



CLICK ANYWHERE FOR MORE DETAILS

MANUAL PREVIEW

Hough

Operator's Manual

H-60

Front End Loader

4 Wheel Drive

Operator's Manual

JENSALES.COM
or Call 800-443-0625



CLICK ANYWHERE FOR MORE DETAILS

THIS IS A MANUAL PRODUCED BY JENSALES INC. WITHOUT THE AUTHORIZATION OF
HOUGH OR IT'S SUCCESSORS. **HOUGH** AND IT'S SUCCESSORS
ARE NOT RESPONSIBLE FOR THE QUALITY OR ACCURACY OF THIS MANUAL.

TRADE MARKS AND TRADE NAMES CONTAINED AND USED HEREIN ARE THOSE OF OTHERS,
AND ARE USED HERE IN A DESCRIPTIVE SENSE TO REFER TO THE PRODUCTS OF OTHERS.

HO-O-H-60

OPERATORS - MAINTENANCE

CLICK ANYWHERE FOR MORE DETAILS

PAYLOADER® TRACTOR-SHOVEL

model
H-60
4-wheel-drive

BEGINNING WITH SERIAL NUMBER

28 AH-1001 AND UP

29 AC-1003 AND UP



or Call 800-443-0625

FORM
OM-H-60

HOUGH®



THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS

SUBSIDIARY - INTERNATIONAL HARVESTER COMPANY



IN CANADA - HOUGHCO PRODUCTS LTD.,
CANDIAC, QUE.

TABLE OF CONTENTS

TO THE OWNER	Inside Front Cover	Steering Hydraulic Circuit	3-70
		Electrical System	3-75
READERS GUIDE	ii	Frame, Linkage and Welding	
		Maintenance	3-84
SECTION I INTRODUCTION			
General	1-1		
Serial Numbers	1-1		
Preliminary Checks	1-3		
Safety Precautions	1-3		
Specifications	1-5		
SECTION II OPERATION			
General	2-1		
Operator's Compartment	2-1		
Instrument Panel	2-1		
Starting Controls	2-4		
Control Pedals	2-5		
Control Levers	2-6		
Normal Starting	2-8		
Operation Check	2-9		
Working The "PAYLOADER"	2-9		
Engine Shutdown	2-12		
Storage	2-13		
Towing	2-13		
SECTION III MAINTENANCE			
General	3-1		
Periodic Maintenance	3-1		
10 Hour Maintenance Operation	3-1		
100 Hour Maintenance Operation	3-8		
200 Hour Maintenance Operation	3-12		
500 Hour Maintenance Operation	3-18		
1000 Hour Maintenance Operation	3-21		
General Maintenance	3-25		
Fuel and Oil Handling	3-25		
Engine, Torque Converter and			
Transmission	3-27		
Drive Line	3-39		
Brake System	3-43		
Service Brake	3-43		
Parking Brake	3-50		
Steering System	3-52		
Tractor Hydraulic System	3-59		
Care of the Hydraulic System	3-59		
Tractor Loader and Steering			
Hydraulic Pump Assembly	3-62		
Tractor Hydraulic System			
Control Valves	3-63		
Loader Hydraulic System			
Cylinders	3-68		
		TABLE I	Normal Gauge Readings 1-10
		TABLE II	Lubrication and Refill
			Diagram 3-3
		TABLE III	Specific Gravity Temperature Correction Chart 3-11
		TABLE IV	Fan Belt Tensions 3-15
		LIST OF DIAGRAMS	
		Figure 3-2a	Lubrication and Refill Diagram 3-2
		Figure 3-28a	Transmission and Torque Converter Flow Diagram 3-28
		Figure 3-44a	Air Over Hydraulic Brake System Diagram 3-44
		Figure 3-57a	Steering Circuit Diagram 3-57
		Figure 3-58a	Tractor Hydraulic Flow Diagram 3-58
		Figure 3-71a	Steering Valve Hydraulic Flow Diagram 3-71
		Figure 3-76a	IH Electrical Diagram 3-76
		Figure 3-78a	Cummins Electrical Diagram 3-78
		Figure 3-78a	GM Electrical Diagram 3-80
		LIST OF TROUBLE SHOOTING CHARTS	
		ENGINE	3-32
		TORQUE CONVERTER AND TRANSMISSION	3-36
		DRIVE LINE	3-42
		BRAKE SYSTEM	3-51
		STEERING SYSTEM	3-56
		HYDRAULIC SYSTEM	3-73
		ELECTRICAL SYSTEM	3-82
		TRACTOR FRAME AND LINKAGE	3-87

LIST OF ILLUSTRATIONS

GENERAL.

1-1ia	General arrangement	1-ii
1-2a	Tractor serial number plate ..	1-2
1-5a	Exterior dimension	1-5
2-1ia	Operator's compartment	2-ii
2-1a	Instrument panel	2-1
2-2a	Hourmeter	2-2
2-11a	Bulk material loading sequence	2-11
3-2a	Lubrication and refill diagram	3-2

ENGINE, TORQUE CONVERTER AND TRANSMISSION.

1-2b	Transmission serial number plate	1-2
1-2c	Torque converter serial number plate	1-2
1-2d	IH engine serial number	1-2
1-2e	Cummins engine serial number	1-2
1-2f	GM engine serial number plate	1-2
2-2b	Fuel gauge	2-2
2-2d	Transmission clutch pressure gauge	2-2
2-3a	Torque converter temperature gauge	2-3
2-3b	Engine oil pressure gauge	2-3
2-3c	Engine temperature gauge	2-3
2-4c	Starting controls	2-4
2-5a	Cummins cold weather starting aid	2-5
2-5b	GM cold weather starting aid ..	2-5
2-6a	Transmission control levers ..	2-6
2-7b	Hand throttle lever	2-7
2-8a	Cummins cold weather starting decal	2-8
2-9a	GM cold weather starting aid	2-9
2-12a	GM shutdown controls	2-12
2-12b	GM emergency shutdown unit	2-12
3-5a	Engine oil level check	3-5
3-5b	Fuel tank fill cap	3-5
3-5c	Fuel filter drain	3-5
3-6a	Transmission fluid level check	3-6
3-8a	Crankcase breather cup (IH) ..	3-8
3-9a	Engine oil filter location (IH) ..	3-9
3-9b	Engine oil filter location (GM) ..	3-9
3-12a	Engine oil filter location (Cummins)	3-12

3-13a	Air cleaner assembly	3-13
3-14a	Crankcase breather (GM)	3-14
3-14b	Ventilator valve location (IH) ..	3-14
3-14c	Ventilator valve arrangement (IH)	3-14
3-14d	Fuel strainer and sediment bowl (IH)	3-14
3-15a	Fan belt tension check	3-15
3-15b	Corrosion resistor filter (Cummins)	3-15
3-19a	By-pass filter element and case (Cummins)	3-19
3-19b	Fuel pump filter screen (Cummins)	3-19
3-19c	Fuel filter (Cummins)	3-19
3-23a	Testing thermostat	3-23
3-28a	Transmission and torque converter flow diagram	3-28
3-29a	Torque converter temperature sender unit	3-29
3-29b	Clutch pressure line location ..	3-29

DRIVE LINE.

2-7c	Rear axle disconnect lever ...	2-7
2-10a	Tire patterns and their uses ..	2-10
3-9c	Wheel hub oil level check	3-9
3-9d	Differential oil level check	3-9
3-10a	Steering axle location fitting ..	3-10
3-40a	Drive shaft assembly	3-40
3-41a	Planetary final drives	3-41

BRAKE SYSTEM.

2-4b	Air pressure gauge	2-4
2-7d	Parking brake lever	2-7
3-6b	Air tank drain	3-6
3-44a	Air over hydraulic brake system	3-44
3-45a	Governor	3-45
3-45b	Brake treadle valve	3-45
3-46a	Checking brake lining wear ...	3-46
3-47a	Rear wheel brake shoe adjustment	3-47
3-47b	Front wheel brake shoe adjustment	3-47

STEERING SYSTEM.

3-52a	Steering gear (Saginaw)	3-52
3-53a	Steering gear (Ross)	3-53
3-54a	Steering gear adjusting screw ..	3-54
3-54b	Cylinder test gauge port	3-54
3-55a	Steering linkage adjustment ...	3-55
3-57a	Steering circuit diagram	3-57

HYDRAULIC SYSTEM.

2-2c	Hydraulic pressure gauge	2-2
2-6b	Boom control lever	2-6
2-7a	Bucket control lever	2-7
3-6c	Hydraulic oil level check	3-6
3-58a	Tractor hydraulic flow diagram	3-58
3-60a	Hydraulic reservoir	3-60
3-62a	Tractor loader and steering hydraulic system pump assembly	3-62
3-64a	Main control valve	3-64
3-66a	Main control relief valve adjustment	3-66
3-68a	Boom cylinder head assembly .	3-68
3-69a	Piston assembly	3-69
3-70a	Bucket cylinder head assembly	3-70
3-71a	Steering valve hydraulic flow diagram	3-71
3-72a	Steering system port location..	3-72
3-72b	Steering relief valve	3-72
3-72c	Flow divider - relief valve assembly	3-72
3-73a	Steering cylinder	3-73

ELECTRICAL SYSTEM.

1-3a	Battery installation	1-3
2-4a	Ammeter	2-4
3-10b	Battery state of charge	3-10
3-75a	Method of attaching booster cable	3-75
3-76a	IH electrical wiring diagram ..	3-76
3-78a	Cummins electrical diagram ..	3-78
3-80a	GM electrical diagram	3-80

TRACTOR FRAME, LINKAGE AND

WELDING MAINTENANCE.

3-85a	Welding process	3-85
3-86a	Cutting edge tip replacement ..	3-86

purchase full manual at

JENSALES.COM
or Call 800-443-0625

CLICK ANYWHERE FOR MORE DETAILS

INTRODUCTION

Reservoir type	Cylindrical, sealed	Circuit breaker type	Automatic reset
		Circuit breaker rating	40 amp.
Maximum reservoir pressure	15 - 30 PSI	CUMMINS ENGINE	
Filtration	2 replaceable, radial fin type elements	System watt hour rating	
		Tractor S/N	29AC-1003-1278 2400 whr.
Control valve make	Husco		29AC-1279 & UP 3600 whr.
Number of spools	2	Battery rating (each)	
Boom spool	Manual, four position, two position detent locked	Tractor S/N	29AC-1003-1278 200 amp. hr.
			29AC-1279 & UP 150 amp. hr.
Bucket spool	Manual, two-way spring centered	Generator make	Delco-Remy
Pressure regulator type	Adjustable, pilot operated	Generator model	1102059
		Generator direction of rotation (viewing drive end)	Clockwise
Cylinders		Generator output	30 amp. @ 14 V.
Boom	2 double acting, 4-1/2 in. diameter with chrome plated rods	Cranking motor make	Delco-Remy
		Cranking motor model	1114089
Bucket	1 double acting, 5 in. diameter with chrome plated rods	Cranking motor direction of rotation (viewing drive end)	Clockwise
		Cranking motor voltage	11.5 V.
		Maximum current draw (no load test)	115 amp.
		Minimum cranking speed (no load test)	5600 RPM
LOADER MECHANISM (Bucket Empty)		Regulator make	Delco-Remy
		Regulator model	1119001
Bucket closing time	2 sec.	Polarity	Negative
Bucket opening time	3 sec.	Ground connection	Negative battery terminal
Boom raising time	9 sec.	Circuit breaker type	Automatic reset
Boom lowering time	5 sec.	Circuit breaker rating	40 amp.
ELECTRICAL SYSTEM.		GM ENGINE	
IH ENGINE			
System watt hour rating	1536 whr.	System watt hour rating	2400 whr.
Battery rating (each)	64 amp. hr.	Battery rating (each)	200 amp. hr.
Generator make	Delco-Remy	Generator make	Delco-Remy
Generator model	1102059	Generator model	1106822
Generator direction of rotation (viewing drive end)	Clockwise	Generator direction of rotation (viewing drive end)	Clockwise
Generator output	30 amp. @ 14 V.	Generator output	50 amp. @ 13 V.
Cranking motor make	Delco-Remy	Cranking motor make	Delco-Remy
Cranking motor model	1107689	Cranking motor model	1113643
Cranking motor direction of rotation (viewing drive end)	Clockwise	Cranking motor direction of rotation (viewing drive end)	Clockwise
Cranking motor voltage	10.6 V.	Cranking motor voltage	11.6 V.
Maximum current draw (no load test)	112 amp.	Maximum current draw (no load test)	125 amp.
Minimum cranking speed (no load test)	3240 RPM	Minimum cranking speed (no load test)	5900 RPM
Regulator make	Delco-Remy	Regulator make	Delco-Remy
Regulator model	1119003	Regulator model	1119156E
Polarity	Negative	Polarity	Negative
Ground connection	Negative battery terminal	Ground connection	Negative battery terminal

OPERATION

Use the lower transmission speed ranges for bucket loading and transporting loads. The higher speed range may be used for making return trips to the loading site.

DUMPING.

As the dump area is approached, start raising the boom so that the bucket will clear. Decrease forward traveling speed and move forward slowly until the bucket is above the dumping point. Then stop motion by gradually applying the left brake treadle. Control the rate at which the bucket empties by gradually shifting the bucket lever to "OPEN." This will reduce the shock load transfer to the rear axles of the loader caused by the loss of weight from the bucket.

After the bucket empties, close it until the bucket cylinder pointer is in line with the mark on the cylinder. Back the loader away from the dump area, lower the bucket to carry position and return to the loading site.

ENGINE SHUTDOWN.

Give the engine a chance to gradually cool before shutting it down. By idling the engine three to five minutes before shutting it down, heat build-up at the engine combustion chambers, and bearings will be prevented. The engine lubricating system and the cooling system will carry the heat away before it can do harm.

Avoid long idling periods to prevent incomplete combustion due to low operating temperatures. Excess carbon may form in the combustion chambers and clog injector openings. Raw fuel left behind by incomplete combustion will wash lubricating oil off the cylinder walls and dilute engine oil to the extent that all moving parts in the engine will suffer from poor lubrication.

On tractors equipped with an IH or Cummins engine stop the engine by turning the ignition switch to "OFF."

On tractors equipped with a GM engine stop the engine by pulling out on the engine shutdown cable (figure 2-12a). After the engine has stopped running, push the cable in and lock it. Apply the parking brake before leaving the loader. The boom assembly should be lowered to the ground

and all control levers should be placed in their "NEUTRAL" or "HOLD" position.

Should a mechanical failure occur or the probability of one be indicated in the engine, transmission, final drives or the hydraulic system, the engine should be stopped as soon as possible. Practically all failures give some warning before the parts "let go" and ruin other components. By heeding such warning signs as a sudden drop in engine oil pressure, unusual noises, or erratic steering action etc., the damage caused by failures can be lessened. Never try to work the tractor when signs of a failure are present.



1. Emergency shutdown cable
2. Fuel shutdown cable

Figure 2-12a. GM shutdown controls



Figure 2-12b. GM emergency shutdown unit

CHANGE ENGINE OIL FILTER ELEMENT (IH & GM).

Oil filter location for either engine application is shown in figures 3-9a and 3-9b.



Figure 3-9a. Engine oil filter location (IH)

Change filter at engine oil change period. Replace element with an element recommended by engine manufacturer. For removal and replacement information, see Engine Operators Manual.



Figure 3-9b. Engine oil filter location (GM)

LUBRICATE DRIVE SHAFTS.

Apply chassis grease at all shaft splines and universal joints. Refer to Table II Lubrication and Refill. Prior to applying grease at a fitting, it should be wiped clean to prevent forcing dirt into the bearing retainers of the universal joints and splines. Use a hand gun to prevent seal damage.

CHECK OIL LEVEL IN WHEEL HUBS.

Clean each wheel hub and turn the wheel so the oil level mark on the cover is horizontal. Remove the fill-drain plug. The oil level should be even with the plug hole. If makeup oil is needed, add it through the plug hole until oil flows out. Install the fill-drain plug and wipe off excess oil.

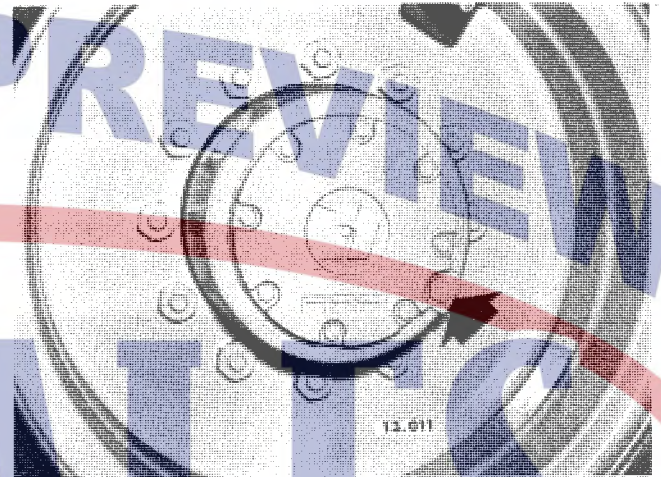


Figure 3-9c. Wheel hub oil level check

CHECK OIL LEVEL IN DIFFERENTIALS.

Clean the fill-check plug on each differential and remove the plug. The oil level should be even with the check plug hole. Should the level be low, use the oil recommended in Table II, Lubrication and Refill as makeup oil.

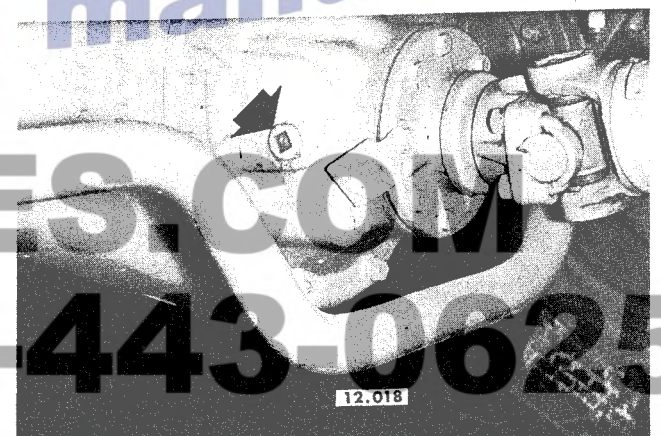
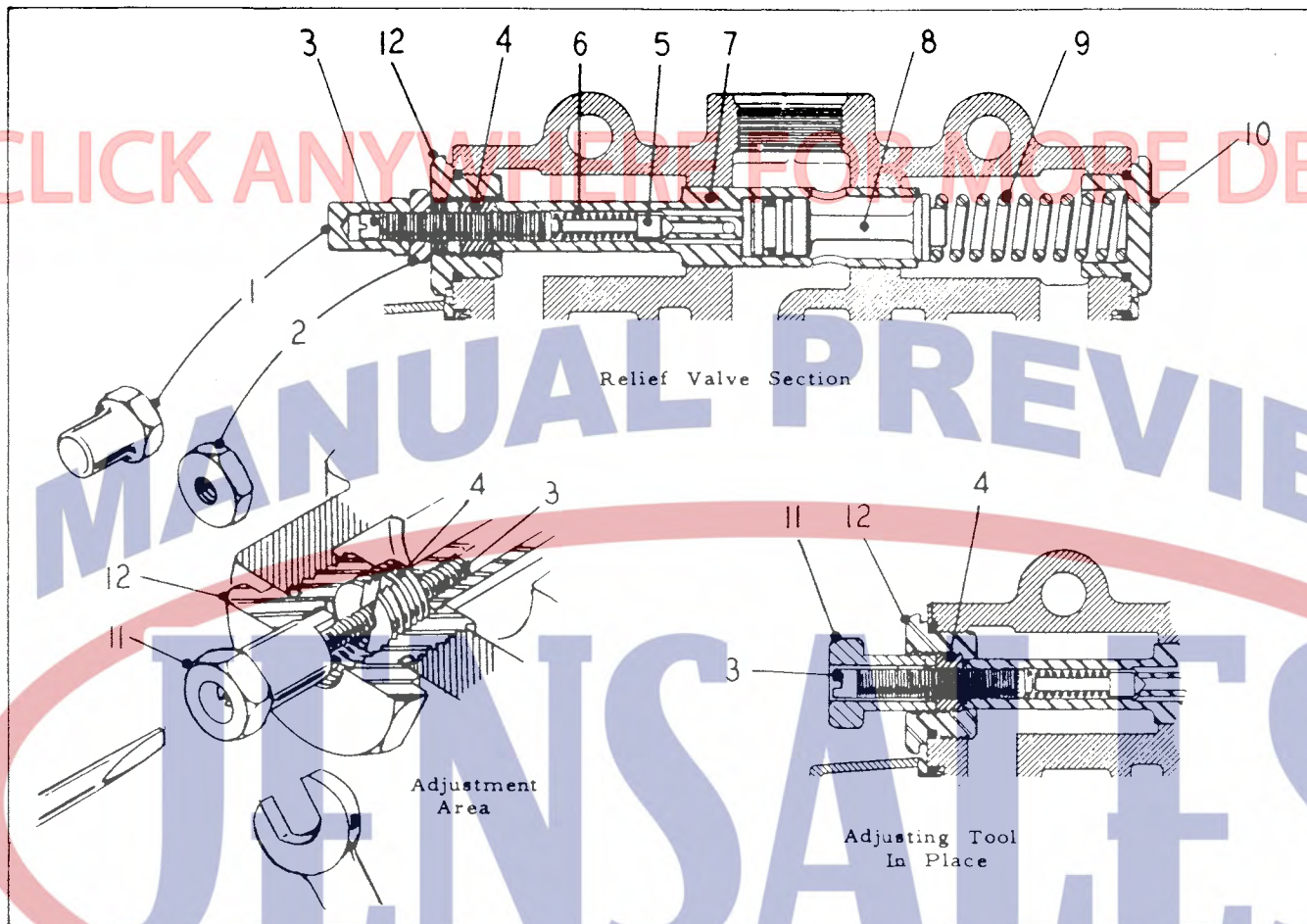


Figure 3-9d. Differential oil level check

CLEAN AXLE BREATHERS.

Remove accumulated dirt and oil from both the front and rear axle breathers. Turn the



- | | | |
|--------------------------|---------------------------|--------------------------|
| 1. Adjusting screw cover | 5. Pilot poppet | 9. Poppet spring |
| 2. Lock nut | 6. Pilot spring | 10. End plug |
| 3. Adjusting screw | 7. Adjusting screw sleeve | 11. Adjusting tool |
| 4. Inner adjusting nut | 8. Relief poppet | 12. Adjusting screw plug |

Figure 3-66a. Main control relief valve adjustment

To adjust the main control valve relief valve, proceed as follows:

- a. A pressure gauge is on the instrument panel, connected to the control valve. It is capable of registering pressure up to 3000 psi.
- b. Make sure that all loader controls are in neutral, and the parking brake is engaged. Start the engine and run it at a fast idle until engine temperature is normal. Move the bucket and boom control levers to circulate the oil throughout the system for several minutes. Then move the bucket control lever to the CLOSE position; run the engine at governed speed and observe the pressure registered on

the gauge. If the top gauge reading does not compare with that shown in Table I, Hydraulic Relief Valve Settings, it is necessary to adjust the relief valve in the main hydraulic valve.

- c. Remove the adjusting screw cover (1, figure 3-66a) and loosen the jam nut (2). Using a screwdriver, adjust the main hydraulic relief valve by turning the adjusting screw (3) clockwise to increase the pressure of the main hydraulic system and counterclockwise to decrease the pressure.
- d. When the system pressure is correctly adjusted, tighten the lock nut on the adjust-