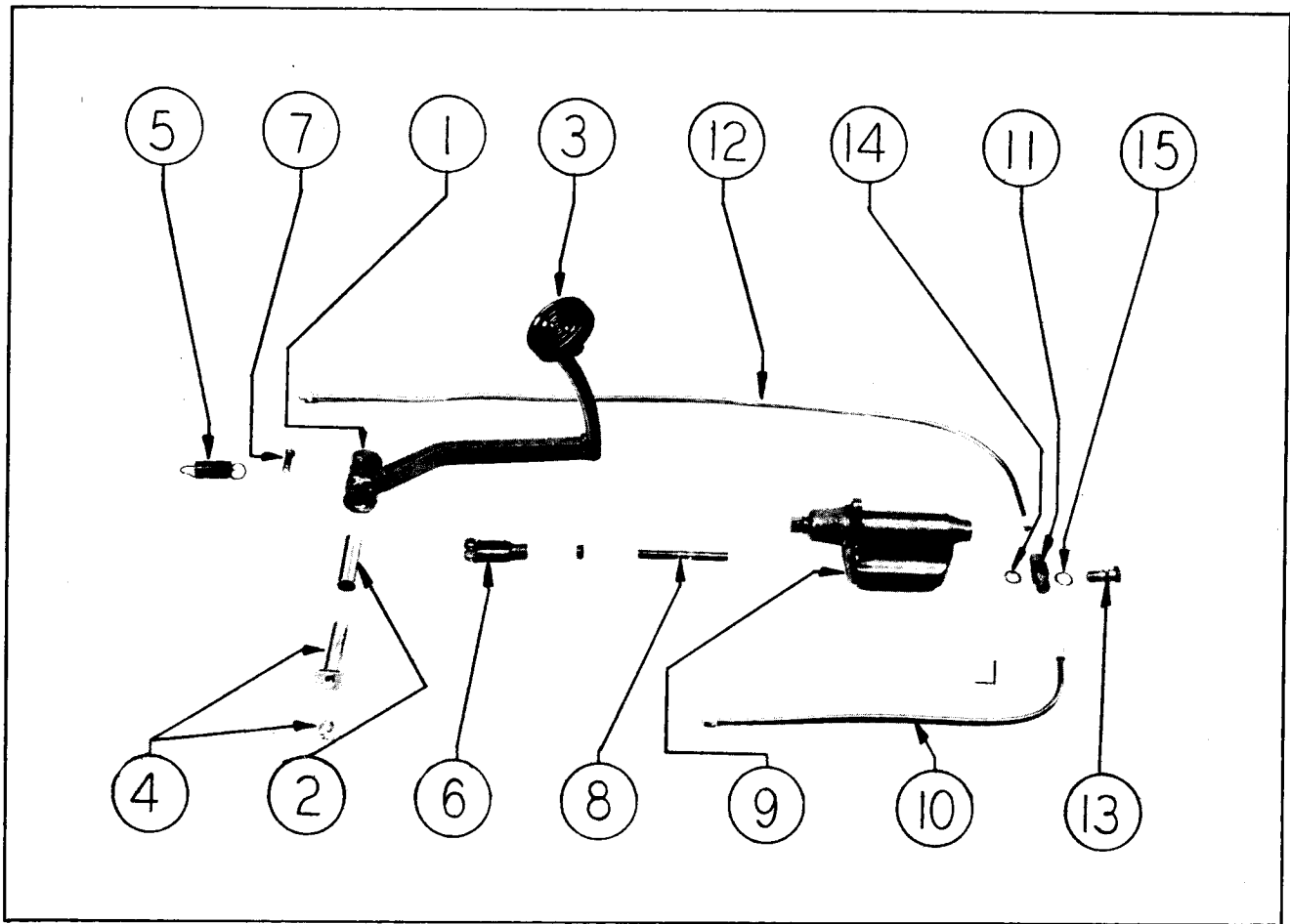
ACCELERATOR GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION	
			FROM	TO			
		This Group pertains to Payloaders of Serial Numbers 8048 and up					
1	HA-796	Cross Shaft Ass'y.			1		
2	HA-845	Pin - Clevis to Gross Shaft.			1	2708 $\frac{1}{2}$ -2A	
3	HA-807	Clevis - 1/4			1	2708-2A	
		Nut - Clevis			1		
4	HA-1388	Pin - Eyebolt to Pedal			1		
5	HA-799	Eyebolt.			1		
6	HA-1066	Foot Pedal			1		
7	HA-1067	Bracket - Foot Pedal			1		
8	HA-1141	Spring Retainer.			1		
9	HA-1064	Spring			1		
10	HA-992	Block - Throttle Rod			1		
11	HA-1103	Throttle Rod			1		



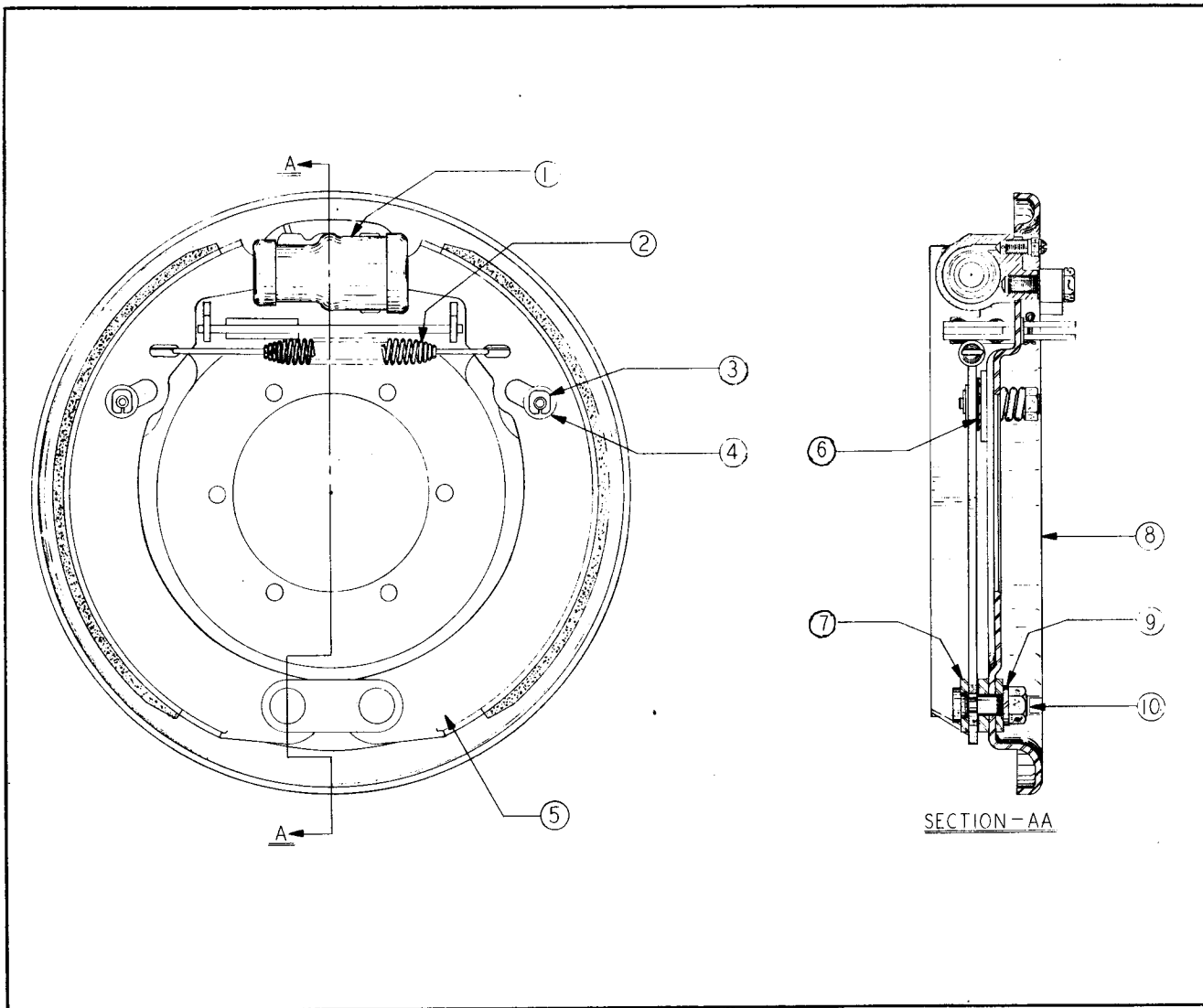
TRANSMISSION & FINAL DRIVE GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-728	Transmission (See Page 41)	8003	up	1	RT-450
2	HA-637	Throw-out Bearing Carrier			1	
3	HA-1009	Grease Fitting - 1/8 Lubriguard			1	1930
4	HA-1341	Throw-out Bearing			1	A-893-3
5	HA-932	Retainer - Spring			1	
6	HA-930	Spring - Bearing Carrier			1	
7	HA-520	Pilot Bearing - Clutch			1	8505
8	HA-537	Drive Shaft (See Page 38)			1	BW-2-9595
9	HA-953	Key - Drive Pinion			1	
10	HA-729	Final Drive (See Page 45)			1	RT-451
11	HA-584	Nut - Wheel Bearing			4	N-14
12	HA-585	Washer - Wheel Brg. Nut			2	W-14
13	HA-578	Wheel Hub (See Cups HA-861; HA-859; & HA-1488)			2	
	HA-859	Cup - Outer - Timken			2	47420
	HA-1488	Cup - Outer - Bower			2	BT-33472
	HA-861	Cup - Inner - Timken			2	34478
	HA-1512	Cup - Inner - Bower			2	BT-34478
14	HA-860	Cone - Outer - Timken			2	47487
14	HA-1487	Cone - Outer - Bower			2	BT-33275
15	HA-862	Cone - Inner - Timken			2	34300
15	HA-1511	Cone - Inner - Bower			2	BT-34300
16	HA-775	Seal - Wheel Hub			2	500316
17	HA-581	Studs - Drive Wheel			16	352728-S-18
18	HA-582	Adapter Washer			16	BB-1142-A
19	HA-495	Brake Drum			2	
20	HA-735	Rivet - Brake Drum			12	
21	HA-489	Brake Assembly - R.H. (See Page 37)			1	FF-1501-E
21	HA-490	Brake Assembly - L.H. (See Page 37)			1	FF-1500-E
22	HA-950	Capscrew - Brake to Flange			12	
		Lacing Wire - 1/16 Soft Iron x 20-1/2 lg.			2	
23	HA-731	Stud - R.H. - Wheel to Hub			6	40901
23	HA-732	Stud - L.H. - Wheel to Hub			6	40902
24	HA-733	Nut - R.H. Stud			6	41233-E
24	HA-734	Nut - L.H. Stud			6	41234-E
25	HA-635	Drive Wheel with Locking Ring			2	
	HA-1491	Locking Ring - Drive Wheel			2	120-R
26	HA-983	Gasket - Wheel to Axle Shaft			2	
27	HA-810	Hub Cap			2	
28	HA-958	Support - Final Drive			1	
29	HA-1181	Shaft - Axle (See Page 45)			2	RT-451-9



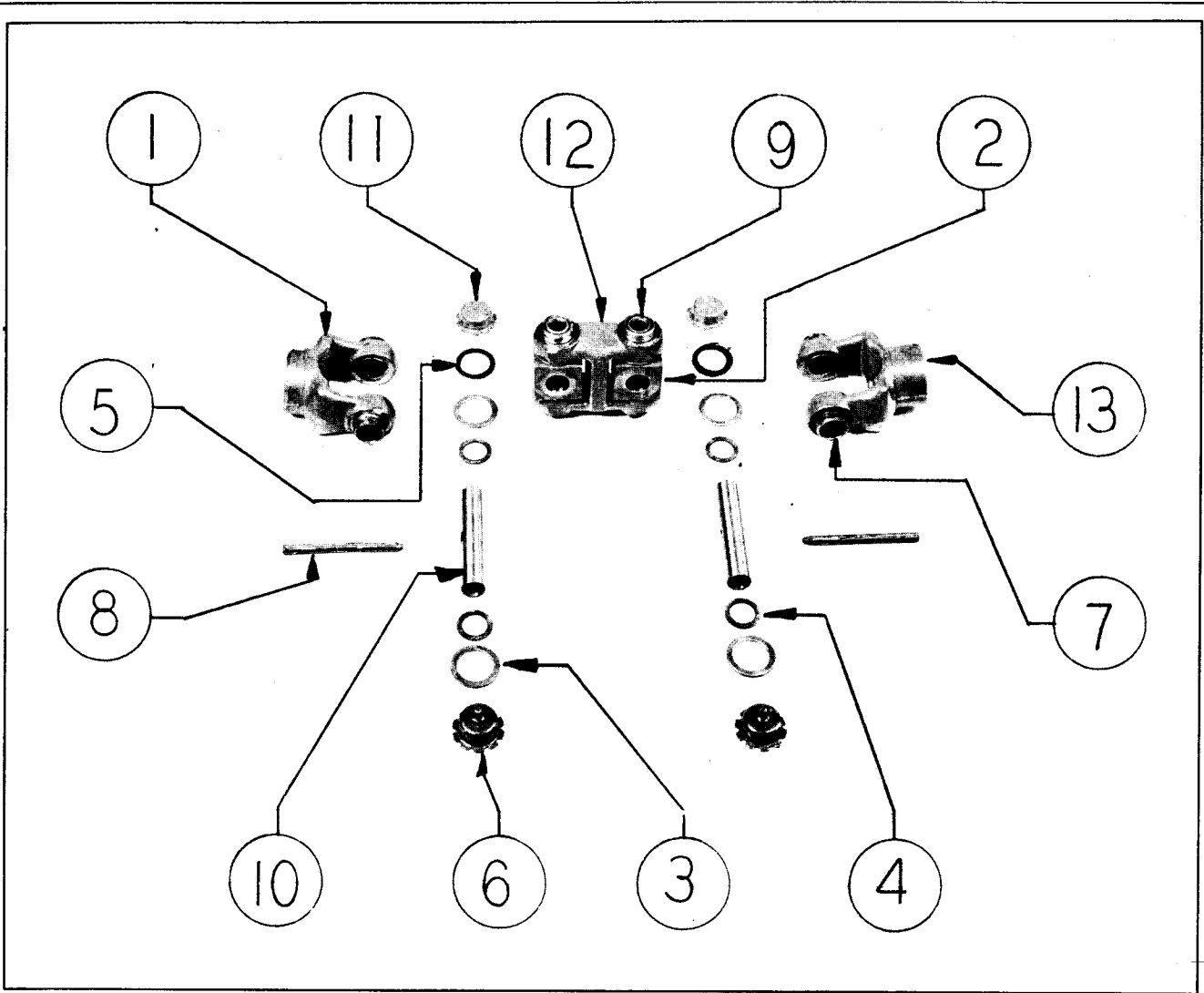
BRAKE CONTROL GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-780	Brake Pedal.	8003	up	1	
2	HA-535	Bushing.			2	BB-187
3	HA-795	Pedal Pad.			1	11A-2454
4	HA-789	Pivot Shaft.			1	
5	HA-984	Grease Fitting - 1/8 x 90° Alemite			1	
6	HA-984	Spring - Pedal Return.			1	
7	HL-3485	Clevis - 3/8			1	2708-4A
8	HL-3486	Clevis Pin - 3/8			1	2708½-4A
9	HA-848	Push Rod			1	
10	HA-484	Master Brake Cylinder (Use Wagner Repair Kit #FC5375 to Repair Cylinder Buy Kit Locally).			1	FE1050-1-1/16
11	HA-879	Tubing - R.H. Wheel (Order 2 of Item 16, also)			1	
12	HA-881	Tee - Master Cylinder.			1	FC-3473
13	HA-880	Tubing - L.H. Wheel (Order 2 of Item 16, also)			1	
14	HA-882	Stud - Master Cylinder			1	FC-673
15	HA-883	Gasket - Master Cylinder			1	FC-603
16	HA-884	Gasket - Master Cylinder			1	FC-602
16	HL-3546	Fitting - R.H. & L.H. Tubing (Not shown).	4	FC-2577		



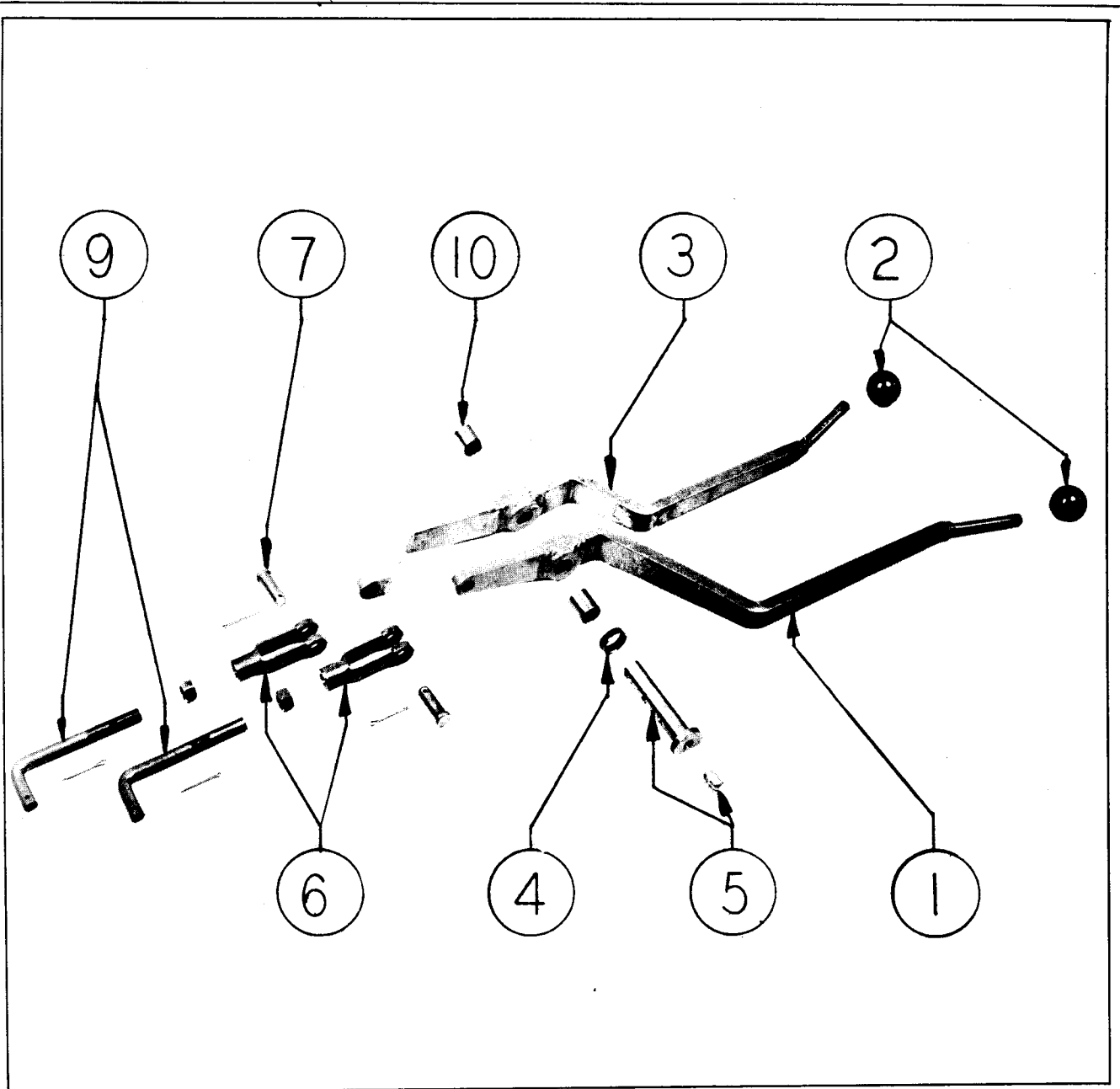
BRAKE ASSEMBLY GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
	HA-489	Brake Assemble - R.H. Complete			1	FF-1501-E
	HA-490	Brake Assemble - L.H. Complete			1	FF-1500-E
1	HA-1455	Wheel Cylinder - L.H. } Use Wagner Repair			1	FD-3002
1	HA-1456	Wheel Cylinder - R.H. } Kit FC-3625 to			1	FD-3003
						buy kit locally.
2	HA-1464	Brake Spring			1	F-4800
3	HA-1461	"C" Washer			1	FC-3912
4	HA-1463	Friction Washer.			1	FC-3911
5	HA-1457	Shoes.			2	FD-4265
6	HA-1462	Spring Disc.			1	FC-4087
7	HA-1458	Link - Shoes			1	FC-3904
8	HA-1453	Backing Plate - L.R.			1	FD-4262
8	HA-1454	Backing Plate - R.R.			1	FD-4263
9	HA-1460	Anchor Washer.			2	FC-3915
10	HA-1459	Anchor Pins.			2	FC-3913



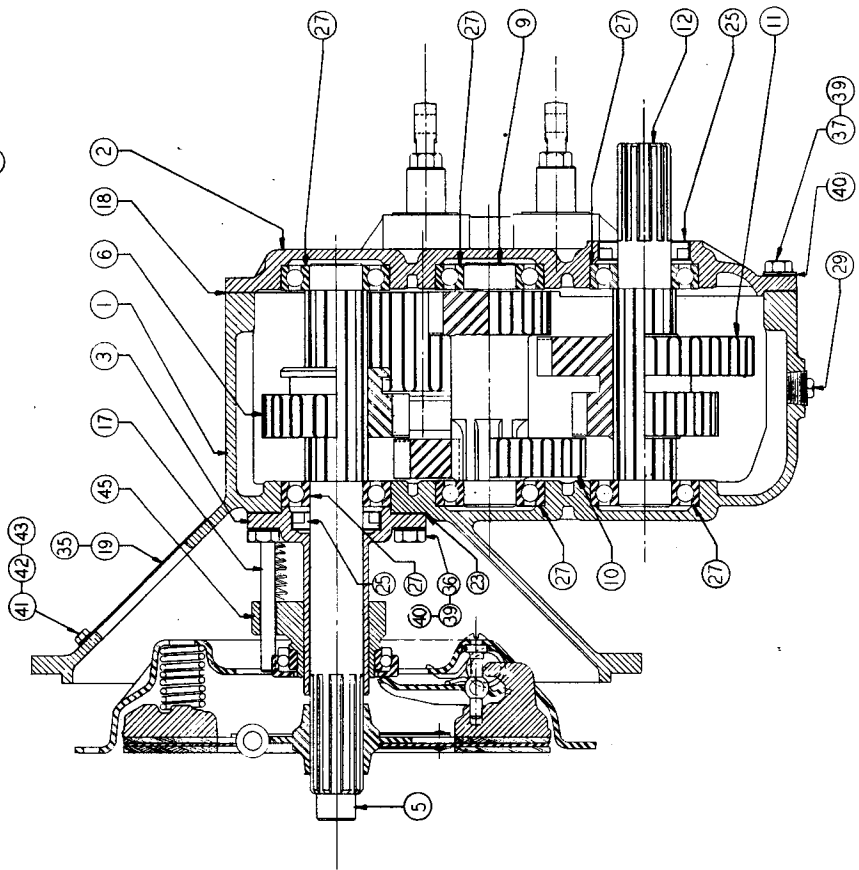
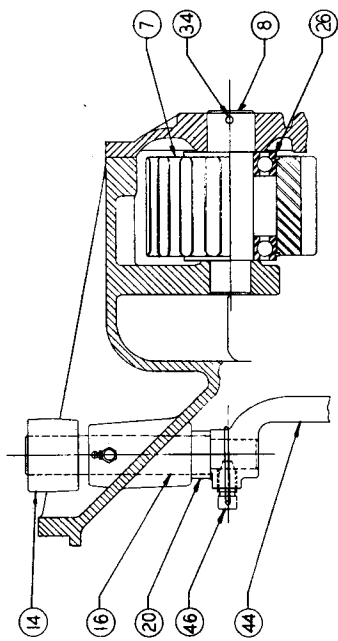
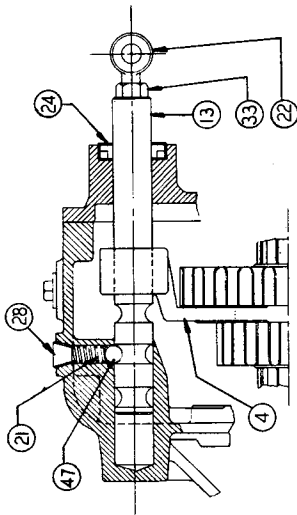
DRIVE SHAFT GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-537	Drive Shaft Complete (Includes the following)			1	BW-2#9595
1	HA-1261	Pinion Yoke (To Drive Axle)			1	230.21
2	HA-1262	Center Block			2	202.01
3	HA-1263	Bronze Washer			8	207.03
4	HA-1264	Cork Washer			8	206.11
5	HA-1265	Felt Washer			8	207.02
6	HA-1266	Bushing Cap (Lub.)			2	201.13
7	HA-1267	Bushing			8	200.15
8	HA-1268	Locking Pin			2	205.12
9	HA-1269	Shoulder Pin			2	203.11
10	HA-1270	Straight Pin			2	204.11
11	HA-1271	Bushing Cap (Plain)			6	201.12
12	HA-1272	Double Center Yoke			1	270.01
13	HA-1395	Splined Yoke (Includes next 4 items)			1	G-5986-240
	HA-1396	Metal Disc			1	212.01
	HA-1397	Dust Cap			1	109.01
	HA-1398	Felt Washer			1	110.06
	HA-1399	Metal Washer			1	111.06



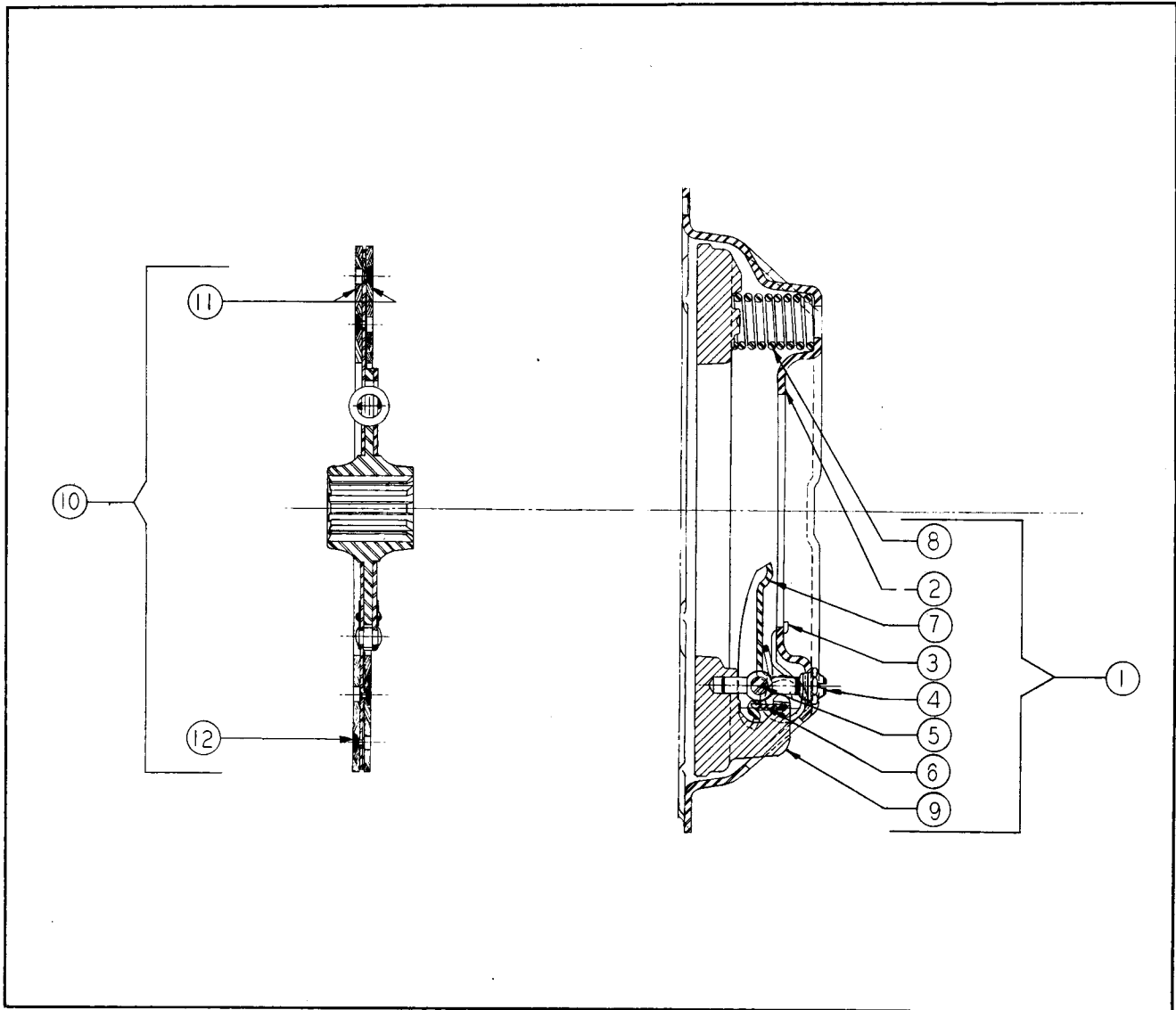
SHIFTER LEVERS GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-837	Shifter Lever - Forward & Reverse.			1	K-148
2	HL-3343	Knob			2	
3	HA-841	Shifter Lever - Range.			1	
4	HA-964	Spacer - Pivot Shaft			1	
5	HA-844	Pivot Shaft. Grease Fitting - Shaft - 1/8 x 90° Alemite			1	
6	GH-211	Clevis - 1/2 - Shifter Levers.			2	2708-6A 2708½-6A
7	GH-212	Pin - 1/2 - Clevis			2	
8	HA-955	Link			2	
9	HA-955	Link			2	
10	HA-535	Bushing - Shifter Levers			2	



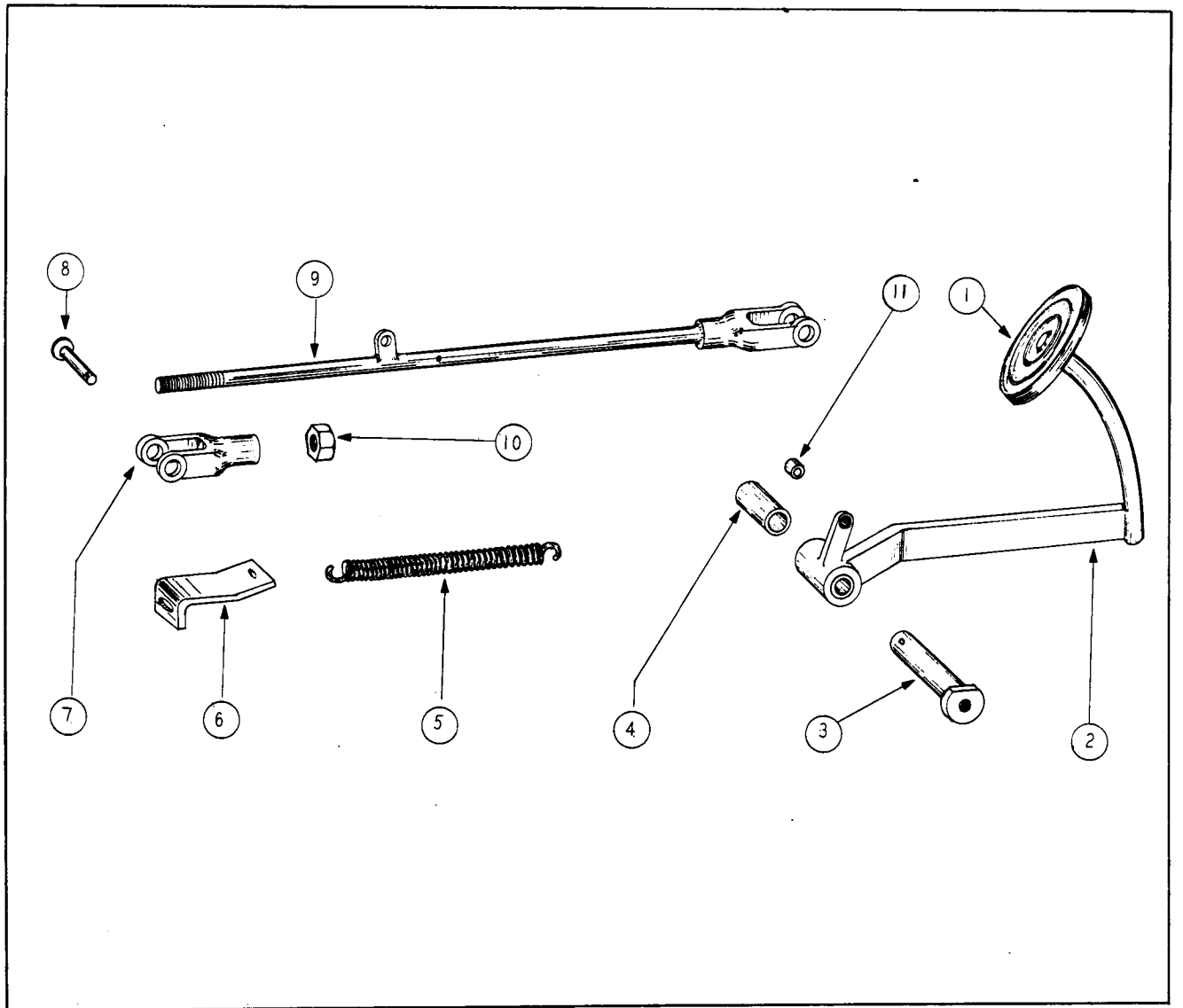
TRANSMISSION GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
	HA-728	Transmission Complete - Two Speed				
		Forward & Reverse	8003	up	1	RT-450
1	HA-1150	Bell and Transmission Housing.			1	RT-450-1
2	HA-1151	Housing Cover.			1	-2
3	HA-1152	Bearing Cover.			1	-3
4&13	HA-1324	Shifter Fork Ass'y. (Lower - Output)			1	-31
5	HA-1154	Input Shaft.			1	-5
6	HA-1155	Sliding Pinion			1	-6
7	HA-1156	Idler Gear			1	-7
8	HA-1157	Idler Shaft.			1	-8
9	HA-1158	Intermediate Shaft			1	-9
10	HA-1159	Intermediate Gear.			1	-10
11	HA-1160	Sliding Gear - (Output).			1	-11
12	HA-1161	Output Shaft			1	-12
13&4	HA-1323	Shifter Fork Ass'y. (Forward & Reverse).			1	-30
14	HA-1163	Clutch Lever			1	-14
15	HA-1164	Clutch Shifter Shaft - Plug End.			1	-15
16	HA-1165	Clutch Shifter Shaft - Lever End			1	-16
17	HA-1166	Pin - Clutch Release Carrier			1	-17
18	HA-1167	Gasket - Main Housing.			1	-18
19	HA-1168	Name Plate			1	-19
20	HA-1169	Spacer - Clutch Shaft.			2	-20
21	HA-1170	Locking Spring - Shifter			2	RT-6120
22	HA-1171	Rod End.			2	PTO-619
23	HA-1172	Gasket - Bearing			1	G-208
24	HA-1198	Oil Seal			2	50230
25	HA-1199	Oil Seal			2	50055
26	HA-1201	Ball Bearing			2	ND-41206
27	HA- 522	Ball Bearing - Plain			6	ND-1207
28		Pipe Plug - 1/4 Std.			2	
29		Pipe Plug - 1/2 Std.			2	
30	HA-1200	Breather (Not shown)			1	G-131532
31		Grease Fitting - Lincoln 1/8 Std. x 45° (Not shown)			2	5245
32	HA-1195	Dowel Pin - 3/8 Dia. x 1" Lg.			1	
33		Jam Nut - 1/2 - 20 Thd. Hex.			2	
34	HA-1196	Groove Pin - 3/16 Std.			1	
35	HA-1173	Gasket - Name Plate.			1	RT-1120
36		Capscrew - 3/8 - 16 Thd. Hex. Hd. x 7/8 Lg.			4	
37		Capscrew - 3/8 - 16 Thd. Hex. Hd. x 1-1/4 Lg.			14	
38		Capscrew - 3/8 - 16 Thd. Hex. Hd. x 1-1/2 Lg. (Not shown)			1	
39		Lockwasher - 3/8 Std.			19	
40	HA-1204	Washer - 3/8 Std. Brass.			19	
41		Capscrew - 1/4 - 20 Thd. Hex. Hd. x 1/2 Lg.			2	
42		Lockwasher - 1/4 Std.			2	
43	HA-1205	Washer - 1/4 Std. Brass.			2	
44	HA-644	Yoke - Clutch Release.			1	
45	HA-637	Clutch Release Carrier			1	
46	HA-647	Setscrew			2	
47	HA-1203	Ball - 7/16 Std.			2	



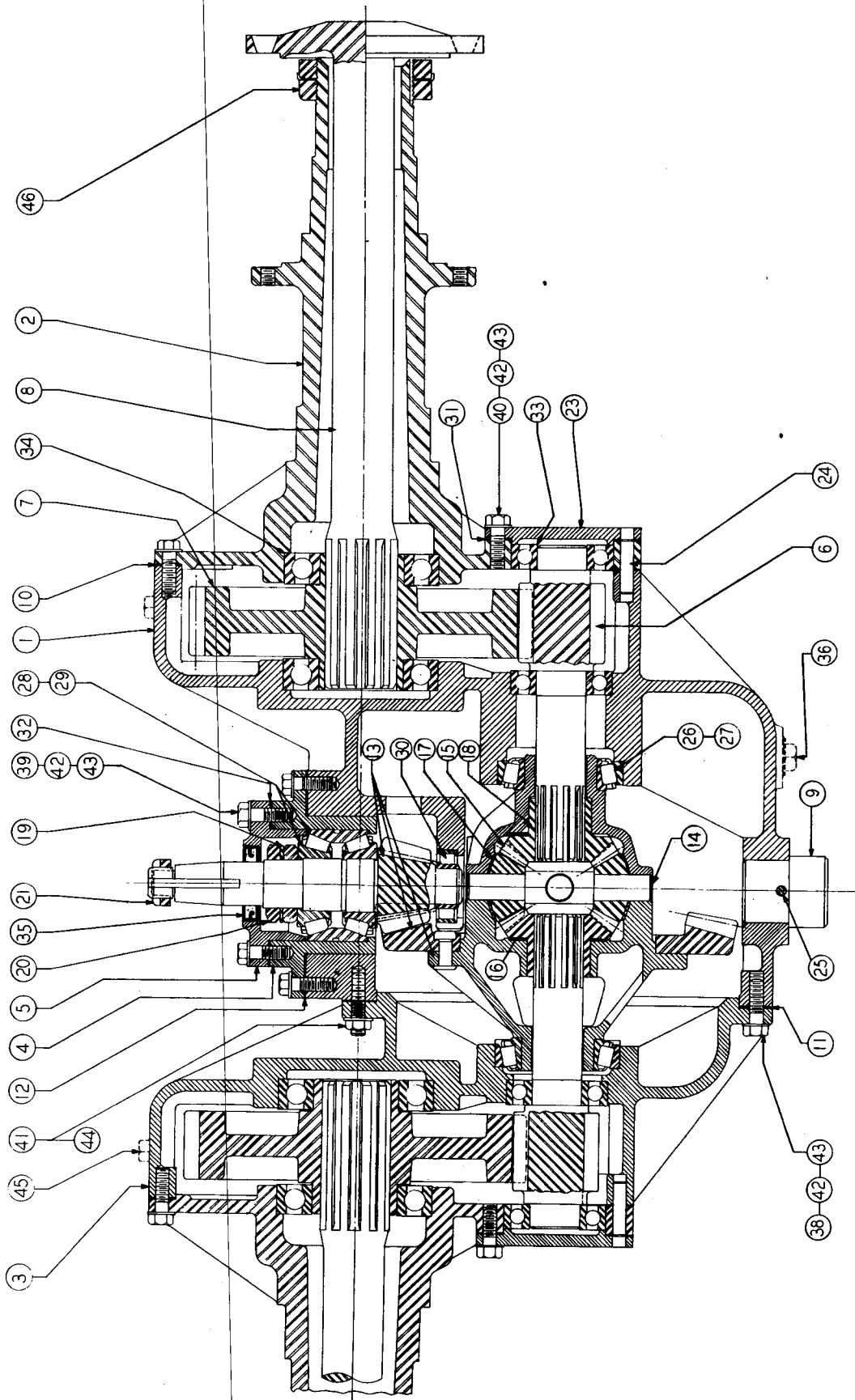
CLUTCH GROUP - HA-536 COMPLETE

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-1257	Cover Plate Assembly (Includes Items 2 to 9)	8003	up	1	879
2	HA-1281	Cover			1	4110
3	HA-1282	Anti-Rattle Spring			4	3258
4	HA-1283	Eyebolt & Nut Assembly			4	10908
5	HA-1284	Eyebolt Pin			4	3696
6	HA-1285	Release Lever Strut			4	3695
7	HA-1286	Release Lever			4	4079
8	HA-1287	Spring			12	4039
9	HA-1288	Pressure Plate			1	4085
10	HA-1258	Driven Plate Assembly (Includes Item 11 & 12)			1	
11		Facing (Woven) - Order HA-1259			2	3748
12		Rivets - Order HA-1259			24	4764
	HA-1259	Facing Package - Facing & Rivets (Not shown)			1	10644



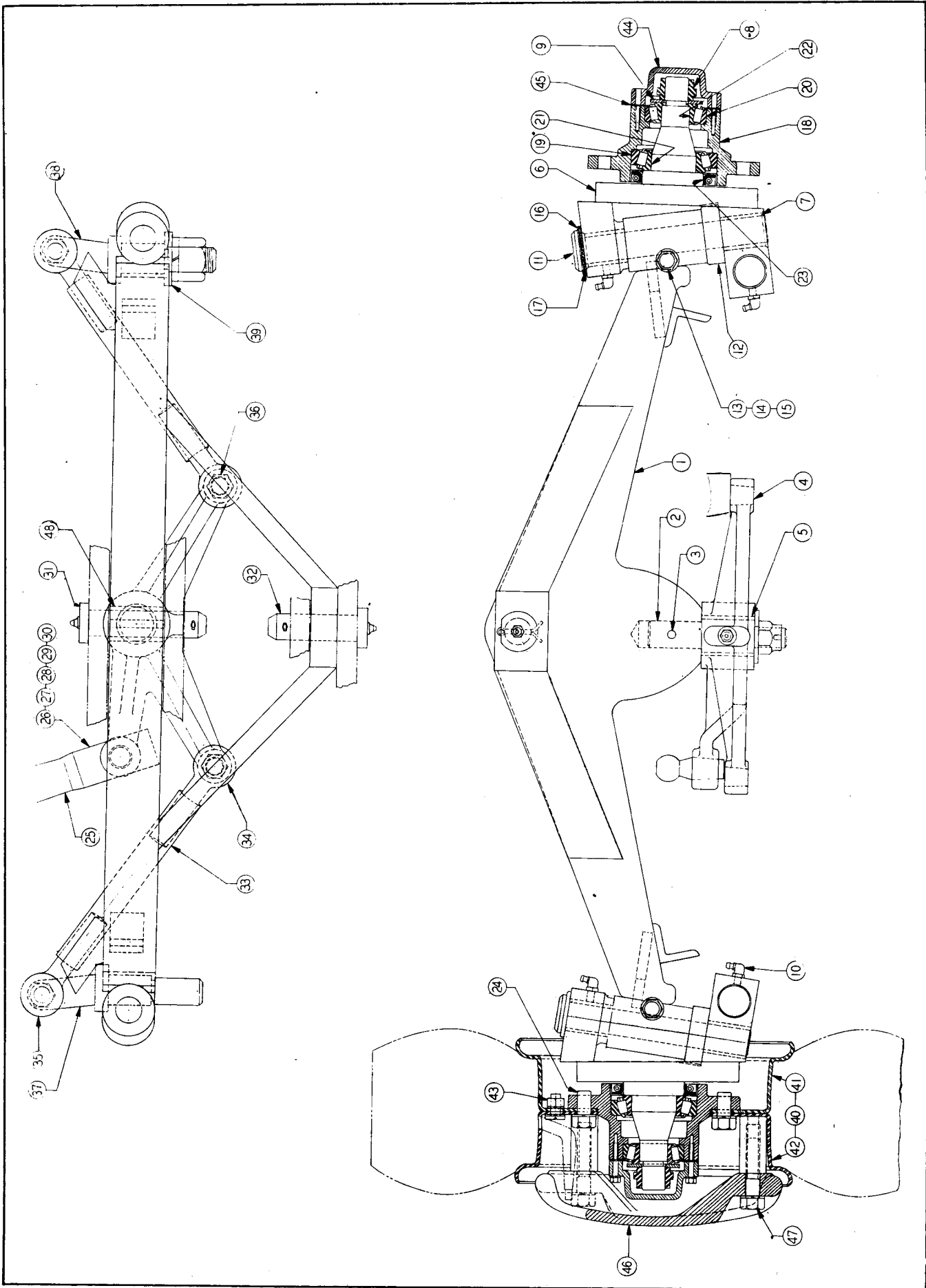
CLUTCH CONTROL GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-795	Foot Pad			1	11A-2454
2	HA-785	Clutch Pedal			1	
3	HA-792	Pivot Shaft.			1	
4	HA-779	Bushing - Clutch Pedal Hub			1	C-179
5	HS-402	Spring - Clutch Return (For HA-870)	8003	8047	1	
5	HL-3190	Spring - Clutch Return (For HA-1392)	8048	up	1	
6	HA-1387	Spring Retainer (For HS-402 & HA-870)	8003	8047	1	
6	HA-1468	Spring Retainer (For HL-3190 & HA-1392)	8048	up	1	
7	GH-211	Clevis 1/2 - Contron Rod			1	2708-6A
8	GH-212	Pin 1/2 - Clevis to Clutch Arm & Pedal Arm			2	2708 $\frac{1}{2}$ -6A
9	HA-870	Control Rod.	8003	8047	1	
9	HA-1392	Control Rod.	8048	up	1	
10		Jam Nut - Clevis - 1/2 - 20 N.F. Thd. Hex.			1	
11	WMX-150	Bushing - Control Rod to Pedal			1	



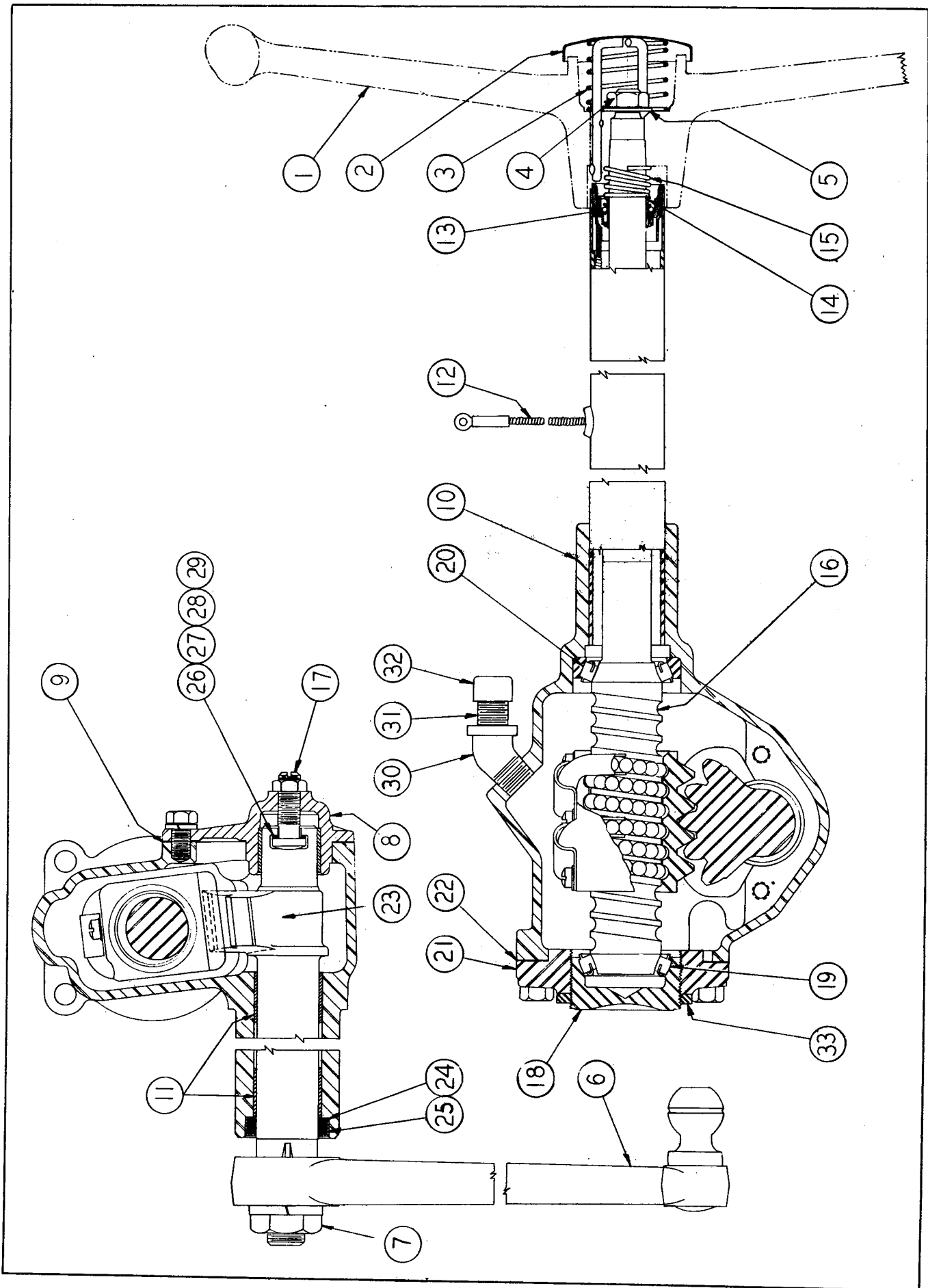
FRONT AXLE REDUCTION DRIVE

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
	HA-729	Axle and Reduction Drive Complete.	8003	up	1	RT-451
1	HA-1174	Housing - Reduction Drive.			1	RT-451-1
2	HA-1175	Cover & Axle Housing			2	-2
3	HA-1176	Housing - Extension.			1	-3
4	HA-1177	Bearing Carrier - Input Shaft.			1	-4
5	HA-1178	Cover - Input Shaft.			1	-6
6	HA-1179	Pinion - Axle Drive.			2	-7
7	HA-1180	Gear - Axle Drive.			2	-8
8	HA-1181	Shaft - Axle			2	-9
9	HA-1182	Plug - Torque Reaction			1	-10
10	HA-1183	Gasket - Housing			2	-12
11	HA-1184	Gasket - Housing Extension			1	-13
12	HA-1185	Gasket - Bearing Carrier Input Shaft			1	-14
13	HA-1186	Gear & Pinion with Differential Case			1	-17
14	HA-1187	Spider - Differential.			1	-18
15	HA-1188	Pinion - Differential.			4	-19
16	HA-1189	Thrust Washer.			2	-20
17	HA-1190	Washer - Pinion.			4	-21
18	HA-1191	Gear - Differential.			2	-22
19	HA-1192	Locking Washer			1	-23
20	HA-1193	Pinion - Nut			2	-24
21	HA-1081	Nut - Input Pinion Shaft			1	-25
22	HA-1200	Breather			1	131532
23	HA-1194	Cover.			2	BC-207
24	HA-1206	Dowel Pin.			2	
25	HA-1207	Groove Pin			1	
26	HA-1208	Bearing Cone			2	368
27	X-247	Bearing Cup.			2	362-A
28	HA-1209	Bearing Double Cup			1	27820
29	HA-1210	Bearing & Cone			2	27880
30	HA-1211	Bearing - Straight			1	S-1205
31	HA-1197	Gasket			2	G-207
32	HA-1172	Gasket			1	G-208
33	HA-522	Ball Bearing			4	ND-1207
34	HA-1202	Ball Bearing			4	ND-1212
35	HA-1213	Oil Seal			1	21218
36		Pipe Plug - 3/4 Std.			1	
37		Capscrew - 3/8 - 16 Thd. N.C. - Hex. Hd. x 1" Lg.			4	
38		Capscrew - 3/8 - 16 N.C. Thd. Hex. Hd. x 1-1/2" Lg.			10	
39		Capscrew - 3/8 - 16 N.C. Thd. Hex. Hd. x 1-1/4" Lg.			30	
40		Capscrew - 3/8 - 16 N.C. Thd. Hex. Hd. x 1" Lg.			8	
41	HA-1212	Stud Bolt.			2	
42		Lockwasher - 3/8 Std.			54	
43	HA-1204	Washer - 3/8 Brass Std.			54	
44		Nut - 3/8 - 16 N.C. Thd. Hex.			2	
45		Pipe Plug - 1/2 Std.			5	
46	HA-584	Locking Nut.			4	



STEERING & REAR AXLE GROUP

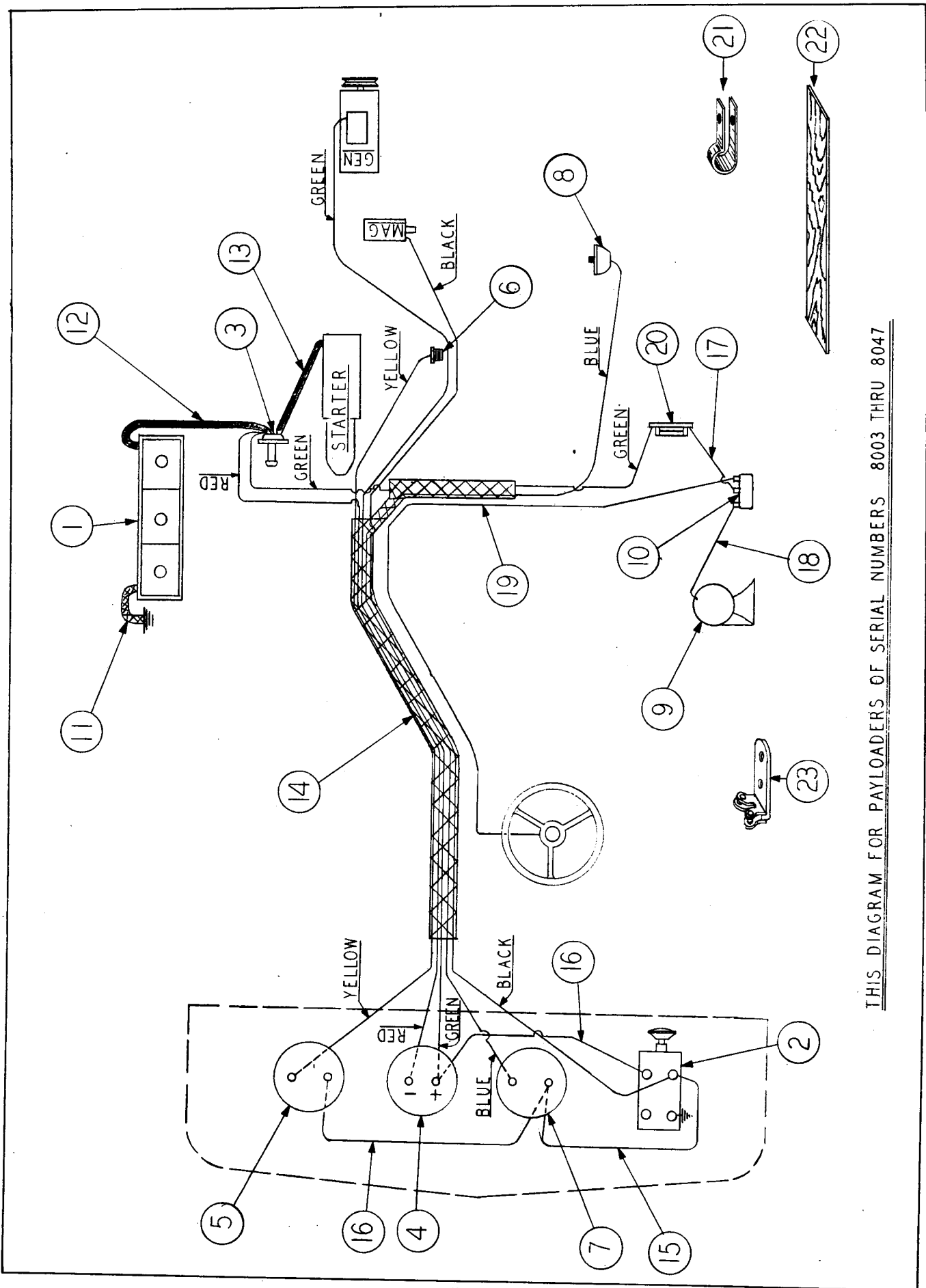
ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-615	Rear Axle.			1	
2	HA-602	Pivot Pin - Bell Crank (Order Item 3 also)			1	
3	HA-409	Pin - Pivot Pin Retainer			1	
4	HA-634	Bell Crank - Steering.			1	
5	HA-619	Bushing - Bell Crank			1	E-840
6	102438	Spindle }	20124	up	2	
6	HA-202	Spindle } Interchangeable			8003	20123
7	HA-929	Bushing - Spindle.			4	81T3109
8	HA-1470	Nut - Spindle.			2	351152-S
9	HA-397	Retainer Washer - Spindle.			2	BB-1195
10		Grease Fitting - Spindle (1/4 - 28 N.F. Thd. x 90)			4	1911
11	HA-871	King Pin			2	81T3115
12	HA-872	Bearing - King Pin			2	81T3123A
13	HA-614	Keeper - King Pin.			2	81T3122
14	HA-874	Lockwasher - Keeper.			2	34808-S-2
15	HA-873	Nut - Keeper			2	33802-S-2
16	HA-876	Retainer - Felt Washer			2	81T3288
17	HA-875	Felt Washer - Spindle.			2	81T3125
18	HA-201	Hub - Wheel.			2	
19	X-230	Cup - (Inner) - Hub.			2	22325
20	X-394	Cup - (Outer) - Hub.			2	1932
21	X-229	Cone - (Inner) - Hub			2	22168
22	HA-494	Cone - (Outer) - Hub			2	1987
23	HA-396	Grease Seal - Hub.			2	
24		Capscrew - Hub to Wheel - 1/2 - 13 N.C. Hex. x 1" Lg.			10	
25	HA-405	Drag Link.			1	
26	HS-830	Spring - Drag Link Ball Joint.			2	72P07
27	HS-831	Seat - Drag Link Ball Joint.			4	72P03
28	HS-832	Threaded Plug - Drag Link Ball Joint			2	72P05
29	HS-836	Bearing - Drag Link Ball Joint			2	72P03R
30	HS-1042	Spacer - Drag Link Ball Joint.			2	72P010
31	102034	Pin - Bolster.			1	
32	102035	Pin - Radius Rod			1	
		Cotter - Pins (3/16 x 2 Lg.)			2	
33	HA-197	Tie Rod.			2	
34	HA-384	Tie Rod End - R.H. Thd.			2	01T-3289
35	HA-383	Tie Rod End - L.H. Thd.			2	01T-3290
36	HA-1325	Nut - Tie Rod End (9/16 - 18 Thd. S.A.E. Light Castle			4	34020-S-2
37	HA-411	Steering Arm - L.H.			1	
38	HA-410	Steering Arm - R.H.			1	
		Nut - Steering Arm			2	
39	HA-378	Washer - Steering Arm.			2	
40	HA-1321	Wheel - Complete (Includes Items 41 & 42, 43)			2	
41	HA-402	Rim - Inner.			2	D182
42	HA-814	Rim - Outer (With Valve Hole)			2	
43		Capscrew (Rim Ass'y) 3/8 - 24 Thd. Fill. Hd. x 3/4 Lg. with Nut & Two (2) Lockwashers			16	
44	HA-812	Grease Cap (Hub)			2	
		Capscrew (Grease Cap) - #10-24 Rd. Hd. Mach. Screw x 1-1/4 Lg.			4	
		Lockwasher (Grease Cap) - 3/16 Std.			4	
45	HA-834	Gasket - (Grease Cap)			2	
46	HA-811	Hub Cap.			2	
47		Capscrew - Hub Cap - 1/2 - 20 Thd. Hex. Hd. x 2 Lg. with 1/2 Std. Lockwasher.			6	
48	HA-943	Bushing - Axle Pivot			1	
	102542	Collar - For 102438 spindle (Not shown).			2	



STEERING GEAR ASS'Y - HA-138 - COMPLETE

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
	HA-1469	Steering Gear Assembly with grease LESS Pitman Arm, Steering Wheel, Horn Button Ass'y. & Horn Button Screws. . .			1	269233
1	HA-1231	Steering Wheel	8003	20020	1	270173
1	HA-1493	Steering Wheel	20021		1	754306
2	HA-1256	Cap - Horn Button (To Fit HA-1231 Strg. Wheel).	8003	20020	1	268733
2	HA-1494	Cap - Horn Button (To Fit HA-1493 Strg. Wheel).	20021		1	755904
3	HA-1451	Spring - Horn Button (To Fit HA-1231 Strg. Wheel).	8003	20020	1	268742
3	HA-1497	Spring - Horn Button (To Fit HA-1493 Strg. Wheel).	20021		1	755284
	HA-1495	Retainer (Not shown) (To Fit HA-1493 Strg. Wheel).	20021		1	754410
	HA-1496	Rubber Ring (Not shown) (To Fit HA-1493 Strg. Wheel).	20021		1	754104
4	HA-1232	Nut - Steering Wheel			1	114496
5	HA-1492	Washer - Strg. Wheel Nut			1	265079
6	HA-1254	Pitman Arm Ass'y.			1	269033
7	HS-924	Nut - Pitman Arm			1	254291
8	HS-902	Cover Ass'y. Housing Side.			1	267387
9	HS-919	Gasket - Side Cover.			1	266674
10	HA-1238	Housing Ass'y. (Includes next 3 items) .			1	269273
11	HA-1251	Bushing - Pitman Shaft			2	266316
12	HA-1447	Cable - Horn			1	266925
13	HA-1236	Bearing Ass'y. - Upper			1	264887
14	HA-1234	Seat - Upper Bearing Spring.			1	264831
15	HA-1233	Spring - Upper Bearing			1	264832
16	HA-1235	Steering Shaft & Ball Nut Ass'y.			1	269236
17	HS-914	Adjuster - Lash.			1	266678
18	HA-1247	Adjuster - Worm Thrust			1	267689
19	HA-1240	Bearing - Worm Thrust.			2	179291
20	HA-1239	Cup - Worm Thrust,			1	179290
21	HA-1246	Cover - Housing End.			1	267690
22	HA-1245	Gasket - End Cover			1	266052
23	HA-1250	Gear - Pitman Shaft.			1	268236
24	HA-1252	Packing - Pitman Shaft			1	262155
25	HA-1253	Retainer - Packing				262156
26	HA-1440	Shim - Lash Adjuster				266903
27	HA-1441	Shim - Lash Adjuster				266905
28	HA-1445	Shim - Lash Adjuster				266907
29	HA-1446	Shim - Lash Adjuster				266909
30		Elbow - Filler Pipe - 3/8 Std. x 45° Street Ell.				
31		Nipple - Filler Pipe - 3/8 Std. Close Nipple.				
32		Cap - Filler Pipe - 3/8 Std. Pipe Cap. .			1	266677
33	HA-1248	Nut - Worn Adjuster Screw.				

Be sure to give Serial Number of Payloader when ordering Repair Parts



THIS DIAGRAM FOR PAYLOADERS OF SERIAL NUMBERS 8003 THRU 8047

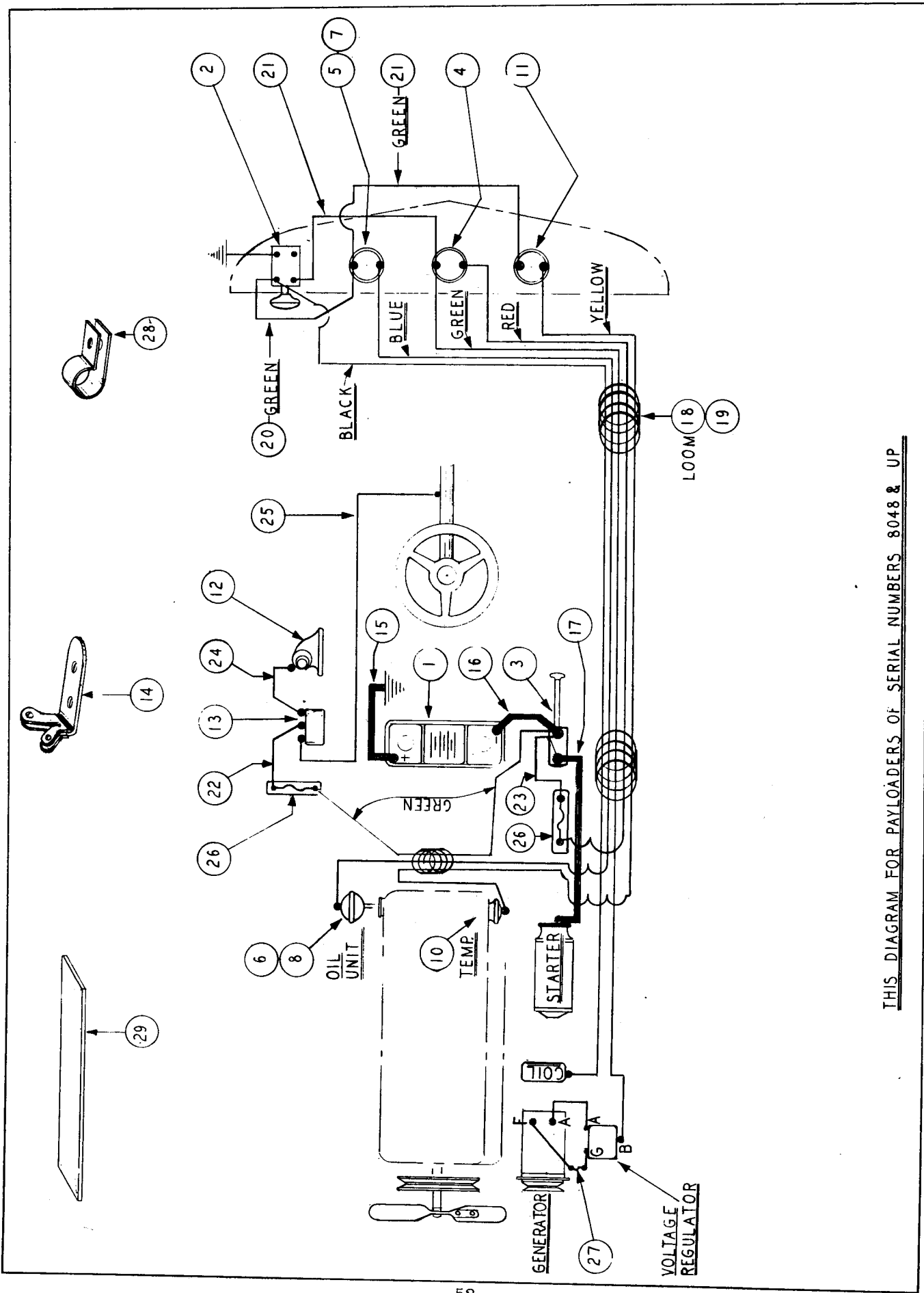
WIRING AND CONNECTION GROUP

THIS GROUP PERTAINS TO PAYLOADERS OF SERIAL NUMBERS 8003 THRU 8047

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HS-232	Battery - Exide Sure Start 15-E (Buy locally)			1	15-E
2	HA-651	Ignition Switch.			1	16696
3	HL-3437	Starter Switch			1	SW-4001
4	HA-339	Ammeter - 6 volt			1	95522
5	HA-345	Temperature Gage - Dash - 6 volt			1	442089
6	HA-344	Temperature Gage - Engine Unit - 6 volt.			1	438015
7	HA-347	Oil Gage - Dash - 6 volt			1	444080
8	HA-346	Oil Gage - Engine Unit - 6 volt.			1	438011
9	HS-407	Horn - 6 volt.			1	1999519
10	HS-451	Horn Relay - 6 volt.			1	1116775
11	HS-233	Ground Strap - 7-1/2 Lg.			1	5-U-7
12	HL-3424	Cable - Battery to Starter Switch.			1	
13	HA-342	Cable - Starter Switch To Starter Motor.			1	
14	HA-1316	Loom - Wiring.			1	
15	HA-362	Wire - Ignition Switch to Oil Gage			1	
16	HA-1000	Wire - Oil Gage to Temperature Gage.			1	
16	HA-1000	Wire - Ammeter to Ignition Switch.			1	
17	HA-1001	Wire - Fuse Block to Horn Relay.			1	
18	HA-1002	Wire - Horn Relay to Horn.			1	
19	HA-1003	Wire - Horn Relay to Steering Column			1	
20	HL-3600	Fuse Block			1	1005-1
21	HA-1351	Clamp - Wiring			3	
22	HA-1018	Insulator - Battery Box.			1	
23	HS-617	Bracket - Horn Mtg.			1	1872391
	101986	Fuse - Fuse Block 3AG MTG. - 20 Amp. (Not shown)				

Be sure to give Serial Numbers when ordering Repair Parts

Be sure to give Part Number and Name of Part being ordered



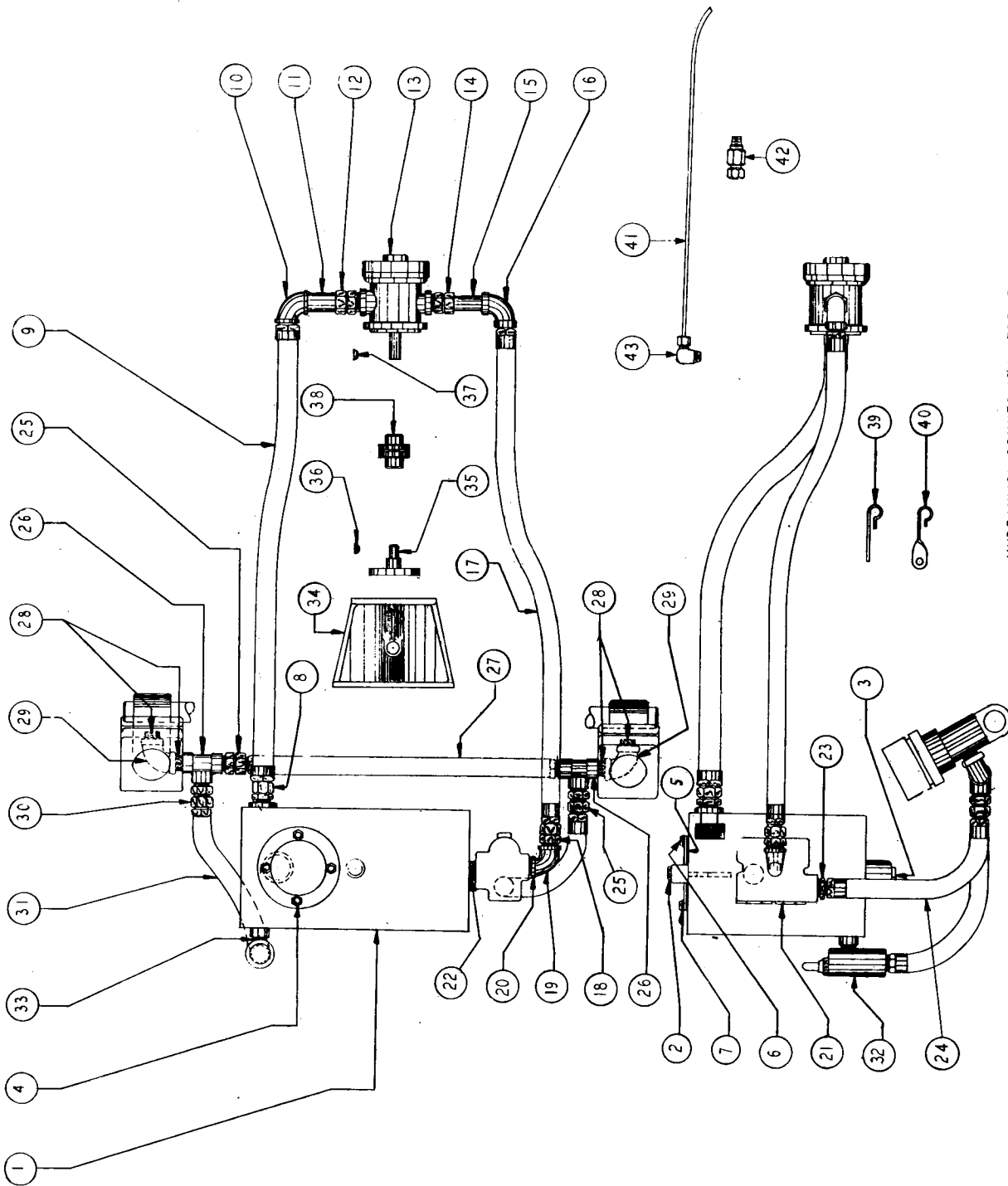
THIS DIAGRAM FOR PAYLOADERS OF SERIAL NUMBERS 8048 & UP

WIRING AND CONNECTION GROUP

THIS GROUP PERTAINS TO PAYLOADERS OF SERIAL NUMBERS 8048 & UP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HS-232	Battery - Exide Sure Start 15-E (Not replaced by the Frank G. Hough Co.) . .			1	15-E
2	HA-651	Ignition Switch.			1	16696
3	HL-3437	Starter Switch			1	SW-4001
4	HL-3151	Ammeter.			1	1500446
5	HL-3153	Oil Gage - Dash (cannot be used with Item 8)	8048	8227	1	1506766
6	HL-3685	Oil Gage - Engine (cannot be used with Item 7)	8048	8227	1	1506597
7	HA-1343	Oil Gage - Dash (cannot be used with Item 6)	8228	up	1	1506841
8	HA-1344	Oil Gage - Engine (cannot be used with Item 5)	8228	up	1	1506654
		Street Ell - Oil Gage Engine Unit - 1/8 x 90			1	
		Nipple - Oil Gage Engine Unit - 1/8 Close			1	
		Tee - Oil Gage Engine Unit - 1/8 Std. . .			1	
		Nipple - Oil Gage Engine Unit - 1/8 Short	8003	20250	1	
		Coupling - Oil Gage Engine Unit - 1/8 Std.	8003	20250	1	
10	HL-3687	Temperature Gage - Engine Unit - 6 volt.			1	1511525
11	HL-3154	Temperature Gage - Dash - 6 volt			1	1511643
12	HS-407	Horn - 6 volt.			1	1999519
13	HS-451	Horn Relay - 6 volt.			1	1116775
14	HS-617	Horn Bracket			1	1872391
15	HS-233	Ground Strap - 7-1/2 Lg.			1	5-U-7
16	HA-1403	Cable - Battery to Starter Switch. . . .			1	
17	HA-342	Cable - Starter Switch to Starter. . . .			1	
18	HA-995	Loom Wiring (wires not sold separately).	8048	8061	1	
19	HA-1364	Loom Wiring (wires not sold separately).	8062	up	1	
20	HA-362	Wire - Ignition Switch to Oil Gage . . .			1	
21	HA-1000	Wire - Oil Gage to Temperature Gage. . .			1	
21	HA-1000	Wire - Ignition Switch to Ammeter. . . .			1	
22	HA-1001	Wire - Horn Relay to Fuse Block.			1	
23	HA-1359	Wire - Fuse Block to Starter Switch. . . .			1	
24	HA-1002	Wire - Horn Relay to Horn.			1	
25	HA-1003	Wire - Horn Relay to Steering Column. . .			1	
26	HL-3600	Fuse Block (One Req'd for Serial No's 8049 to 8061.)			2	1005
	101986	Fuse - Fuse Block - 3AG-20 Amp. (Not shown).			2	
27	102016	Wire - Voltage Regulator to Generator. . .			1	
	102017	Fuse - 3AG-6 Amp. - Included in Item 27 (Not shown)			1	
28	HA-1351	Wiring Clamp			3	
29	HA-1018	Insulator - Battery Box.			1	

Be sure to give Serial Number of Payloader when ordering Repair Parts

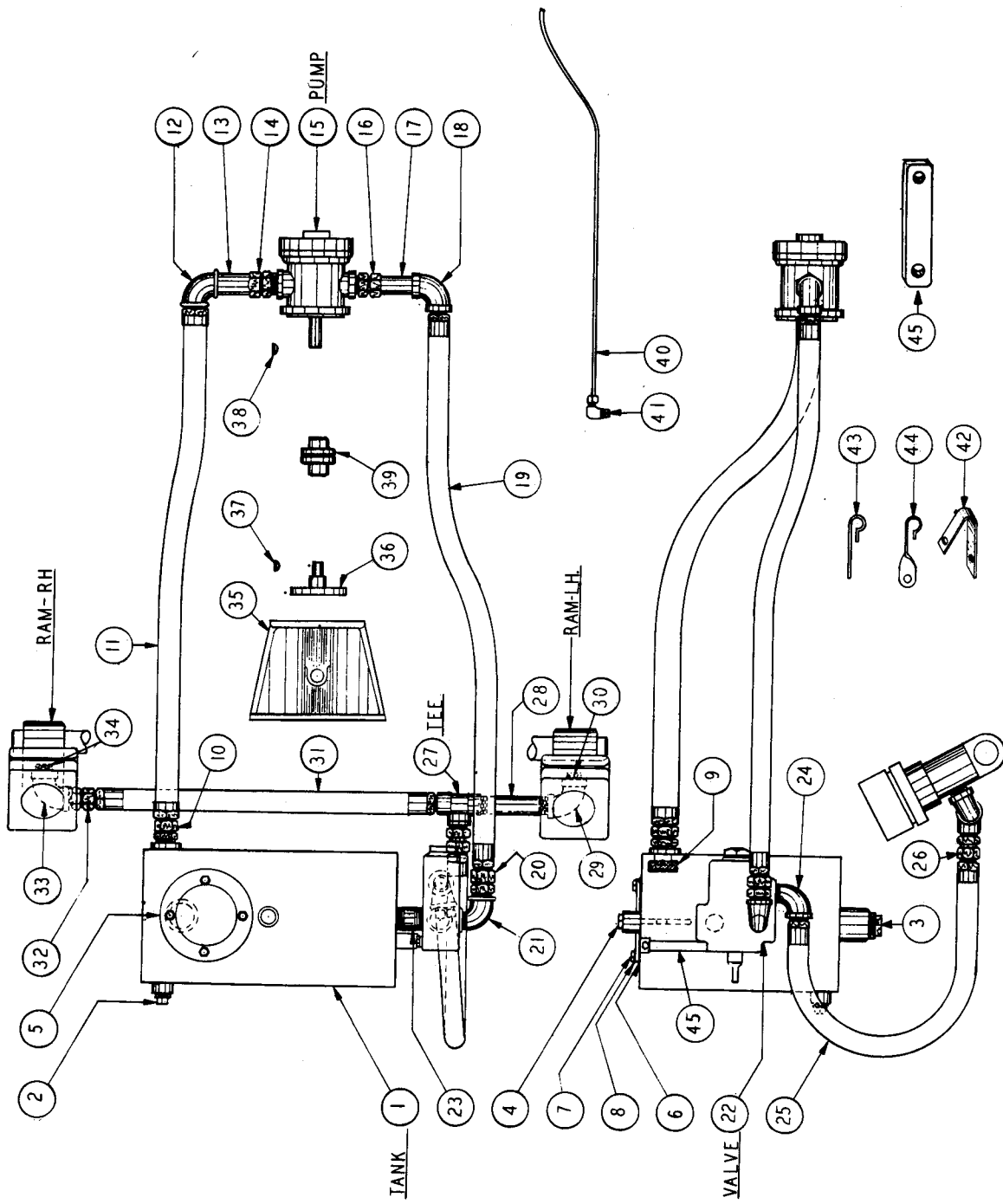


HYDRAULIC CONNECTIONS FOR PAYLOADERS OF
 SERIAL NUMBER 8003 THRU 8047

PUMP AND HOSE GROUP

THIS GROUP PERTAINS TO MACHINES OF SERIAL NUMBERS 8003 TO 8047 ONLY

ITEM NO.	PART NO.	PART NAME	QTY. REQ'D.	DESCRIPTION
1	HA-750	Oil Tank	1	
2		Plug - Filler - (Order HA-1294 Bayonet Gauge).	1	
3	HA-1069	Plug - Drain - 1½ Sq. Hd. Heavy Duty	1	#406RF
4	HA-759	Clean out Cover.	1	
5	HA-902	Gasket - Clean out Cover	1	
6		Bolt - Clean out Cover - 3/8 - 16 N.C. Hex. x 1" lg.	4	
7	EW-198	Washer	4	
		Line - Oil Tank to Pump		
8	GH-8116A1	Swivel Union - 1"	1	
9	HA-990	Hose - 1" Suction.	1	
10		Elbow - 1" Std. x 90° Banded Ell	1	
11	HA-907	Nipple - 1" x Heavy x 2-9/16 lg.	1	
12	GH-8116A1	Swivel Union	1	
13	HA-771	Pump (See page 56)	1	V-2105-C-LH
		Line - Pump to Control Valve		
14	HA-790	Swivel Union - 3/4	1	
15	HA-908	Nipple	1	
16	HA-1072	Elbow - #1500 WOG 3/4	1	#260H
17	HA-991	Hose - 3/4 Hi Pressure	1	
18	HA-790	Swivel Union - 3/4	1	
19		Street Ell - 3/4 Std. x 90°	1	
20		Bushing - 3/4 to 1¼ Face Bushing	1	#327D
21	GH-565	Control Valve (See page 58).		
22		Nipple - Valve to Oil Tank - 1" X Heavy Close.		
		Line - Control Valve to Rams		
23		Bushing - 1" to 3/4 Hex. MI.	1	
24	HA-988	Hose - 3/4 Hi Pressure	1	
25	HA-790	Swivel Union - 3/4	2	
26	HA-1070	Tee - Between Rams "2000 WOG - 3/4"	2	2124D
27	HA-989	Hose Between Rams.	1	
28		Nipple - Tee to Rams - 3/4 Extra Heavy Close	4	
29	HA-1071	Elbow - To Rams #2000 WOG.	2	2120D
		Return Line - LH Tee to Oil Tank		
30	HA-790	Swivel Union	1	
31	HA-988	Hose - 3/4 Hi Pressure	1	
32	HA-954	Relief Valve	1	H-452-C
33		Nipple - To Tank 3/4 X Heavy Close	1	
34	HA-762	Pump Support	1	
35	HA-763	Pump Drive Shaft	1	
36		Key - #11 Woodruff	1	
37		Key - #9 Woodruff	1	
38	HA-761	Flexible Coupling - Includes next 3 items.	1	
	HA-1409	Chain - Coupling	1	X5466-12P
	HA-1410	Links - Coupling	1	C6444
	HA-1408	Sprocket - Coupling.	2	
39	HA-1021	Hose Support - Hi Pressure Hose.	1	
40	HA-1022	Hose Support - Ram	1	
41	HA-760	Breather Tubing (Order with items 42 & 43)	1	
42	HS-972	Fitting - Tubing	1	#68F
43	HA-791	Elbow - Tubing	1	#69F

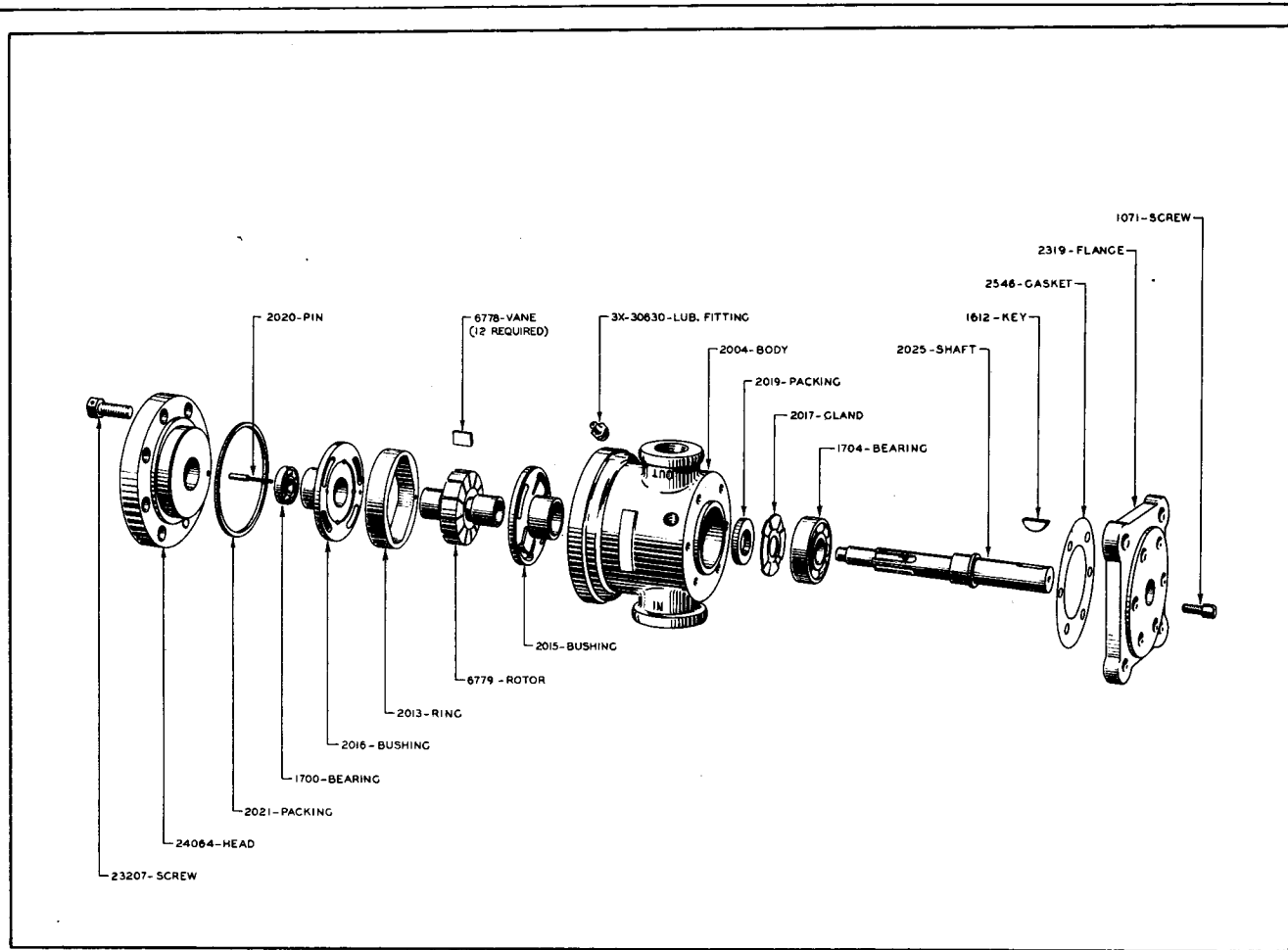


HYDRAULIC DIAGRAM FOR PAYLOADERS OF SERIAL NUMBERS 8048 & UP

PUMP AND HOSE GROUP

THIS GROUP PERTAINS TO MACHINES OF SERIAL NUMBERS FROM 8048 & UP

ITEM NO.	PART NO.	PART NAME	Used on Machines Of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-750	Oil Tank			1	
2		Plug - Sump 3/4 Std. Blk. 1. - Sq. Hd. . .			1	
3	HA-1069	Plug - Drain			1	
4	HA-1294	Bayonet Gage			1	
5	HA-1303	Cleanout Cover - Handhole.			1	
6	HA-902	Gasket - Cover			1	
7		Bolt - Cover - 3/8 - 16 Thd. Hex. Hd. x 1" lg.			4	
8	EW-198	Washer - Cover			1	
9	HA-1117	Strainer			1	
		Line - Oil Tank to Pump				
10	GH-8116A1	Swivel Union 1"			1	
11	HA-990	Hose - 1" Suction.			1	
12		Elbow - 1" Std. Blk. MI x 90 Banded . .			1	
13	HA-907	Nipple 1" Extra Heavy x 2-9/16 lg. . . .			1	
14	GH-8116A1	Swivel Union - 1"			1	
15	HA-771	Pump - (See page 56)			1	
		Line - Pump to Valve				
16	HA-790	Swivel Union 3/4			1	
17	HA-908	Nipple - 3/4 Extra Heavy x 3-1/16 lg. . .			1	
18	HA-1072	Elbow 3/4 Blk. MI x 90° 1500 WOG			1	#260H
19	HA-991	Hose - 3/4 Hi Pressure			1	
20	HA-790	Swivel Union			1	
21		Street Ell - 3/4 Std. Blk. MI x 90° Banded.			1	
22	HA-1047	Valve - (See page 59).			1	
23		Nipple Valve to Tank 1" Ex. Heavy x 2-1/2 lg.			1	
		Line - Valve to Tee				
24		Street Ell 3/4 Std. Blk. MI x 90 Banded.			1	
25	HA-989	Hose - 3/4 Hi Pressure			1	
26	HA-790	Swivel Union - 3/4			1	
27	HA-1070	Tee - 3/4 Forged 2000# WOG			1	#2124D
		Line - Tee to L.H. Ram				
28		Nipple - 3/4 Ex. Heavy Blk. Stl. x 5" lg.			1	
29	HA-1071	Elbow - 3/4 Forged x 90° 2000 WOG. . . .			1	#2120D
30		Nipple - 3/4 Ex. Heavy Close			1	
		Line - Tee to R.H. Ram				
31	HA-989	Hose - Between Rams 3/4 Hi Pressure. . .			1	
32	HA-790	Swivel Union - 3/4			1	
33	HA-1071	Elbow - 3/4 Forged x 90° 2000 WOG. . . .			1	2120D
34		Nipple - 3/4 Extra Heavy Close			1	
35	HA-762	Pump Support			1	
36	HA-763	Pump Drive Shaft			1	
37		Key - Drive Shaft - #11 Woodruff			1	
38		Key - Drive Shaft - #9 Woodruff			1	
39	HA-761	Flexible Coupling (Includes next 3 items).			1	
	HA-1409	Chain - Coupling			1	
	HA-1410	Connecting Links - Coupling.			1	
	HA-1408	Sprocket - Coupling.			2	
40	HA-760	Breather Tubing with Fittings (order with item 41)			1	
41	HA-791	Elbow - 1/4 Tube x 1/8 Pipe.			1	#69F
42	HL-3550	Clip - Tubing.			1	#TC79
43	HA-1022	Support - Ram Hose			1	
44	HA-1021	Support - Hi Pressure Hose			1	
45	HA-1315	Link - Valve Retainer.			1	

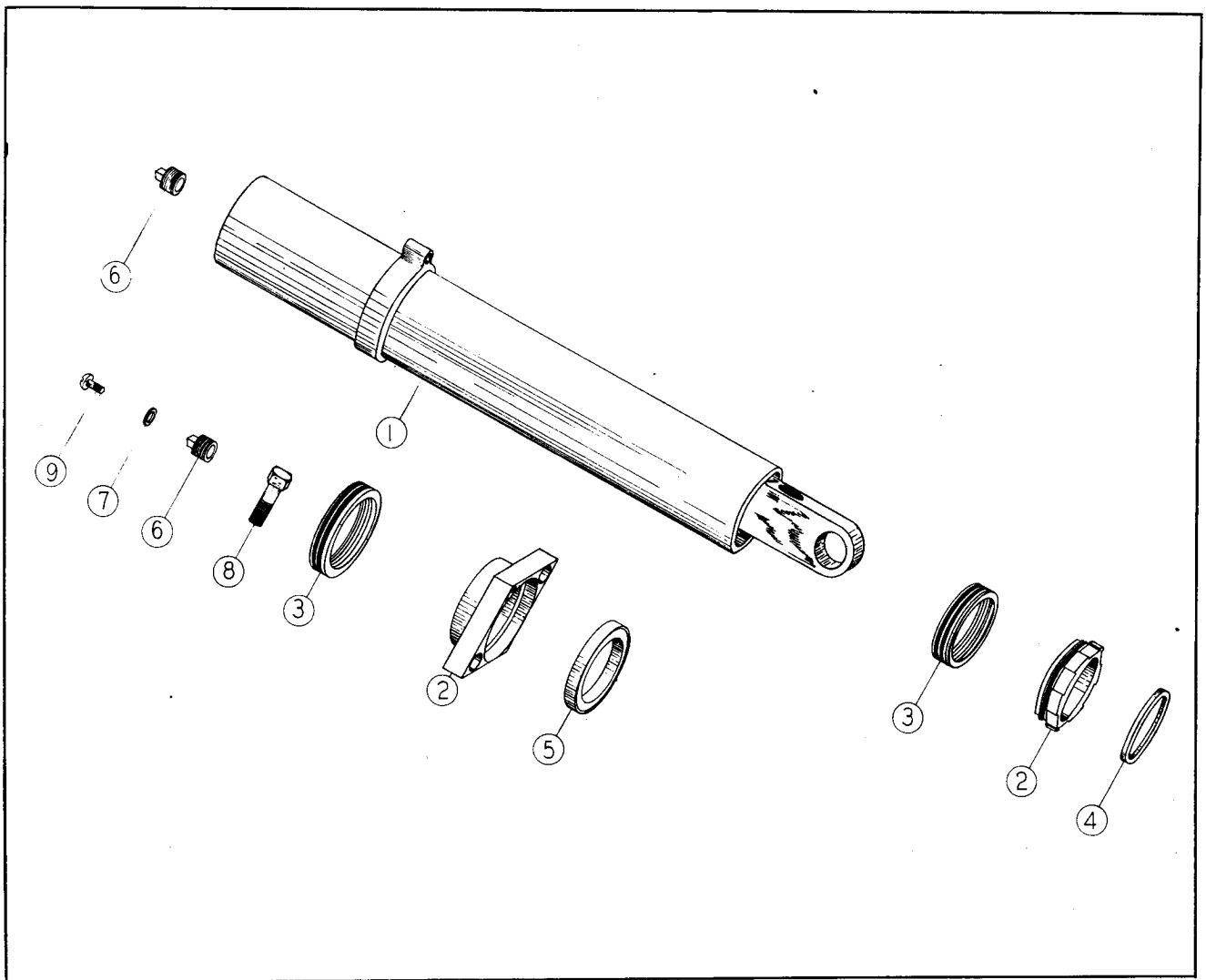


HYDRAULIC PUMP GROUP (HA-771)

ITEM NO.	PART NO.	QTY. REQ'D.	PART NAME
	HA-771	1	Hydraulic Pump Complete V-2105-C L.H. (Includes the following parts)
	23207	8	Screw
	24064	1	Head
	2021	1	Packing
	2020	1	Pin
	1700	1	Bearing
	2016	1	Bushing
	2013	1	Ring
	6779	1	Rotor
	6778	12	Vane
	2015	1	Bushing
	3X-30630	1	Lubricating Fitting
	2004	1	Body
	2019	1	Packing
	2017	1	Gland
	1704	1	Bearing
	2025	1	Shaft
	1612	1	Key - #11 Woodruff
	2546	1	Gasket
	2319	1	Flange
	1071	6	Screw

Be sure to give Serial Number of Payloader when ordering parts

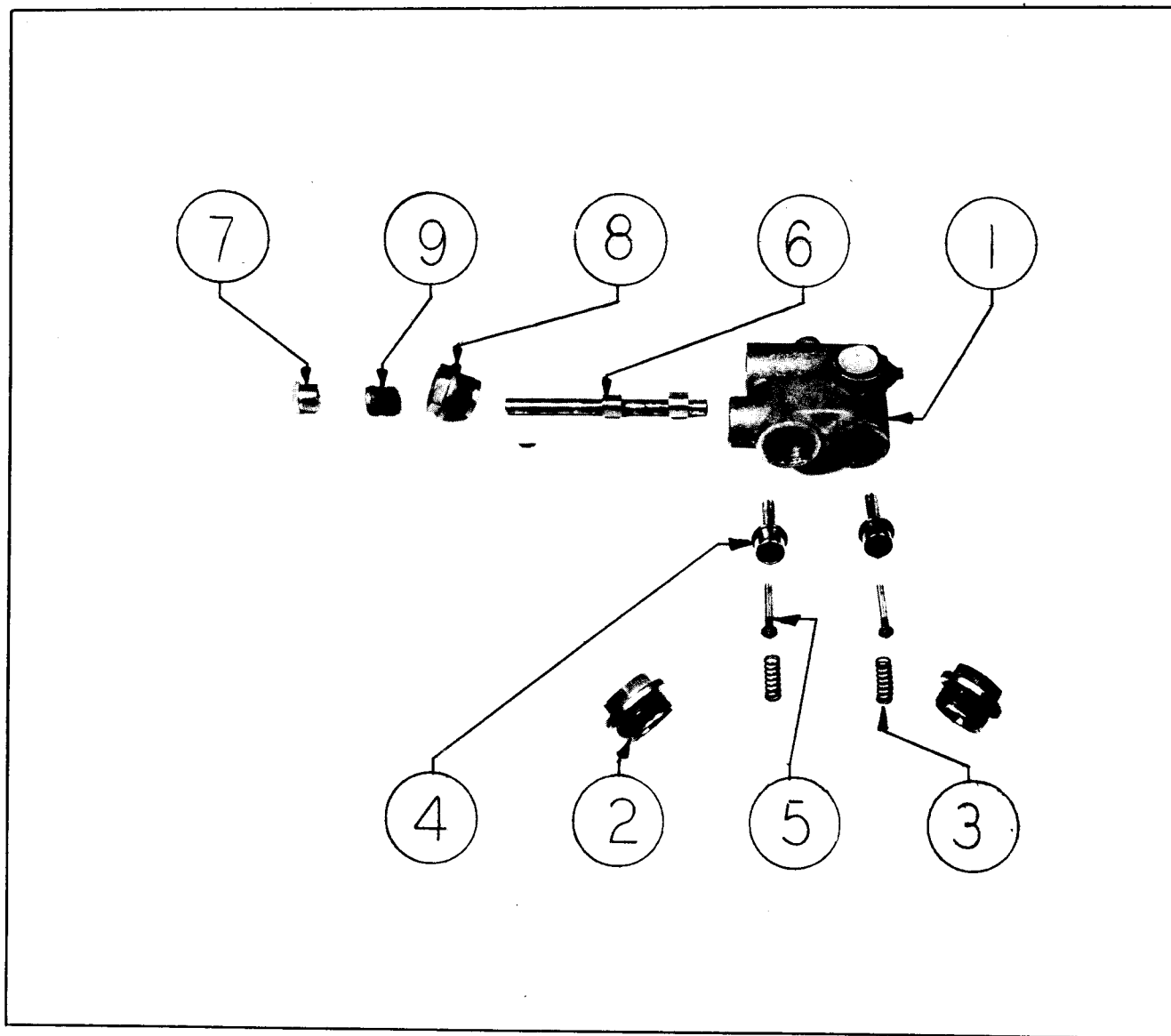
Don't order parts from illustration only, refer to list also



RAM ASSEMBLY GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
	HA-1280	Ram Assembly Complete (Replace with HA-1046)	8003	8047	2	
1	HA-1046	Ram Assembly Complete.	8048	up	2	18-S30-BAB-20
2	HA-1306	Cylinder Assembly.	8048	up	2	2130 x 50-20
2	HA-1307	Packing Nut.	8048	up	2	6930 x 4
3	HA-657	Packing Gland (For HA-1280 only)	8003	8047	2	
3	HA-1308	Packing Assembly	8048	up	2	X65D-4-3
3	HA-965	Packing Set (For HA-1280 only)	8003	8047	2	H-8388
4	HA-1309	Wiper Ring	8048	up	2	X62D-3-3
5	HA-889	Seal (For HA-1280 only).	8003	8047	2	4003K
6		Cylinder Plug - 1/2 Std. Stl. Pipe Plug (Bleeder).	8048	up	2	
6	HA-966	Cylinder Plug (For HA-1280 only)	8003	8047	2	320-D
7	HA-1031	Washer (For HA-1280 only).	8003	8047	1	10-L
8	HA-658	Bolt - Cylinder (For HA-1280 only)	8003	8047	4	
9		Bleeder Screw - #10-24 N.F. Thd. - Rd. Hd. x 3/4 Lg. (For HA-1280 only).	8003	8047	1	

Be sure to give Serial Number of Payloader when ordering Repair Parts



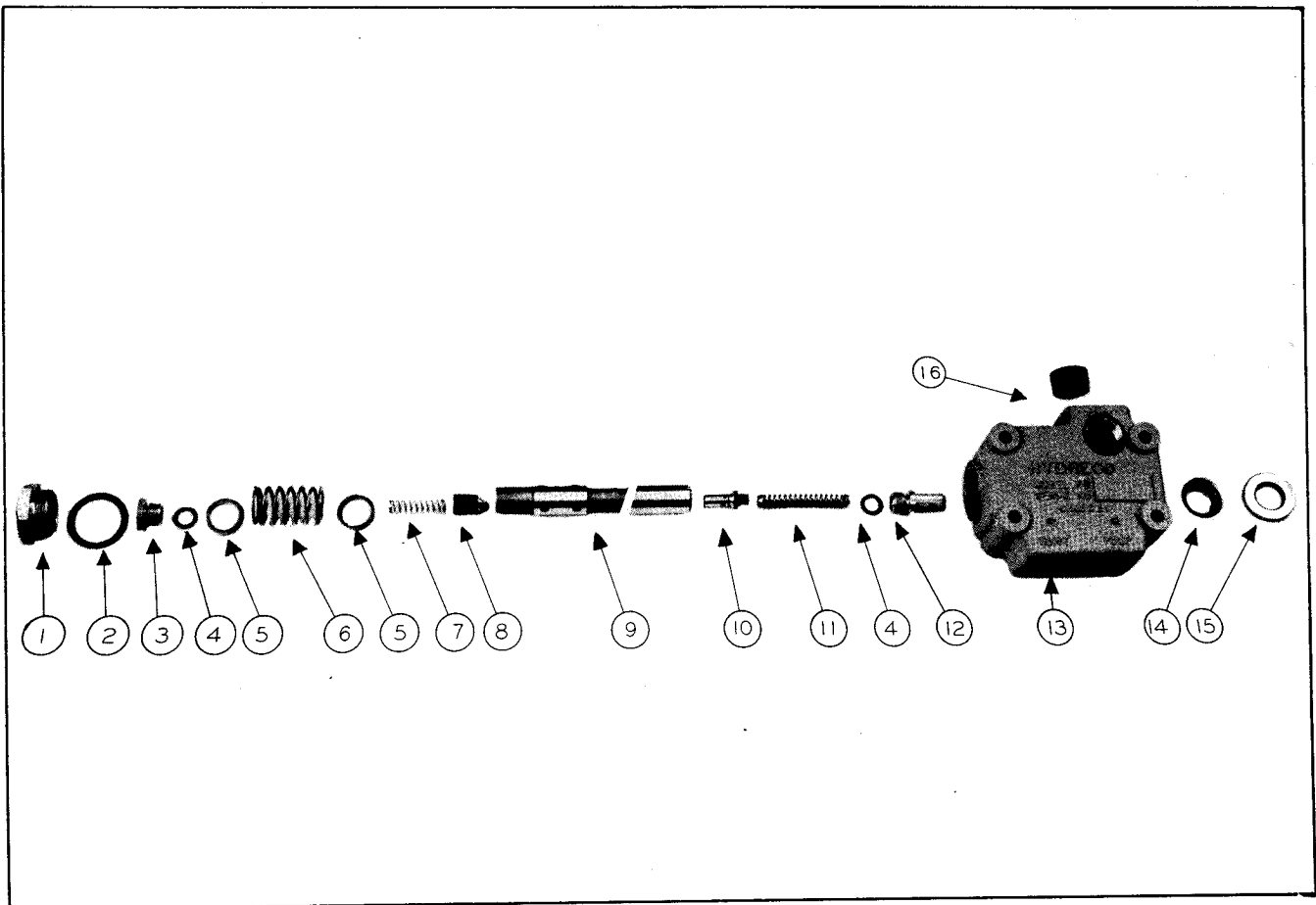
CONTROL VALVE GROUP (GH-565)

(For Payloaders Serial No. 8003 to 8047)

ITEM NO.	PART NO.	QTY. REQ'D.	PART NAME
	GH-565	1	Hydraulic Control Valve - Complete (Includes the following items)
1	GH-9005-B1	1	Valve Body
2	GH-9005-B2	2	Cap - Valve
3	GH-9010-B1	2	Spring - Valve
4	GH-9015-B1	2	Outer Poppet
5	GH-9016-A1	2	Inner Poppet
6	GH-9020-A1	1	Camshaft - Valve
7	GH-9025-A1	1	Packing Nut
8	GH-9030-A1	1	Packing Gland
9	GH-9035-A1	1	Packing Set

Be sure to give Serial Number of Payloader when ordering parts

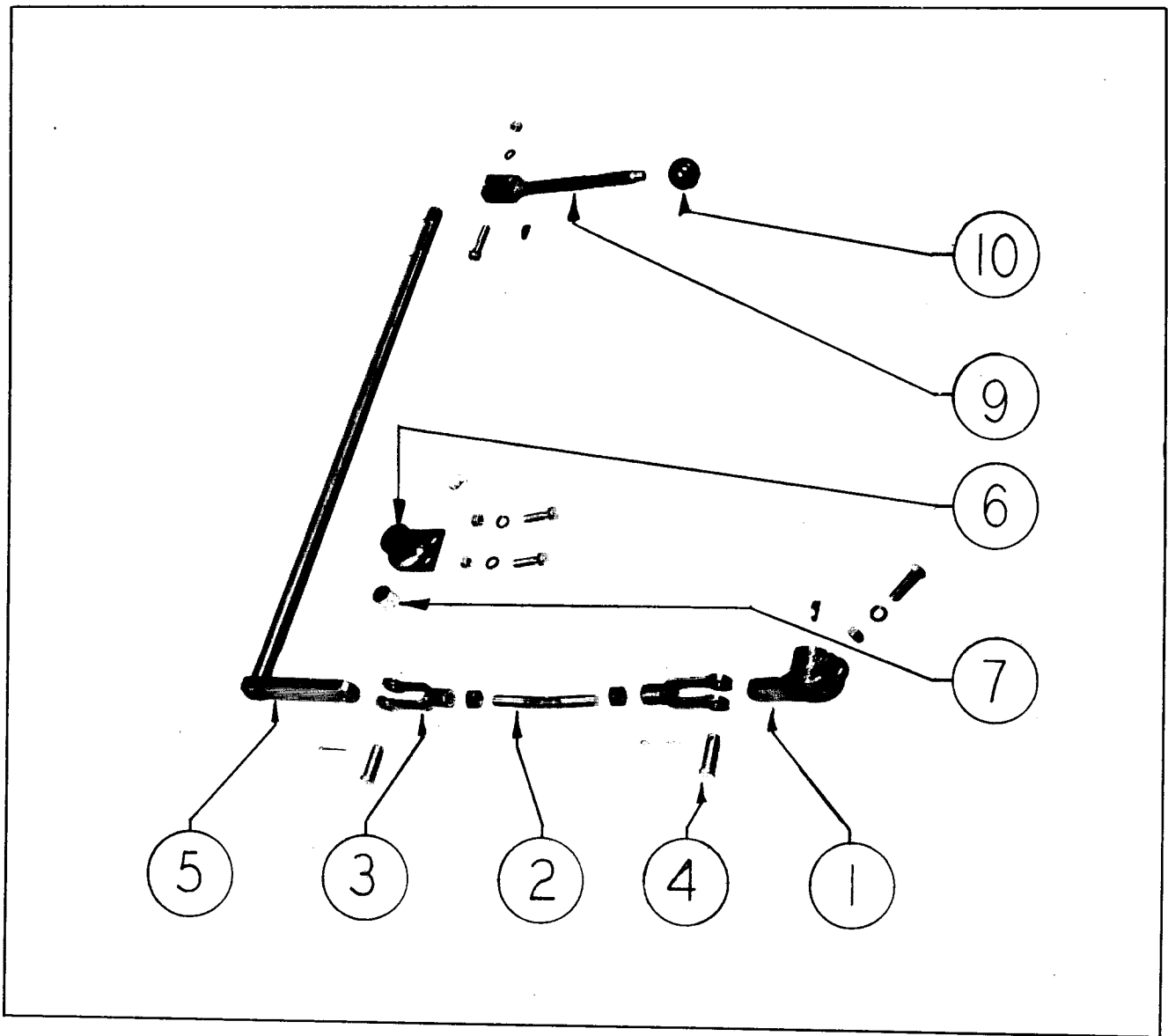
Don't order parts from illustration, only, refer to list also



CONTROL VALVE

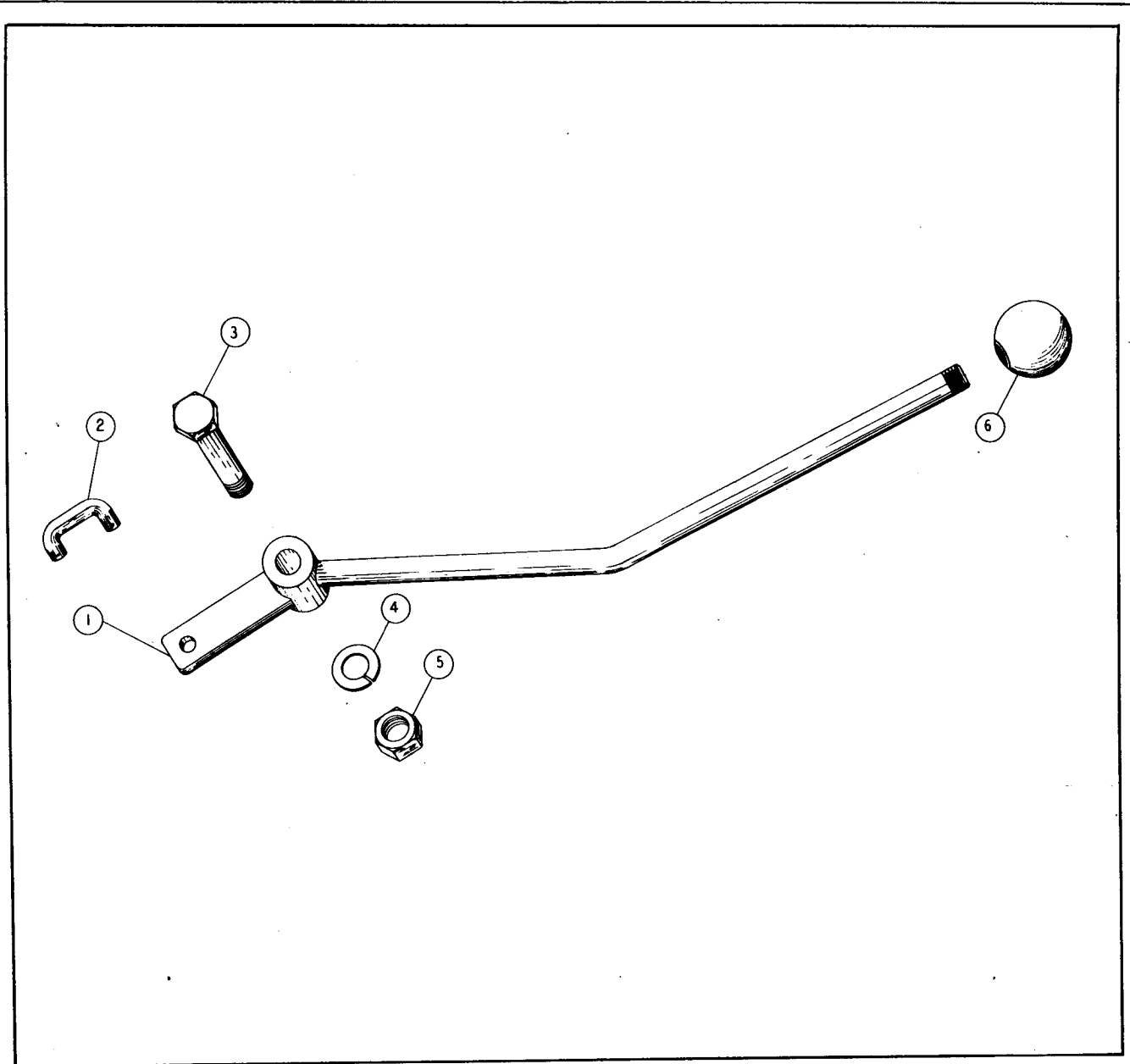
ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION		
			FROM	TO				
		This Group used on Payloaders of Serial Numbers 8048 & up (See Note below) . . .	8048	up	1	C5-V6-S		
1	HA-1047	Valve Complete (Includes the following) . . .					1	514x106
2	HA-1215	Cap.					1	Z1-26
3	HA-1216	Gasket					1	514x104
4	HA-1223	Check Valve Cap.					2	Z-27-4
5	HA-1227	Seal Ring.					2	Z-13-41
6	HA-1230	Washer					1	Z-10-139
7	HA-1229	Spring - Return.					1	Z-10-140
8	102460	Spring - Check Valve					1	513x14A
9	HA-1228	Check Valve Plunger.					1	512x88
10	HA-1221	Operating Plunger.					1	415x31
11	HA-1222	Relief Valve Plunger					1	Z10-187
12	HA-1226	Spring - Relief Valve.					1	516x15
13	HA-1224	Plunger Eye.					1	B525x89
14	HA-1214	Housing.					1	X54-21
15	HA-1217	Seal					1	X54-24
16	HA-1218	Seal Assembly.					1	X24-6
17	HA-1220	Pipe Plug - 1" Ctrsk. Pipe Plug.			1	X24-5		
	HA-1219	Pipe Plug (Not shown) 3/4 Ctrsk.			1	X24-5		

Manufacturer does not recommend overhauling these valves in the field because of critical clearances between spool & valve body. See the Frank G. Hough Co. Dealer for details on service & repair of these valves.



VALVE CONTROL LEVER

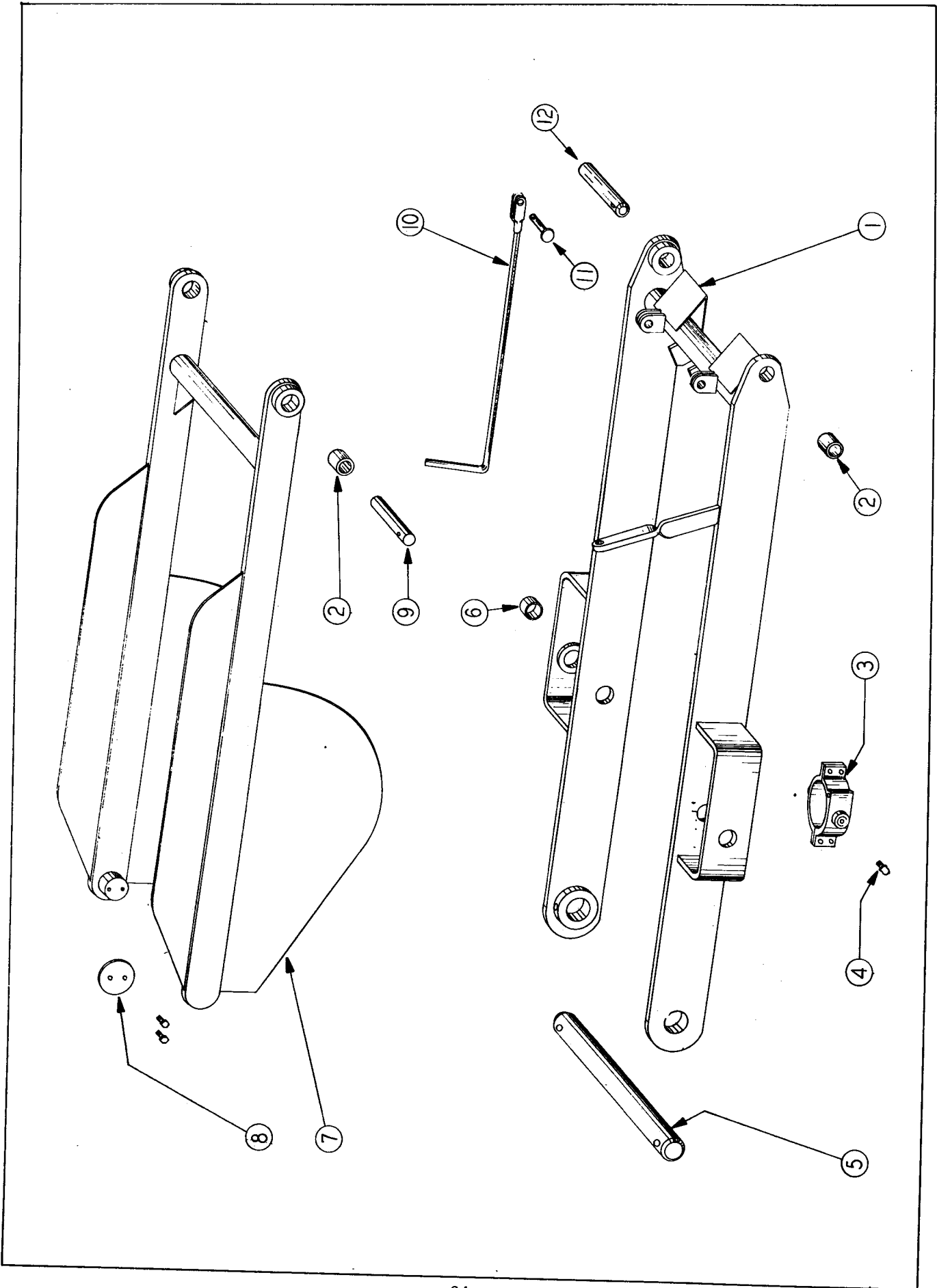
ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-815	The Following Parts used on Payloaders of Serial Numbers 8003 thru 8047 only).				
2	HA-819	Valve Lever.	8003	8047	1	
3	GH-211	Valve Rod.			1	
4	GH-212	Clevis - Valve Rod			2	
5	HA-820	Clevis Pin			2	
6	HA-823	Valve Control Shaft.			1	
7	HA-535	Bearing Support - Lower (Includes Item 7)			1	
8	HA-826	Bushing - Bearing Support.			2	
9	HA-829	Bearing Support - Upper - (Not shown) (Includes Item 7)			1	
10	HL-3343	Valve Control Lever.			1	
		Ball - Valve Control Lever			1	
		Key - Valve Levers - #9 Woodruff			2	



VALVE CONTROL LEVER

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-1092	Following Parts used on Payloaders of Serial Numbers 8048 & up.				
1	HA-1092	Hand Lever	8048	up	1	
2	HA-1096	Link			1	
3	HA-1097	Pin.			1	
4		Lockwasher - 1/2"			1	
5		Nut - 1/2" - 20 N.F. Hex.			1	
6	HL-3343	Knob			1	K-148

Be sure to give Serial Numbers of Payloader when ordering Repair Parts.

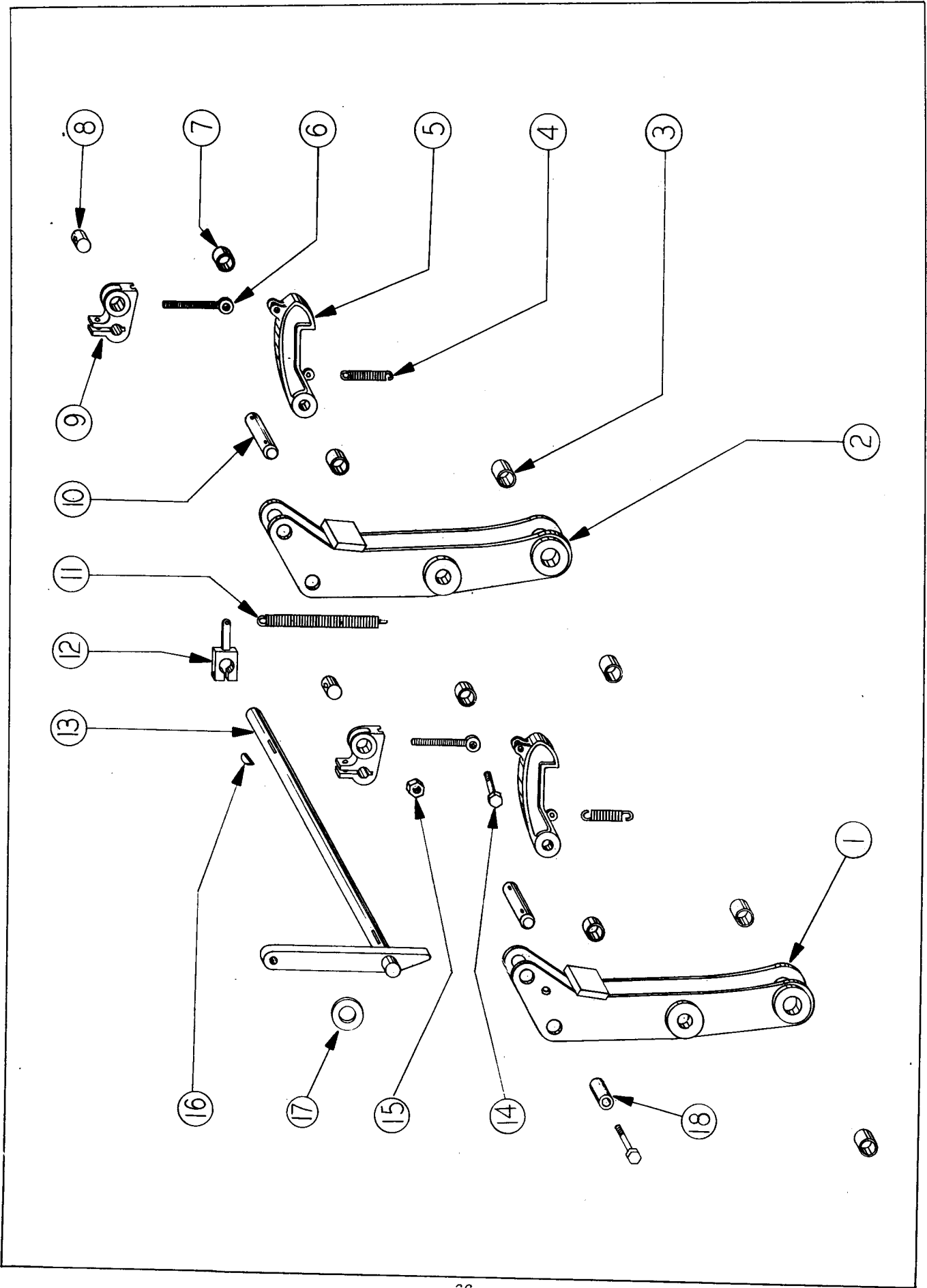


BOOM AND GUIDE GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-587	Boom	8003	up	1	
2	HA-670	Bushing - Guide & Boom Pivots.			4	
3	HA-1339	Trunnion.			2	
4	HA-1352	Grease Fitting - Trunnion.			4	
5	HA-671	Shaft - Boom to Frame.			1	
		Capscrew - Shaft to Boom - 7/16" N.F. Hex. Hd. x 4 Lg.			2	
6	101330	Bushing - Trunnion			4	
7	HA-680	Guide.			1	
8	HA-677	Retainer - Guide to Frame.			2	
		Capscrew - Retainer to Guide - 3/8" N.C. Hex. Hd. x 3/4" Lg.			4	
9	HA-707	Pin - Guide to Bucket.			2	
10	HA-696	Trip Rod - To Trip Lever			1	
11	GH-212	Pin - Trip Rod to Lever.			1	
12	HA-977	Pin - Boom to Carrier.			2	

Be sure to give Serial Number of Payloader when ordering Repair Parts

Don't order from illustrations only, refer to Part Number and Name of Part

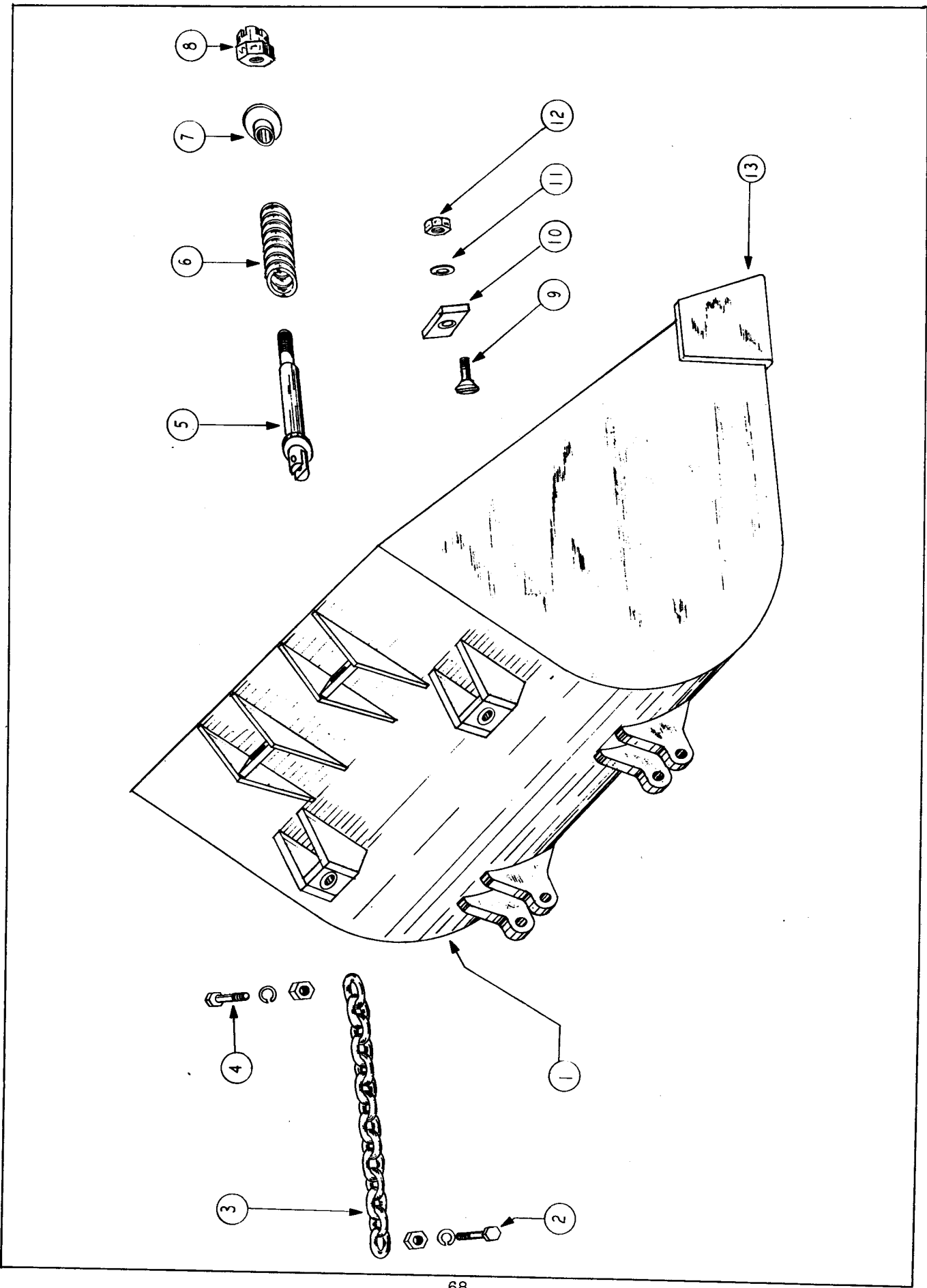


CARRIER GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-692	Bucket Carrier, R.H.			1	
2	HA-588	Bucket Carrier, L.H.			1	
3	HA-691	Bushing - Bucket Pivot			4	
4	HS-137	Spring - Latch Hook			2	
5	HA-698	Latch Hook			2	
6	GH-4523A1	Eyebolt - Latch Hook			2	
7	HA-976	Spacer - Latch Hook & Return Lever . . .			5	
8	GH-466	Cam Follower			2	
9	GH-4522B1	Cam.			2	
10	HA-975	Pin - Latch Hook to Carrier.			2	
11	HS-402	Spring - Trip Return			1	
12	HA-711	Lever - Return Spring.			1	
13	HA-693	Shaft - Latch Trip			1	
14		Pin - Eyebolt to Hook - 3/8" - 24 N.F. Bolt x 1-1/2" Lg. with Nut & Lockwasher.			2 4	
15		Nut - Eyebolt - 3/8" N.F. Hex.			4	
16		Key - Cam to Shaft - #18 Woodruff.			2	
17	HA-980	Spacer - Trip Lever.			1	
18	HA-979	Stop - Trip Lever.			1	
		Bolt - Nut & Lockwasher (Stop) - 3/8" N.F. Hex. x 2" Lg.			1	

Be sure to give Serial Number when ordering Repair Parts

Don't order from illustration only, refer to Part Number and Part Name



BUCKET GROUP

ITEM NO.	PART NO.	PART NAME	Used on Machines of Serial Numbers		QTY. REQ'D.	DESCRIPTION
			FROM	TO		
1	HA-589	Bucket - Complete (Includes Items 1 & 9 thru 13)	8003	up	1	
2	HA-1472	Bucket			1	
3	HA-708	Bolt, Lockwasher & Nut - 5/8" - N.F. Hex. x 3" Lg. (To Boom)			2	
4		Snap Chain			2	
5	HA-1014	Bolt, Lockwasher & Nut - 1/2" - N.F. Hex. x 2-1/4" (To Shaft)			2	
6		Snap Spring Shaft.			2	
7	HA-888	Snap Spring.			2	
8	HA-1485	Snap Spring Cap.			2	
9	HA-706	Nut - Spring Shaft - 1" - 14 N.F. Hex. Castle Nut.			2	
10		Capcrew - Shim - 3/8" - 24 N.F. Flat Hd. x 1-1/2" Lg.			2	
11		Shim - Latch Pocket.			2	
12	101693	Lockwasher - 3/8" Std.			2	
13		Nut - 3/8" - 24 N.F. Hex.			2	
		Cutting Edge - Bucket.	1			

Be sure to give Serial Number of the Payloader when ordering Repair Parts

Don't order from illustrations only, give Part Number and Name of Part

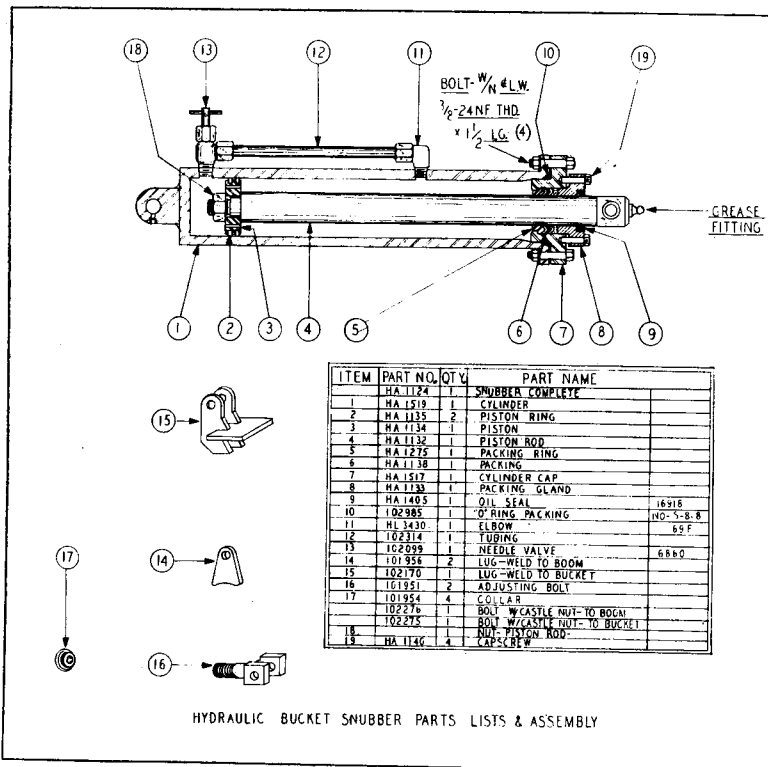
EXTRA EQUIPMENT

The HA Payloader has been designed by The Frank G. Hough Co. to meet most conditions encountered in the field by this type of loader. However, as an aid in overcoming unusual material handling problems, the extra equipment listed below may be obtained.

HA-1340	4 cu. ft. capacity concentrate bucket	36" wide
HA-1329	8 cu. ft. capacity round nose bucket	36" wide
HA-896	9 cu. ft. capacity bucket	36" wide
HA-1026	10 cu. ft. capacity round nose bucket	42" wide
HA-1383	10 cu. ft. capacity bucket	54" wide
HA-911	12 cu. ft. capacity bucket	48" wide
HA-890	15 cu. ft. capacity light bucket	60" wide

Bucket Teeth may be installed on any of the above buckets (except Round Nose) if desired.

102 012	Fork Bucket 48" wide
HA-1124	Hydraulic Bucket Snubber - (Dumping only). (See Illustration below)
HA-1331	Wheels with solid tires (Special conditions only)
HA-1114	Fire proof fuel tank
HA-1104	Water muffler & accessories
HA-1082	Flame and spark arresting exhaust system



LUBRICATION POINTS

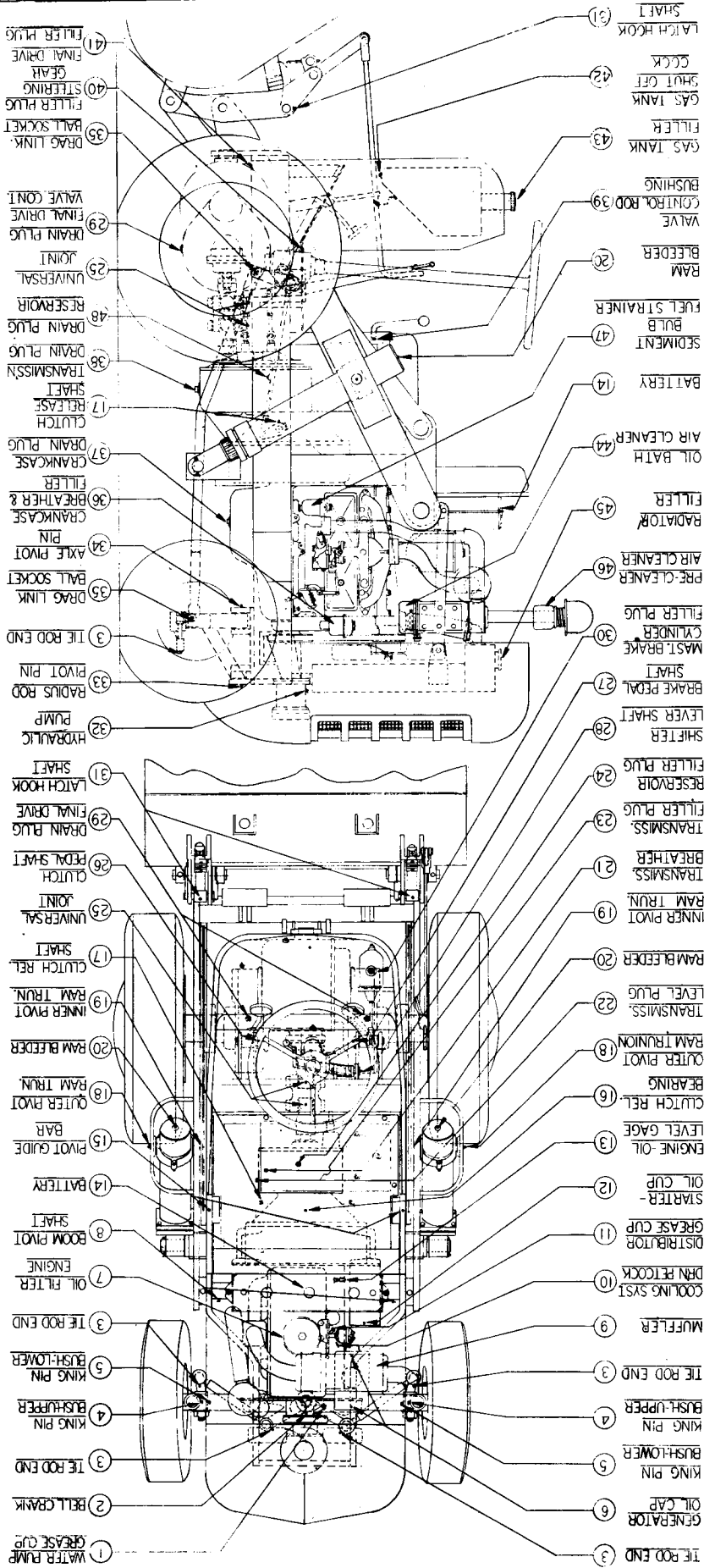
SEE LUBRICATION CHART ON PAGE 73

UNIT	Capacity (Approx.)	Lowest Expected Air Temperatures		
		Above 32° F	32° F to 0° F	Below 0° F
Engine Crankcase	5 qts.	SAE 30	SAE 20	SAE 10
Transmission	6-1/2 lbs.	SAE 140	SAE 90	SAE 90
Final Drive	15-1/2 lbs.	SAE 140	SAE 90	SAE 90
Hydraulic System	6 gal.	SAE 10	SAE 10	SAE 10

NOTE: CLEAN ALL FITTINGS THOROUGHLY BEFORE APPLYING LUBRICANT GUN.

1. **WATER PUMP - GREASE CUP.** Give grease cup one turn every 10 hours and refill with insoluble water pump grease every 60 hours.
2. **BELL CRANK.** Grease every 10 hours with a chassis lubricant.
3. **TIE ROD END - 2 points.** Grease every 10 hours with a chassis lubricant.
4. **KING PIN BUSHING - UPPER.** Grease every 10 hours with a chassis lubricant.
5. **KING PIN BUSHING - LOWER.** Grease every 10 hours with a chassis lubricant.
6. **GENERATOR - OIL CAP - 2 points.** 2 or 3 drops of light lubricating oil every 10 hours.
7. **OIL FILTER - ENGINE - FRAM #F-413.** Replace cartridge FRAM #C-4 every 200 hours at the same time engine crankcase oil is changed.
8. **BOOM PIVOT SHAFT - 2 points.** Grease every 10 hours with a chassis lubricant.
9. **MUFFLER - Tighten mounting bolts.**
10. **COOLING SYSTEM DRAIN COCK.** Drain cooling system here. Radiator cap is a pressure type cap and must be removed when draining the cooling system.
- *11. **DISTRIBUTOR GREASE CUP.** Give grease cup one full turn every 10 hours and refill with cup grease every 60 hours.
12. **STARTER.** Check cable connection every 60 hours. 1 point - 2 or 3 drops of light lubricating oil every 60 hours.
13. **ENGINE OIL LEVEL GAUGE.** Check crankcase oil every 10 hours. Add oil if necessary.
14. **BATTERY.** Battery liquid must cover plates. Check every 10 hours and add distilled water or clean rain water if necessary.
15. **PIVOT GUIDE BAR - 2 points.** Grease every 10 hours with a chassis lubricant.
16. **CLUTCH RELEASE BEARING.** Grease every 10 hours with a high melting point bearing grease. To grease this bearing it is necessary to remove seat, seat plate and transmission inspection cover.
17. **CLUTCH RELEASE SHAFT - 2 points.** Grease every 10 hours with a chassis lubricant.
18. **OUTER PIVOT - RAM TRUNION - 2 points.** Grease every 10 hours with a chassis lubricant.
19. **INNER PIVOT - RAM TRUNION - 2 points.** Raise booms to full height. Grease every 10 hours with a chassis lubricant.

20. RAM BLEEDER - Bleed Hydraulic System.
21. TRANSMISSION BREATHER. This is a special alemite air-vent type breather and requires no service.
22. TRANSMISSION LEVEL PLUG. Fill transmission to this level at this point. Use SAE 140 in summer and SAE 90 in winter. The capacity is 6-1/2 lbs. (See above chart).
23. TRANSMISSION FILLER PLUG. (See above note).
24. RESERVOIR FILLER PLUG. Fill Hydraulic Reservoir here. Level must be 3" from top of reservoir with bucket on ground or floor, or to "Full" mark on Bayonet Gage.
25. UNIVERSAL JOINT - 2 points. Remove 1/8" pipe plug and insert grease fitting. Grease every 60 hours with a chassis lubricant. Remove grease fitting when through and insert pipe plugs tightly.
26. CLUTCH PEDAL SHAFT. Grease every 10 hours with a chassis lubricant.
27. BRAKE PEDAL SHAFT. Grease every 10 hours with a chassis lubricant.
28. SHIFTER LEVER SHAFT. Grease every 10 hours with a chassis lubricant.
29. DRAIN PLUG - FINAL DRIVE. Drain final drive here. Drain every 400 hours and drain immediately after operation. Refill with SAE 140 for summer and SAE 90 for winter.
30. MASTER BRAKE CYLINDER. Fill cylinder here. Check every 60 hours and keep cylinder full of hydraulic brake fluid.
31. LATCH HOOK SHAFT - 2 points. Grease every 10 hours with a chassis lubricant.
32. HYDRAULIC PUMP. Grease every 60 hours with a high temperature sodium soap type grease.
33. RADIUS ROD PIVOT PIN. Grease every 10 hours with a chassis lubricant.
34. AXLE PIVOT PIN. Grease every 10 hours with a chassis lubricant.
35. DRAG LINK BALL SOCKET. Grease every 10 hours with a chassis lubricant.
36. CRANKCASE BREATHER & FILTER. Fill the engine crankcase here. Capacity 5 quarts. Clean breather every 60 hours.
37. CRANKCASE DRAIN PLUG. Drain crankcase here every 200 hours. Drain immediately after operation and refill with the best grade SAE 30 oil for summer and SAE 10 oil for winter.
38. TRANSMISSION DRAIN PLUG. Drain transmission here every 400 hours. Drain immediately after operation and refill with the best grade SAE 140 oil for summer and SAE 90 oil for winter.
40. FILLER PLUG - STEERING GEAR. Check level of lubricant every 200 hours. Add GMC #4567-M to keep full.
41. FILLER PLUG - FINAL DRIVE. Fill final drive here. Capacity 15-1/2 lbs. Fill with the best grade SAE 140 oil for summer and SAE 90 oil for winter.
42. GAS TANK SHUT OFF COCK. Shut off gasoline supply here.
43. GAS TANK FILLER. Fill gas tank here. Capacity approximately 6-1/2 gallons.
44. OIL BATH AIR CLEANER. Check oil cup every 10 hours. Refill with same viscosity oil as in engine crankcase, every 60 hours.
45. RADIATOR FILLER. Fill radiator here. Capacity approximately 3-1/2 gallons.
46. PRE-CLEANER - AIR CLEANER. Check every 10 hours; empty jar as soon as it becomes full. This is important!
47. SEDIMENT BULB. Remove and clean with gasoline every 10 hours.
48. DRAIN PLUG - RESERVOIR. Drain reservoir here every 200 hours of operation. Clean reservoir and refill with the best grade SAE 10 oil. When draining reservoir, break the connection on the hose connecting the rams to insure removing all oil from the hydraulic system.



- 1 WATER PUMP
- 2 GREASE CUP
- 3 THE ROD END
- 4 KING PIN
- 5 BUSH-UPPER
- 6 KING PIN
- 7 BUSH-LOWER
- 8 THE ROD END
- 9 KING PIN
- 10 BUSH-UPPER
- 11 KING PIN
- 12 BUSH-LOWER
- 13 THE ROD END
- 14 KING PIN
- 15 BUSH-UPPER
- 16 KING PIN
- 17 BUSH-LOWER
- 18 THE ROD END
- 19 KING PIN
- 20 BUSH-UPPER
- 21 KING PIN
- 22 BUSH-LOWER
- 23 THE ROD END
- 24 KING PIN
- 25 BUSH-UPPER
- 26 KING PIN
- 27 BUSH-LOWER
- 28 THE ROD END
- 29 KING PIN
- 30 BUSH-UPPER
- 31 KING PIN
- 32 BUSH-LOWER
- 33 THE ROD END
- 34 KING PIN
- 35 BUSH-UPPER
- 36 KING PIN
- 37 BUSH-LOWER
- 38 THE ROD END
- 39 KING PIN
- 40 BUSH-UPPER
- 41 KING PIN
- 42 BUSH-LOWER
- 43 THE ROD END
- 44 KING PIN
- 45 BUSH-UPPER
- 46 KING PIN
- 47 BUSH-LOWER
- 48 THE ROD END
- 49 KING PIN
- 50 BUSH-UPPER
- 51 KING PIN

- 1 WATER PUMP
- 2 GREASE CUP
- 3 THE ROD END
- 4 KING PIN
- 5 BUSH-UPPER
- 6 KING PIN
- 7 BUSH-LOWER
- 8 THE ROD END
- 9 KING PIN
- 10 BUSH-UPPER
- 11 KING PIN
- 12 BUSH-LOWER
- 13 THE ROD END
- 14 KING PIN
- 15 BUSH-UPPER
- 16 KING PIN
- 17 BUSH-LOWER
- 18 THE ROD END
- 19 KING PIN
- 20 BUSH-UPPER
- 21 KING PIN
- 22 BUSH-LOWER
- 23 THE ROD END
- 24 KING PIN
- 25 BUSH-UPPER
- 26 KING PIN
- 27 BUSH-LOWER
- 28 THE ROD END
- 29 KING PIN
- 30 BUSH-UPPER
- 31 KING PIN
- 32 BUSH-LOWER
- 33 THE ROD END
- 34 KING PIN
- 35 BUSH-UPPER
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- 37 BUSH-LOWER
- 38 THE ROD END
- 39 KING PIN
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- 41 KING PIN
- 42 BUSH-LOWER
- 43 THE ROD END
- 44 KING PIN
- 45 BUSH-UPPER
- 46 KING PIN
- 47 BUSH-LOWER
- 48 THE ROD END
- 49 KING PIN
- 50 BUSH-UPPER
- 51 KING PIN

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