FD 145

crawler dozer

Operation and Maintenance Instruction Manual

Print No. 604.00.506

WARNING

CAREFULLY READ THIS MANUAL BEFORE STARTING,OPERATING, MAINTAINING FUELING OR SERVICING THIS MACHINE

This symbol is your safety alert sign. It means ATTENTION! BE CAREFUL! YOUR SAFETY IS INVOLVED.

Read and heed every safety instruction indicated by the key words WARNING and DANGER.

The safety signs mounted on the machine which are colour-coded yellow, with black borders and letters, are WARNINGS; those red with white borders and letters indicate points of DANGER.

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SAFETY RULES

GENERAL

Study the Operation and Maintenance Instruction Manual before starting, maintaining, fueling, or servicing machine. Read and heed all machine-mounted safety signs before starting, operating, maintaining, fueling, or servicing machine.

Machine-mounted safety signs have been color coded yellow with black borders and lettering for **warning** and red with white borders and lettering for **danger** points.

Do not allow unauthorized personnel to service or maintain this machine.

Do not wear rings, wrist watches, jewelry, loose or hanging apparel, such as ties, torn clothing, scarves, unbuttoned, or unzipped jackets that can catch on moving parts. Wear proper safety equipment as authorized for the job. Examples: hard hats, safety shoes, heavy gloves, ear protectors, safety glasses or goggles, reflector vests, or respirators, depending on job conditions. Consult your employer for specific safety equipment requirements.

Keep operator's compartment, stepping points, grab rails and handles clean and free from foreign objects, oil, grease, mud or snow accumulation to minimize the danger of slipping or stumbling. Clean mud or grease from shoes before attempting to mount or operate machine.

Do not jump on or off machine. Keep two hands and one foot, or two feet and one hand, in contact with steps and grab rails and handles at all times.

Do not use controls or hoses as handholds when climbing on or off machine. Hoses and controls are movable and do not provide a solid support. Controls also may be moved inadvertently causing accidental machine or equipment movement.

Never attempt to operate the machine or its tools from any other position than seated in the operator's seat. Keep head, body, limbs, hand and feet inside operator's compartment at all times to reduce exposure to hazards outside the operator's compartment.

Be careful of slippery conditions on stepping points, hand rails, and on the ground.

Always wear non-slip safety boots or shoes.

Get off machine only when it is fully stopped. Always check height, width and weight restrictions in the working area, and be sure the machine will not exceed these limitations.

Be sure the exact locations of gas lines, utility lines, sewers, overhead and buried power lines and other obstructions or hazards are known. Such locations should be precisely marked by the proper authorities to reduce the risk of accidents. Obtain shutdown or relocation of any such facilities before starting work, if necessary. Know the working range of the machine.

Provide clearance for rear superstructure swing by barricading area to discourage entry.

Never exceed the lifting capacity of the machine. Stay within the lifting limits shown on the load charts provided with the machines.

START UP

Do not start or operate an unsafe machine. Walk completely around machine before mounting. Before working the machine, be sure that any unsafe condition has been satisfactorily remedied. Check that steering and attachment controls are in hold (neutral) position and, also, that safety lever is released before moving. Advise the proper maintenance authority of any malfunction part or system. Be sure all protective guards or panels are in place, and all safety devices provided are in place and in good operating condition.

Before starting machine, check, adjust and lock the operator's seat for maximum comfort and control of the machine. Be sure all people in the area are clear of the unit before moving the machine or its attachments. Sound horn.

Obey flagman, safety signals and signs.

Due to the presence of flammable fluid, never check or fill fuel tanks, storage batteries, or use starter fluid near lighted smoking materials or open flame or sparks.

Starting fluid is flammable. Follow the recommendations as outlined in the Operation and Maintenance Instruction Manual and as marked on the containers. Store containers in cool, well ventilated place secure from unauthorized personnel. **Do not puncture or burn containers.** Follow the recommendations of the manufacturer for storage and disposal.

Never use starter fluid near lighted smoking materials or open flame or sparks due to the presence of flammable fluid.

Make sure nobody is near the work area of the excavator before starting the machine, or before swinging or moving in any direction.

Adjust all mirrors for visibility towards the rear of the machine.

Be sure the throttle setting is adequate for the contemplated operation.

If controls or other hydraulic systems feel spongy have the machine checked for air in the systems. Presence of air in these systems could cause improper control and result in an accident. See the Operation and Maintenance Instruction Manual for corrective procedures.

OPERATING

Do not run the engine of this machine in closed areas without proper ventilation to remove deadly exhaust gases which would otherwise concentrate in the ambient air.

Keep operator's compartment clear of loose objects. Do not use machine to carry loose objects by means other than attachments designed for such objects.

Do not carry riders.

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SPECIFICATIONS

ENGINE

Make and Model: FIAT 8065.25.099
Diesel cycle, 4-stroke, direct-injection, with exhaust gas driven turbocharger.
Number of cylinders: 6
Bore x Stroke: 104 x 115 mm (4.10 x 4.52 in)
Total Piston Displacement: 5861 cc (358 cu. in)
Compression ratio: 16.5 to 1
Rated speed: 2100 RPM
Rated speed at max. torque: 1500 RPM

Lubrication System

Type : Force-fed by gear pump.
Oil filters: Strainer on pump suction line. Full flow in delivery line through two replaceable cartridge filters.
Engine oil cooled by heat-exchanger through engine coolant.
Low oil pressure warning light in DATA MONITOR PANEL.

Engine Valves

Overhead valves, camshaft in cylinder block.

Intake:	
- Opens - B.T.D.C.	12°
- Closes - A.B.D.C.	31°
Exhaust:	
- Opens - B.B.D.C.	50°
- Closes - A.T.D.C.	16°

Valve clearance:

- Intake	0.25 mm (0.010 in)
- Exhaust	0.35 mm (0.014 in)

Fuel System

Fuel pump, piston type.
In line injection pump, integral all-speed governor and automatic advance variator.

Setting of injection pump to engine: 25°±1° before T.D.C. and cyl. 1 in the compression stroke (start of delivery).

Injection order : 1-5-3-6-2-4
Fuel injectors release pressure: 230 - 238 bar (3335 - 3451psi)
Throwaway cartridge fuel filters.
Dry type, paper - cartridge air cleaner with centrifugal separator. Restriction indicator light on dashboard (EDM).

Cooling System

Coolant, force-circulated by centrifugal pump.
Radiator: 5 tube row core.
Fan: 7 blade, pusher.
Coolant circulation between engine and radiator governed by thermostat.
Engine coolant temperature and level indicators on dashboard (EDM).

Starting

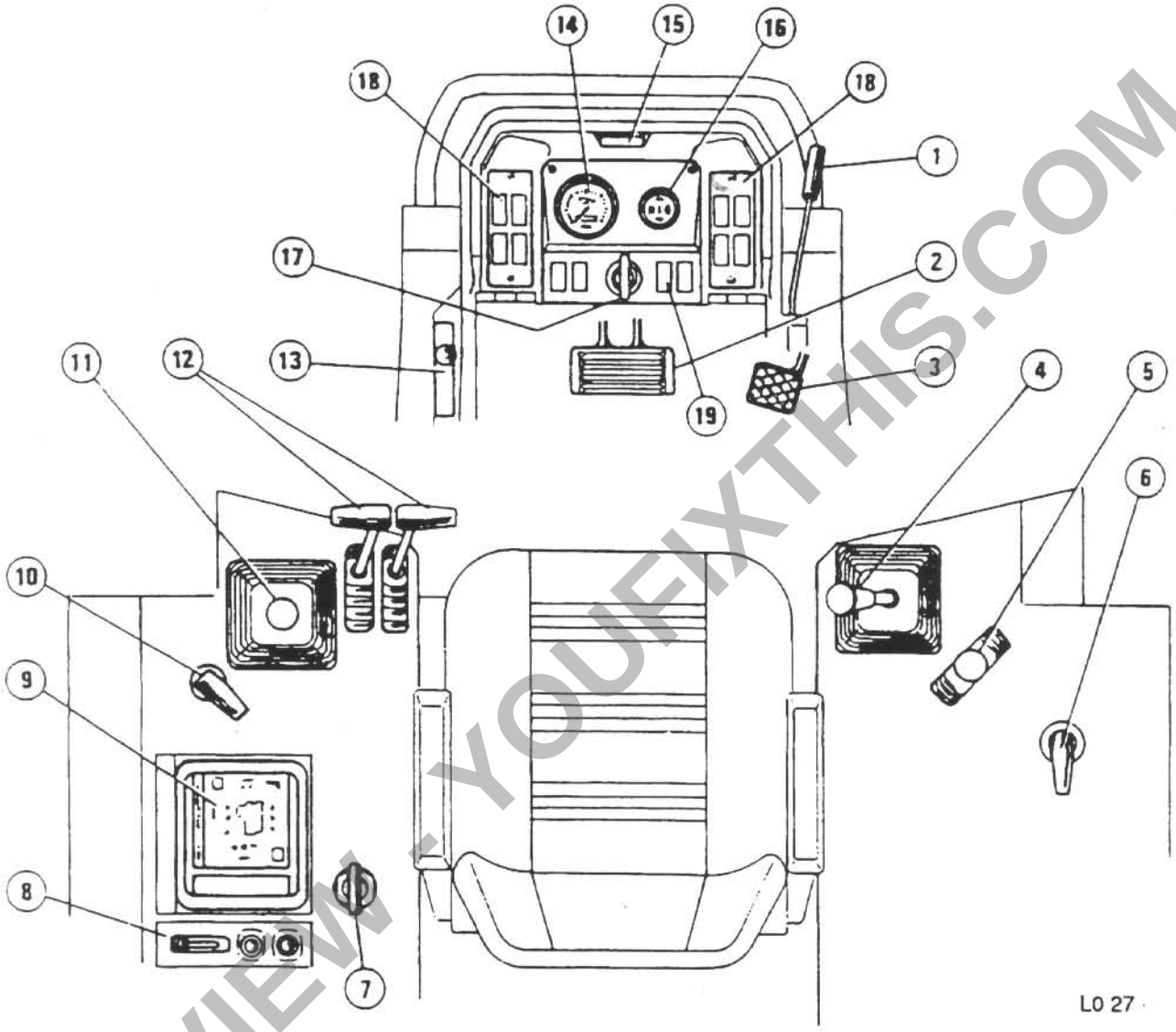
By electric motor.

POWER TRAIN

Hydraulic torque converter.
Stall torque ratio 2.34 to 1.
Powershift transmission providing three speeds forward and three reverses, controlled by hydraulic mechanism acting on five clutches.
Pilot control gearshift lever located on the left side of the operator.
Safety lock lever in "locked" position prevents the use of gearshift lever and applies automatically the service brakes.
Torque converter/transmission oil cooling through heat exchanger with coolant recirculated from radiator.
Oil filtration: two full-flow filters, one mesh type and magnetic rod on suction line and one with cartridge and built-in by pass valve on delivery line.

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CONTROLS AND INSTRUMENTS



Note - The terms "left" and "right" as referred to in this manual, are determined by sitting in the operator's seat, looking forward.

1. ENGINE THROTTLE LEVER

Forward = idle speed;
Backward = max acceleration.

2. BRAKE PEDAL

By pushing the pedal, braking of both tracks is controlled.

3. ENGINE DECELERATION PEDAL

Used for temporary engine R. P. M. speed reduction.

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MACHINE OPERATION

⚠ WARNING

Never attempt to use machine or attachment except when seated in the operator's seat. Keep head, body, limbs, hands and feet inside operator's compartment to reduce exposure to hazards outside the operator's compartment.

Keep attachments low or in a position for maximum visibility and control of machine.

Never use the implements as a man lift.

Do not start suddenly at full speed against a tow chain or cable. Take up slack carefully.

Only designated towing or pulling attachment points are to be used for towing or pulling. Use care in making attachment. Be sure pins and locks, as provided, are secure before pulling.

Keep all people clear of attachments and tools while in raised position, to prevent possible injury.

Do not coast the machine at any time with transmission in neutral.

Always check work area for dangerous features. The following are examples of dangerous work areas: slopes, overhangs, timber, demolitions, fire, high walls dropoffs, back fills, rough terrain, ditches, ridges, excavations, heavy traffic, crowded parking, maintenance and closed areas. Use extreme care when in areas such as these.

Work on sloping ground is dangerous.

Be particularly careful when working near overhanging banks or where cave - ins may occur. Use a signal person when visibility of the work area by the Operator is inadequate. The signal person must be in direct communication with the operator who must pay close attention to the signals.

Be on the lokout for caving edges, slides or falling objects. Beware of concealment by brush and undergrowth or other obstacles of these dangerous conditions.

When working in or nearby wells, trenches or in proximity of high banks, shore or brace as required to prevent cave-ins.

Before working in the vicinity of gas lines or other utility lines always contact the nearest utility office before beginning work.
You and the utility representative must jointly determine what specific precautions must be taken to insure safety.

Work in proximity of overhead or underground power lines involves serious body injuries and death hazards, thus special precautions must be taken according to national and local safety regulations.

For the purposes of this Manual you are considered to be working in the proximity of power lines when the attachment or the load raised by machine, in any position, can reach to within the minimum distances specified by local and national safety regulations.

Slow down the operating cycle. Reaction time may be too slow and distances may be misjudged.

NOTE:
Generally when the operator first gets on the machine he must practice raising and lowering the implements.
This will enable the operator to get the feel of the controls and learn how they respond to the control lever positions.
Keep in mind that when the levers are in hold position the implements become a rigid unit with the machine: in other words, the implements will follow any up and down or sideway movement of the machine.

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MAINTENANCE

MAINTENANCE WARNINGS

Do not allow unauthorized personnel to service or maintain this machine. Study the Operation and Maintenance Instruction Manual before, starting, operating, maintaining, fueling or servicing this machine.

Never lubricate, service or adjust with the engine running except as called for in the Operation and Maintenance Instruction or Service Manuals, to keep from being caught in moving parts or by a moving machine.

Shut down machine according to manual procedure before lubricating or any other servicing.

Always lower attachments to ground and relieve pressure before servicing unit.

The attachment can be lowered in response to attachment control lever movements, with or without engine power.

When any supporting machine component must be removed or installed and jacks are used, be sure the support of the jack at the machine and on the ground are appropriate to the load to be applied. Transfer the load to authorized blocking or jack stand immediately.

Do not work on or under the machine or its components while supported only on a jack or other lifting device, according to local or national requirements.

Do not work under or near attachment articulations or other machine parts unless they are properly supported and blocked.

Always turn the MASTER SWITCH to the "OFF" position before cleaning, repairing, servicing or parking the machine to prevent injury.

Always set safety levers in locked position.

Never use gasoline or solvent or other flammable fluid to clean parts. Use authorized commercial, non - flammable, non - toxic solvents.

DO NOT USE HANDS to search for pressure leaks. Fluid escaping under pressure can have sufficient force to penetrate the skin causing injuries.

When servicing or maintenance requires access to areas that cannot be reached from the ground, use a ladder or step platform that meets safety requirements to reach the service point. Perform all service or maintenance carefully.

Lift and handle parts with a lifting device of proper capacity. Be sure parts are supported by proper slings and hooks according to local or national requirements. Use lifting eyes if provided. Watch out for people in the vicinity.

Use only grounded auxiliary power source for heaters, chargers, pumps and similar equipment to reduce the hazard of electrical shock, according to local or national requirements.

Do not run the engine of this machine in closed areas without proper ventilation to remove deadly exhaust fumes.

Warn all people who may be servicing or working around machine before starting engine.

Keep hands and face away from the loosened line nuts while performing fuel line and nozzle tests. Also, wear safety glasses with side shields or goggles.

Use proper tools to bring holes into alignment. DO NOT USE FINGERS OR HANDS.

Do not use an open flame as a light source to look for leaks or for inspection any where on the machine.

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FLUID CAPACITIES

ITEM	QUANTITY	FIAT PRODUCT		REFILL
	Liters	Brand	Product	
Cooling system	39	PARAFLU	PARAFLU11	50-50 mixture of water and coolant. Has adequate protection against: oxidation, foaming, corrosion, scaling and freezing down to -35°C (-31°F)
Fuel tank	295	-	-	Diesel fuel ASTM no 2 type TT
Engine	12,5	AMBRA SUPER	AMBRA SUPER	Engine oil MIL-L- 2104 D or Service API "CD"
Convertor/transmision	34	TUTELA	Gl/m	ATF type A SUFFIX A
Bevel-gear, Steering clutches brakes	29,5	AMBRA SUPER	AMBRA SUPER	Engine oil MIL-L-2104 D or Service API "CD"
Attachment Hydraulic System - attachment "BD" - attachment "AD" (mechanical tilt) - attachment "AD" (hydraulic tilt - 1 cyl)	 56 (°) 54 (°) 56 (°)	IDRAULICAR AP	IDRAULI-CAR AP31 and AP51	Engine oil MIL-H-24459 or or DIN 51524/51525
Side Final Drives (each)	17	TUTELA	W90/M-DA	Oil for mechanical drives MIL-L-2104D
Track idlers and rollers	4 (°)	AMBRA SUPER	AMBRA SUPER	Engine oil MIL-L-2104D or Service API "CD"
Grease fittings	-	TUTELA	G9	Lithium-calcium base grease, - N.L.G.I. No 2 consistency
Cab tipping pump	0,5 (°)	TUTELA	Gl/m	

The quantities of oil shown are what is needed for periodical replacements following the rules for discharging and refilling indicated in detail for each group.

(°) - First refill

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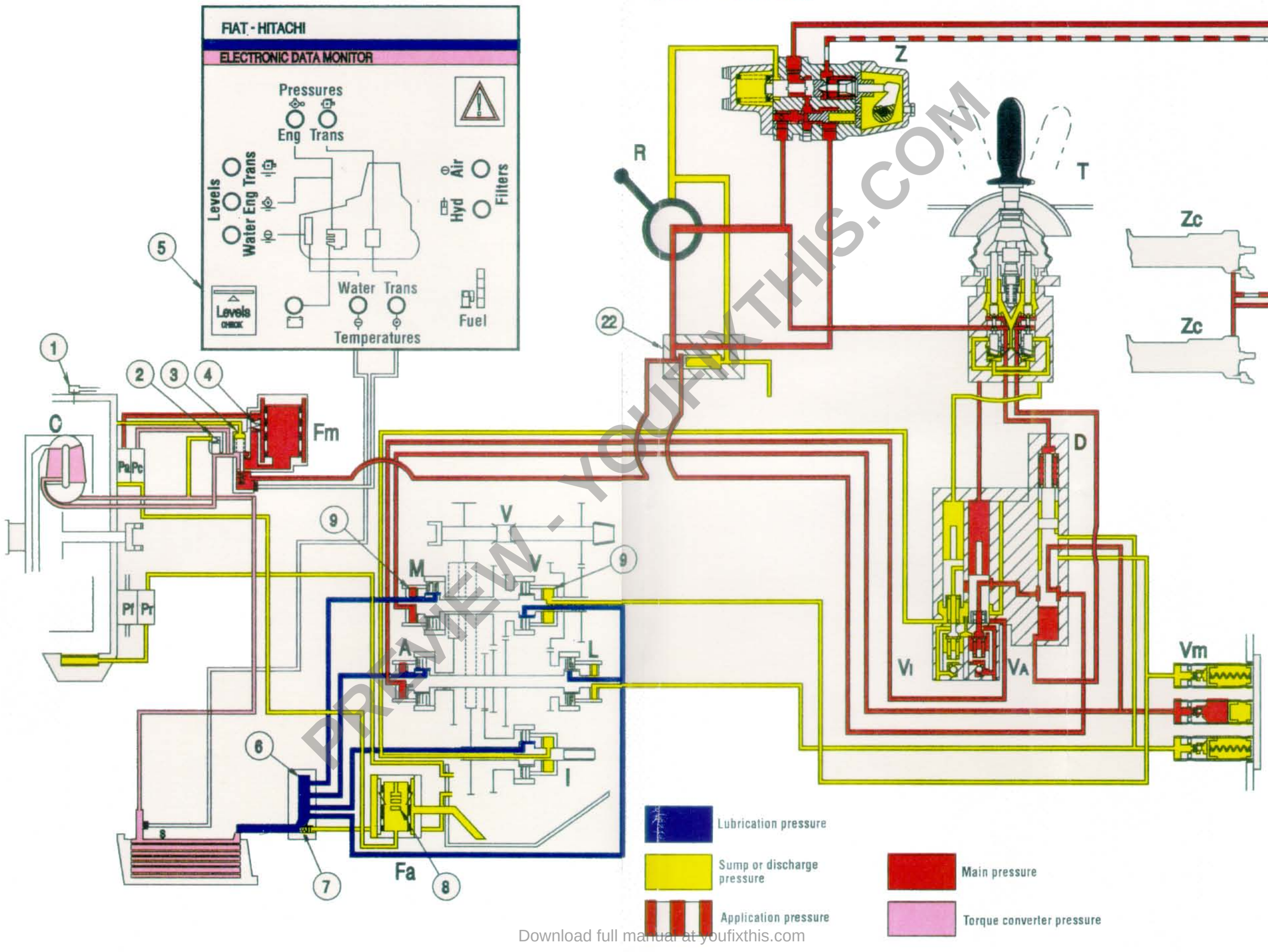
WIRING DIAGRAM

1. Connection socket for external booster
2. Batteries
3. Master Switch
4. Starter Motor
5. Key engine starter switch
6. Starter relay
7. Fuel enrichment solenoid
8. Starting aid button (for cold weather)
9. Cold starting solenoid valve
10. Engine stop
11. Fuse 7,5 A
12. Cab ceiling light
13. Cigarette lighter and portable lighter socket
14. Pulse generator
15. Electronic tachometer
16. Front right light
17. Front left light
18. Fuse 7,5 A
19. Front cab work light switch
20. Fuse 7,5A
21. Front right cab work light
22. Front left cab work light
23. Rear cab work light switch
24. Fuses 7,5 A
25. Rear lights ON indicator (incorporated in number 23)
26. Rear right cab work light
27. Rear left cab work light
28. Lights switch
29. Fuses 7,5A
30. Horn
31. Back-up alarm pressure switch
32. Back-up alarm
33. Side window washer button
34. Side windshield washer electropump
35. Front/back windshield washer electropump
36. Fuse 7,5A
37. Left side door windscreen wiper switch
38. Left windshield wiper motor
39. Fuse 7,5A
40. Electrical junction box
41. Right windshield wiper motor
42. Fuse 7,5A
43. Front/back windscreen washer button
44. Front windshield wiper motor
45. Fuse 7,5A
46. Front/back window wiper switch
47. Back window wiper motor
48. Fuse 20A
49. Visual brake warning indicator
50. Arrangement for radio connector
51. Alternator
52. Fuse 4A
53. Right brake wear indicator switch
54. Left brake wear indicator switch
55. Visual brake wear indicator
56. Engine water temperature sensor
57. Air cleaner restriction sensor.
58. Hydraulic oil filter restriction sensor
59. Transmission oil temperature sensor
60. Hour meter
61. Engine oil and hourmeter low pressure sensor
62. Fuel level sensor
63. Engine coolant level sensor
64. Engine oil level sensor
65. Engine oil pressure gauge (optional)
66. Transmission oil level sensor
67. Transmission oil low pressure sensor

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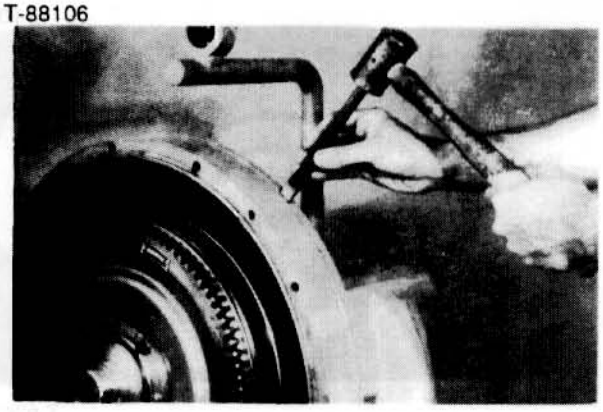
TRANSMISSION HYDRAULIC SCHEMATIC
(2nd - forward)



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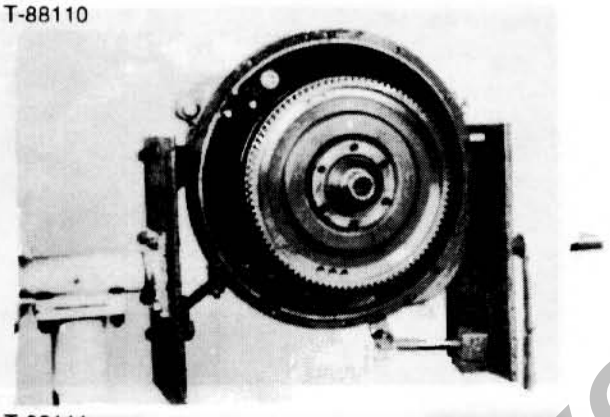
2.4.1.3 DISASSEMBLY

2.4.1.3.1
Remove the engine to converter adapter ring.

⚠ WARNING

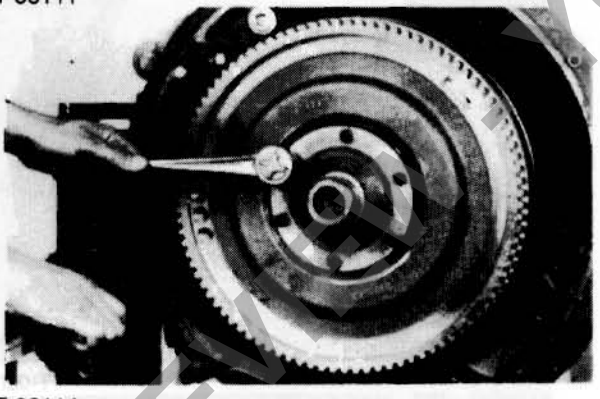
It is unsafe to strike hardened steel parts with anything other than a soft iron or non-ferrous hammer. When installing or removing such parts, wear safety glasses with side shields and heavy gloves, etc., to reduce the possibility of injury.

T-88110



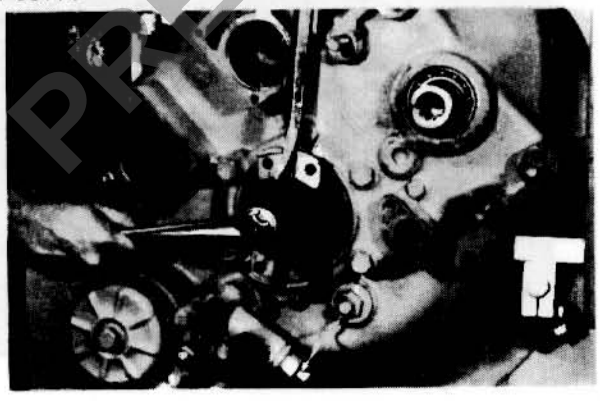
2.4.1.3.2
Place converter on revolving stand.

T-88111



2.4.1.3.3
Remove hub.

T-88114



2.4.1.3.4
Unlock and remove retaining plate capscrews. Remove retaining plate, o-ring and connecting shaft flange.

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NUTS (ZNT)					SCREWS (ZNT/DEIDR)		
Resistance class: 10 (R80)					Resistance class: 10.9 (R100)		
Diameter and step mm	Normal daNm	Low type daNm	with polyamide ring		Diameter and step mm	Normal ZNT daNm	Selflocking ZNT daNm
			normal da Nm	low type daNm			
M6x1	1.3	1.2	-	-	M6x1	1.3	-
M8x1.25	3.2	2.6	3.9	3.2	M8x1.25	1.3	3.5
M10x1.25	7.2	5.2	8.2	6.2	M10x1.25	7.1	7.9
M10x1.5	6.5	5	7.7	6	M10x1.5	6.5	7
M12x1.25	13	8.7	14.5	10.2	M12x1.25	12.7	13.9
M12x1.75	11	8.1	12.9	9.6	M12x1.75	11	12
M14x1.5	19.5	13	21.6	15	M14x1.5	20	22
M14x2	18	12.5	20	14.6	M14x2	18	19
M16x1.5	30	17	34	20	M16x1.5	30	33
M16x2	-	-	-	-	M16x2	-	-
M18x1.5	45	25	50	29	M18x1.5	45	48
M18x2.5	-	-	-	-	M18x2.5	-	-
M20x1.5	60	30.5	64.5	35	M20x1.5	60	65
M20x2.5	-	-	-	-	M20x2.5	-	-
M22x1.5	80	41	-	-	M22x1.5	80	90
M22x2.5	-	-	-	-	M22x2.5	-	-
M24x2	100	47	108	52.5	M24x2	100	110
M24x3	-	-	-	-	M24x3	-	-
M27x2	95	40.1	-	-	M27x2	100	-
M30x2	130	49.4	-	-	M30x2	140	-
M33x2	170	-	-	-	M33x2	190	-
M36x3	220	-	-	-	M36x3	240	-

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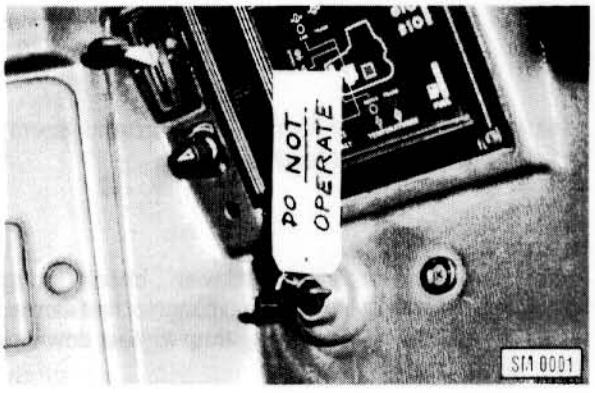
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SYMPTOM	PROBABLE CAUSE	TOOLS REQUIRED	TEST	SOLUTION
Low lube oil pressure indicator light turns on with engine running.	Low transmission oil level	Operator's manual	Pull dipstick and check level	Fill transmission with specified oil and to proper level
	Blocked converter pump suction filter			Clean the filter
	External leakage allowing air to enter pump		If oil foams, check for leakage	Correct leakage
	Defective hose		Restriction in suction hose	Replace or clean hose
	Incorrect oil	*Operator's manual*	*Compare oil specification* with factory data	Drain old and replace with the specified grade and quantity of oil.
	Defective indicator		Nothing seems to correct problem	Replace indicator

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1.4 REPAIR PROCEDURES



1.4.1 ENGINE & CONVERTER

1.4.1.1 REMOVAL

1.4.1.1.1

Place machine on a level surface. Turn master electrical switch to the "OFF" position. Tag the unti with a "DO NOT START" tag.

Refer to the CAB Section of this manual and tilt the cab.

⚠ WARNING

Always turn the master switch to the "OFF" position before cleaning, repairing, servicing or parking the machine to prevent injury.

1.4.1.1.2

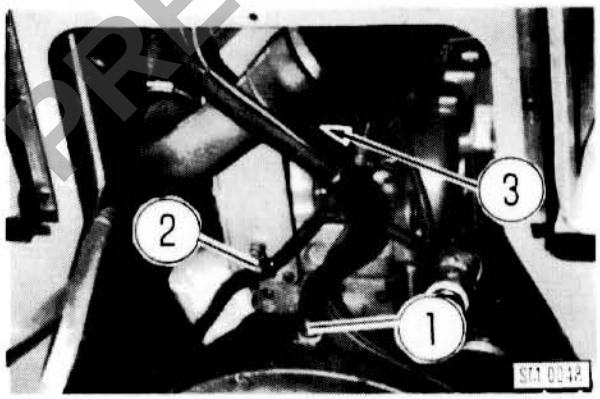
Remove the center belly guards.



1.4.1.1.3

Disconnect windshield and door window washer hoses from engine, hood and side doors support.

NOTE: Plug lines to keep from draining reservoirs.



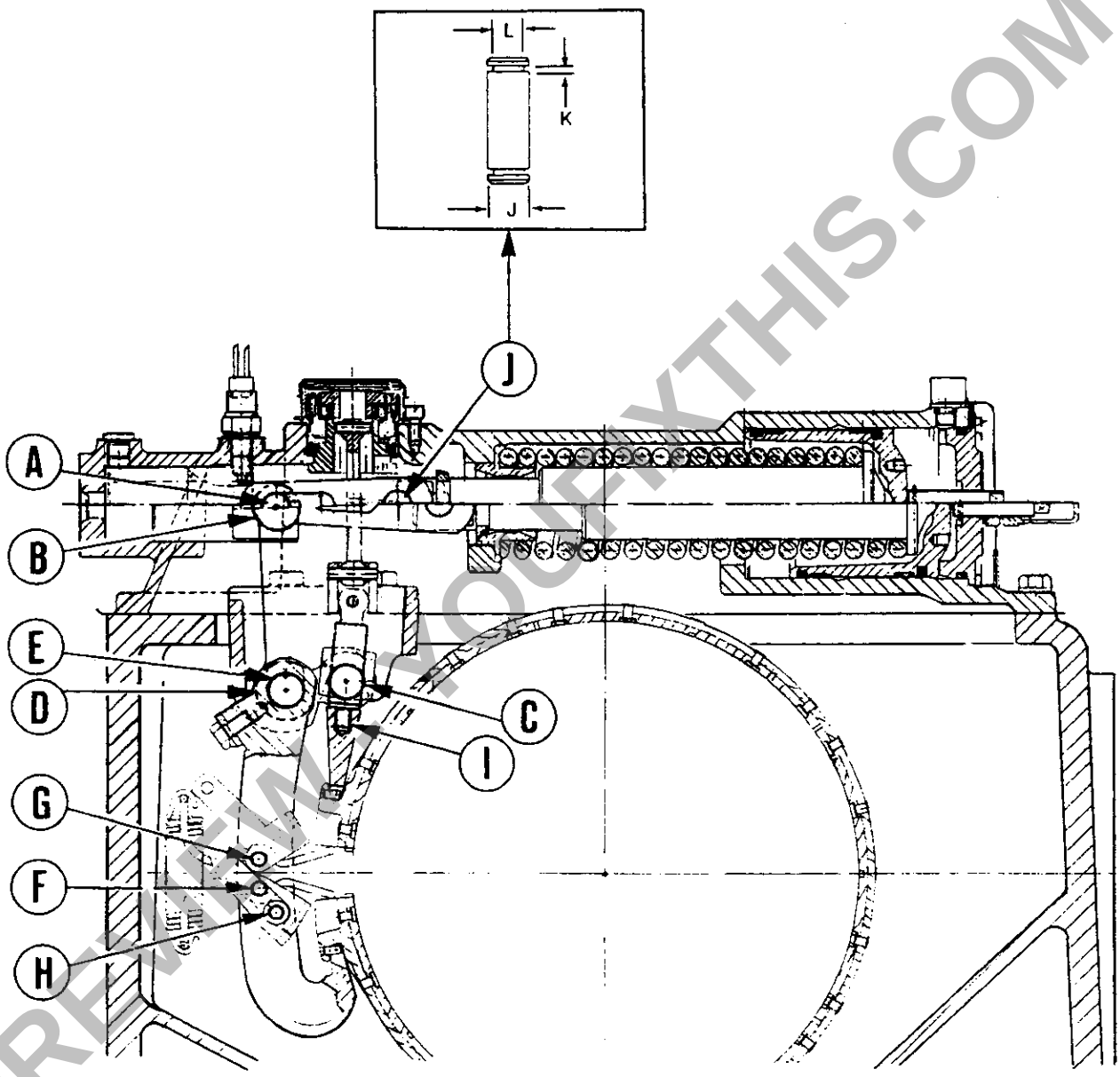
1.4.1.1.4

Disconnect vent hose from flywheel housing from vent.

Study SAFETY RULES in the front of this manual thoroughly for the protection of machine and safety of personnel.

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4.6 SPECIFICATIONS



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Observe and know the mechanics of alternate exit routes. For your personal protection, do not attempt to climb on or off machine while machine is in motion.

Be sure exposed personnel in the area of operation are clear of the unit before moving the machine or its attachments. Sound horn. Obey flagman, safety signals and signs.

When backing, always look to where the machine is to be moved. Be alert to the position of exposed personnel. **Do not operate** if exposed personnel enter the immediate work area.

Maintain a safe distance from other machines. Provide sufficient clearance for ground and visibility conditions. Yield right-of-way to loaded machines.

Maintain clear vision of all areas of travel or work. Keep cab windows clean and repaired.

When pulling or towing through a cable or chain, do not start suddenly at full throttle. Take up slack carefully. Guard against kinking chains or cables. Inspect carefully for flaws before using. Do not pull through a kinked chain or cable due to the abnormal high stresses and possibility of failure of the kinked area. Always wear heavy gloves when handling chain or cable.

Be sure cables are anchored securely and the anchor point is strong enough to handle the expected load. Keep exposed personnel clear of anchor point and cable or chain. **Do not pull or tow unless operators compartments of machines involved are guarded against potential cable or chain backlash.**

Be alert to soft ground conditions close to newly constructed walls. The fill material and weight of machine may cause the wall to collapse under the machine.

In darkness, check area of operation carefully before moving in with machine. Use all lights provided. Do not move into areas of restricted visibility.

If engine has a tendency to stall for any reason under load or idle, report this for adjustment to a proper maintenance authority immediately. Do not continue to operate machine until condition has been corrected.

Be sure to periodically check all engine exhaust parts for leaks as exhaust gases are dangerous to the operator.

An operator must know the machine's capabilities. When working on slopes or near dropoffs be alert and avoid loose or soft conditions that could cause sudden tipping or loss of control.

Where noise exposure exceeds 90 dBA for 8 hours, wear authorized ear protective equipment per local and other national safety requirements that apply.

Do not operate machinery in a condition of extreme fatigue or illness. Be especially careful towards the end of the shift.

When demountable counterweights have been provided, do not work machine if they have been removed.

When operating machine know what clearances will be encountered; overhead doors, wires, pipes, aisles, roadways; also weight limitation of ground, floors, and ramps. Be aware of fog, smoke or dust elements that obscure visibility.

Always check work area for dangerous features. The following are examples of dangerous work areas: slopes, overhangs, timber, demolitions, fire, high walls, dropoffs, backfills, rough terrain, ditches, excavations, traffic, parking lots, crowded maintenance and closed areas. Use extreme care when in areas such these.

Avoid going over obstacles such as rough terrain, rocks, logs, curbs, ditches, ridges and railroad tracks whenever possible. When obstructions must be crossed, do so with extreme care and perpendicularly. Reduce speed. Ease up to the breakover point - pass the balance point slowly on the obstruction and ease down on the other side, using attachment as an aid if necessary.

Cross gullies or ditches at an angle (possibly using attachment as an aid) with reduced speed after insuring ground conditions will permit a safe traverse.

The grade of slope you should attempt will be limited by such factors as condition of the ground, load being handled, the type of machine, speed of machine and visibility. There is no substitute for good judgement when working on slopes.

Avoid operating equipment too close to an overhang or highwall either above or below the machine. Be on the lookout for caving edges, falling objects and slides. Beware of concealment by brush and undergrowth of these dangers.

Avoid brushpiles, logs or rocks. **Do not drive the machine onto brushpiles, logs, large rocks** or other surface irregularities that break traction with the ground especially when on slopes or near dropoffs.

Be alert to avoid changes in traction conditon that could cause loss of control. Work the machine with extreme caution on ice or frozen ground conditions, on steep slopes or near dropoffs.

Operating in virgin rough terrain that includes previously mentioned hazards is called pioneering. Be sure you know how this is done. Danger from falling branches and upturning roots is acute in these areas.

Place the machine in relationship between the excavation and the dump area to swing to the left for discharge of material, for best visibility. **Never use the bucket or attachment as a man lift or allow riders on the machine.**

No machine should ever be used as a work platform or scaffolding. Other uses that depart from machine design intended purposes (such as pushing or towing rail wagons, trucks or other machines) should be avoided.

Always be aware of presence of people in the work site.

Never swing or position bucket, load or attachment over ground crew or truck cab.

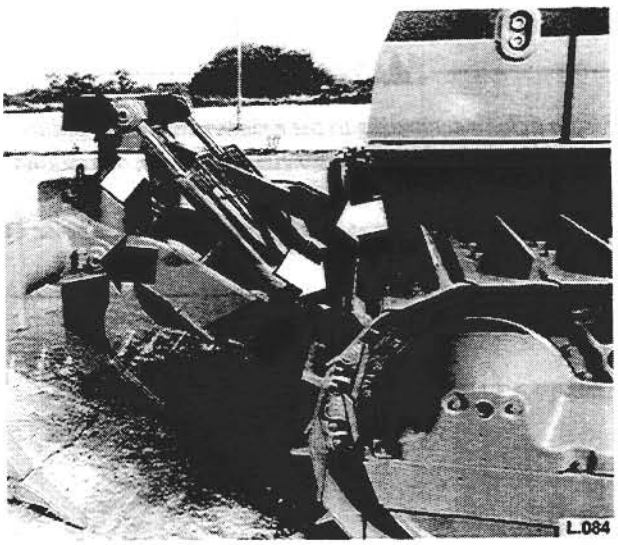
Before loading a truck be sure the driver is in a safe place.

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10. RIPPER LINKAGE - Lubricate

Inject grease into the ripper linkage fittings for ripper control. Those shown with white arrows are on the opposite side.



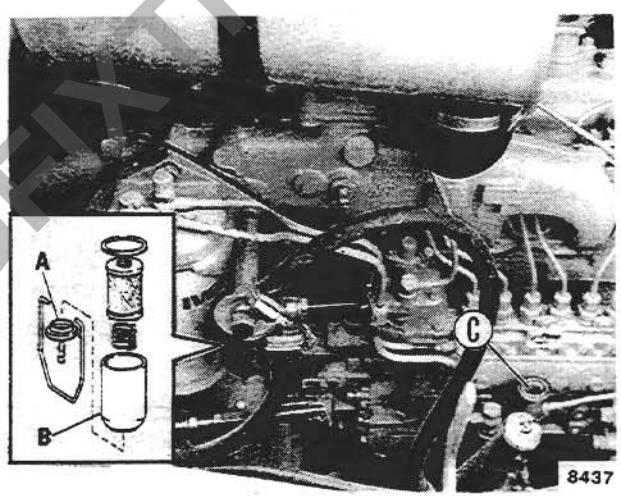
EVERY 250 HOURS

11. FUEL PUMP FILTER - Clean

WARNING

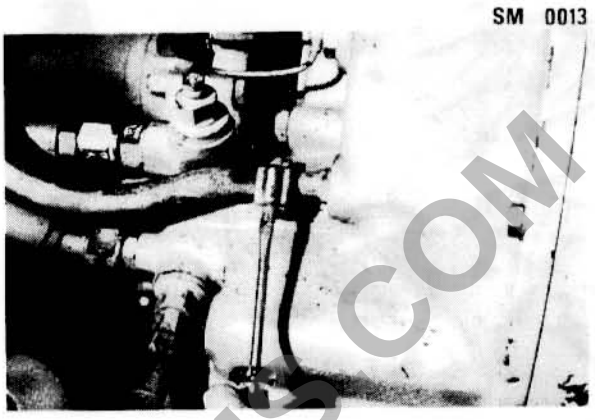
Never use gasoline, solvents or other inflammable fluids to clean parts. Use approved commercial solvents which are non-flammable and atoxic.

Unscrew ring nut **A**, remove the strainer in bowl **B** and clean it.
After having replaced the filter and bowl, operate priming knob **C** a few times.

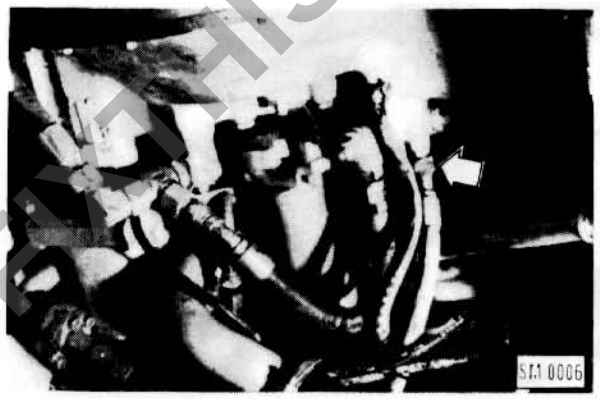


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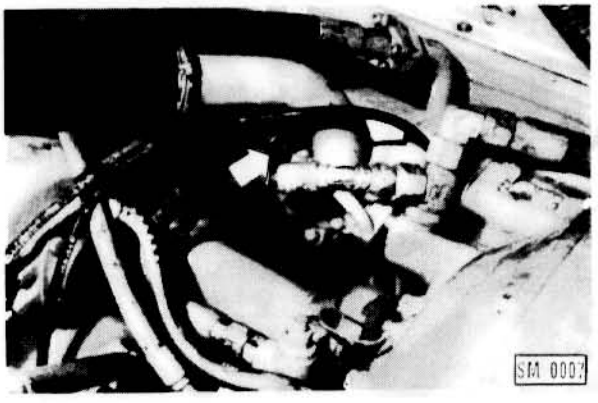
1.4.1.1.29
Disconnect vent hose between gearbox and converter.



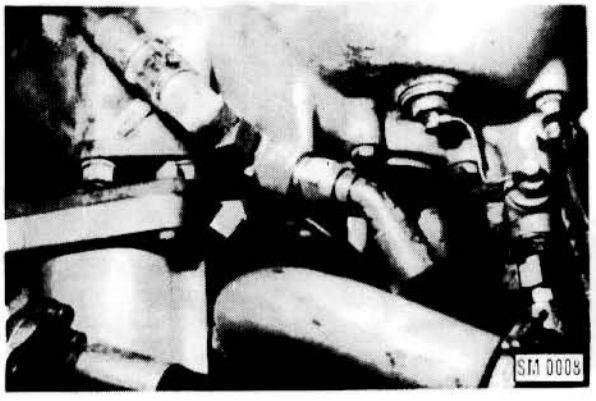
1.4.1.1.30
Disconnect hose between main pressure adjustment valve on the torque converter and the idle locking valve.



1.4.1.1.31
Disconnect the brake pump line to steering and brake control distributor.



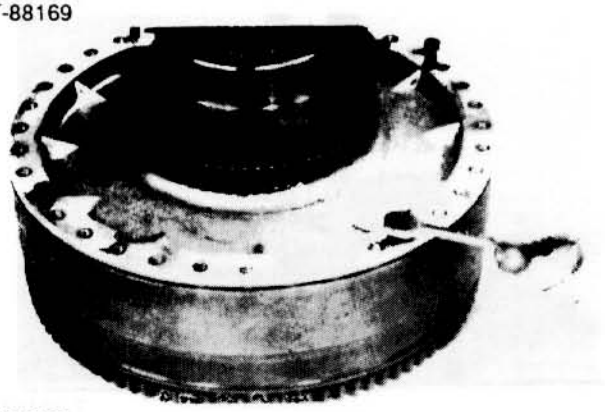
1.4.1.1.32
Disconnect lubrication oil pressure line from converter.



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T-88169

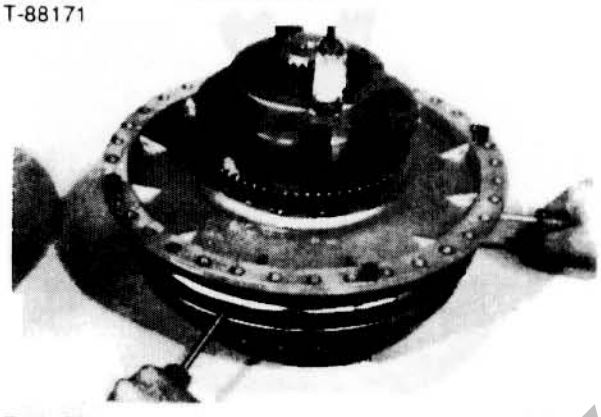


2.4.1.3.25
Using pusher screws, separate the turbine assembly from housing; lift turbine assembly from housing.

⚠ WARNING

Lift and handle all heavy parts with a lifting device of proper capacity. Be sure parts are supported by proper slings and hooks. Use lifting eyes if provided.

T-88171



2.4.1.3.26
Pry the turbine from the shaft if the turbine wheel comes with the shaft.

T-88173



2.4.1.3.27
If turbine wheel did not come with shaft, lift it from housing.

T-88174



2.4.1.3.28
Remove thrust plate from housing.

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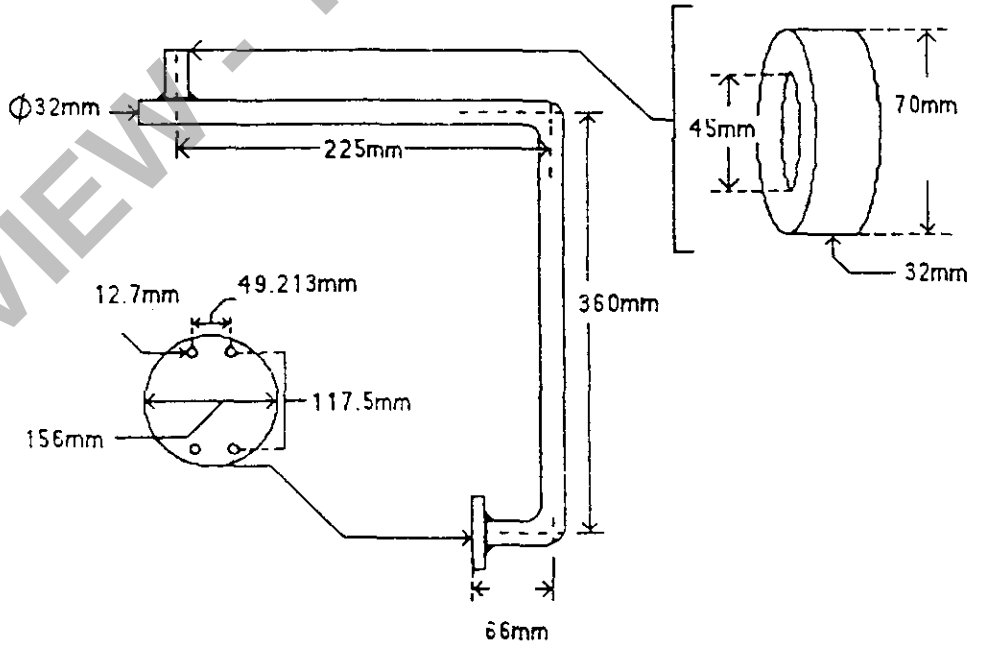
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2.5 TOOLS

Step no.	Part no.	Name
2.4.2.1.16	75292914	Chain hoist
2.4.2.3.33	75291531	Clutch clamp
2.4.2.3.60.15	75291532	Clutch pack alignment tool

Tools that can be made to assist in rebuild of components.

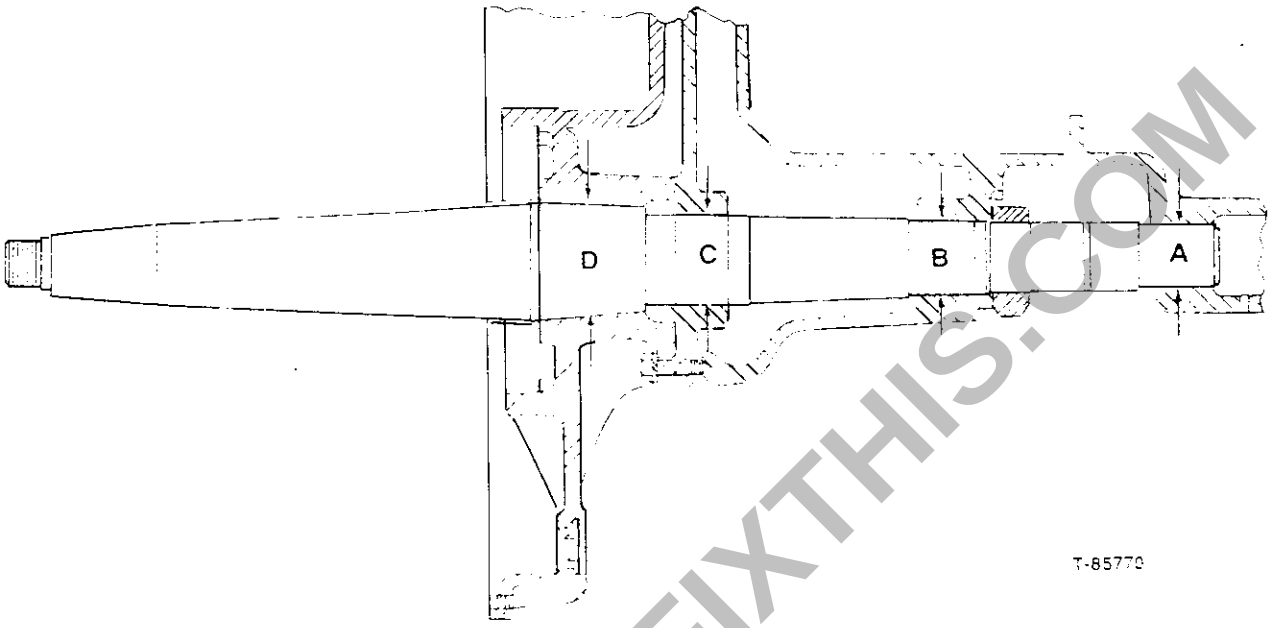
2.4.1.1.16 Converter lifting tool



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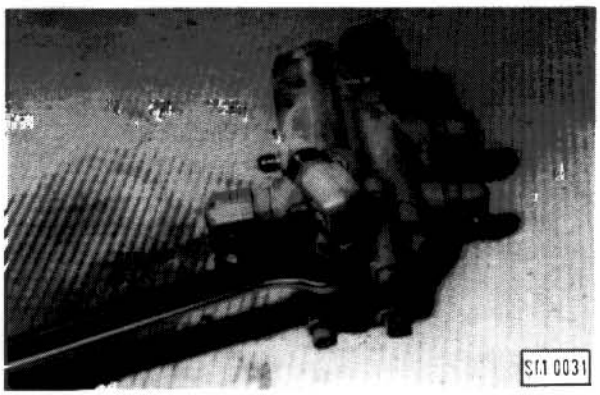
3.6 SPECIFICATIONS



3.6.3.3 SUSPENSION SHAFT	**millimeters**	**inches**
A. Bore I.D. in main housing for shaft at "A"	55.000 ÷ 55.030	
Suspension shaft O.D. at "A"	54.954 ÷ 55.000	
Clearance	0 ÷ .076	0 ÷ .003
B. Bore I.D. in main housing for shaft at "B"	65.988 ÷ 66.018	
Suspension shaft O.D. at "B"	65.954 ÷ 66.000	
Interference fit	.064 loose ÷ .012 tight	.0026 loose ÷ .0005 tight
C. Bore I.D. in main housing for shaft at "C"	77.987 ÷ 78.022	
Suspension shaft O.D. at "C"	77.954 ÷ 78.000	
Interference fit	.076 loose ÷ .013 tight	.003 loose ÷ .0006 tight
D. Bore I.D. in intermediate housing for shaft at "D"	104.955 ÷ 104.990	
Suspension shaft O.D. at "D"	104.965 ÷ 105.000	
Interference fit	.035 loose ÷ .045 tight	

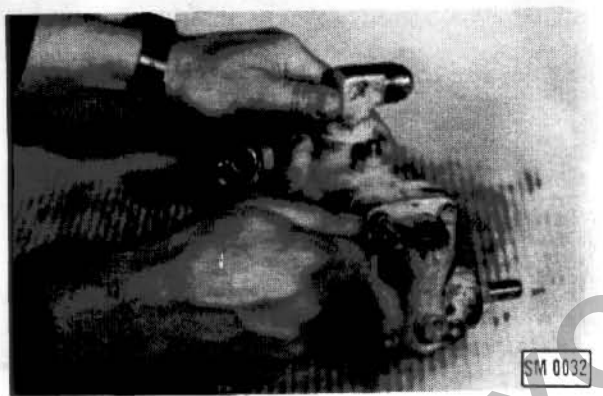
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4.4.4.2 DISASSEMBLY

4.4.4.2.1
Remove all connectors, tees, elbows and washers from the housing.



4.4.4.2.2
Remove four allen head screws and lockwashers from cover.



4.4.4.2.3
Remove cover.

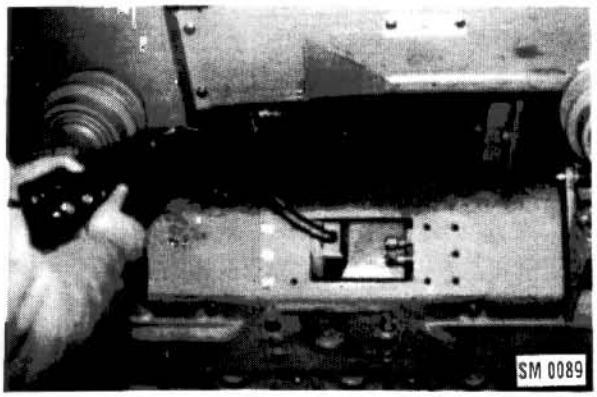
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SYMPTOM	PROBABLE CAUSE	TOOLS REQUIRED	TEST	SOLUTION
Pump noise after 15 minutes of operation	Low oil level	Operation and Maintenance Instruction Manual		Fill implement tank to proper level with specified oil
	Suction sceen clogged		Conduct flow test	Test shows inlet restriction clean suction screen
	Pump inlet leakage		Look for oil on ground or transfer to the transmission	Correct failed seal or tighten fitting
	Oil too viscous	Operation and Maintenance Instruction Manual		Fill implement tank to proper level with the specified oil
	Leakage past pump drive seals			Replace seals
Implement will not operate	Main pump failure			Replace pump
Implement will not operate in one direction	Control valve failure		Conduct flow test	Rebuild or replace valve
	Circuit relief valve stuck open		Conduct flow test	Clean or replace valve
(Dozer only)	Quick drop valve plunger stuck open			Clean or replace valve
(Dozer & Tilt)	Limit travel valves stuck open		Conduct flow test	Repair limit travel valves
Implement fails to remain in selected position	Circuit relief valve in the applicable position open		Conduct flow test	If valve fails test, clean or replace valve
	Excessive valve spool leakage		Conduct flow test	Replacement of circuit relief valve did not help, replace valve
	Cylinder piston packing leakage		Conduct flow test	Cylinder fails in test, replace packing
	Air within the cylinder		Conduct aeration test	Bleed air from cylinder
	Low oil level	Operation and Maintenance Instruction Manual		Fill implement tank to proper level with the specified oil

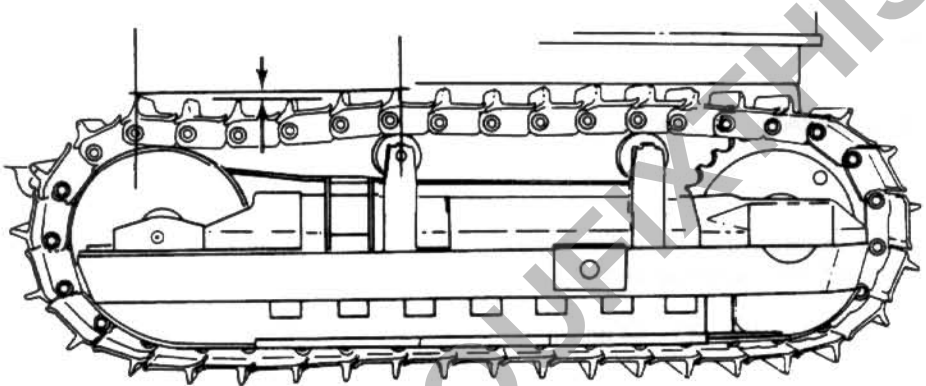
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6.4.1.3.3
Adjust track tension by means of grease into the adjusting valve connection.

6.4.1.3.4
Move machine back and forth several times. Go forward a short distance, then measure sag between idler and carriel roller: it must be 30 - 40 mm.
Adjust sag to specifications.



6.4.1.3.5
To loosen tension unscrew by a half turn the adjusting valve (B) and let grease out. To improve outlet, move machine with a tree block inserted between driving wheel and chain, or lift track with a hoist. Fasten valve again.

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ELECTRICAL SYSTEM WIRING DIAGRAM

1 Current connection for outside start
2 Batteries
3 Main switch
4 Start motor
5 Motor start commutator
6 Start remote switch
7 Fuel enricher coil
8 Cold starting control
9 Cold starting solenoid valve
10 Electromagnet for motor stop
11 Fuse 7.5 A.
12 Dome light with orientable light beam
13 Connection for portable lamp and cigar lighter
14 Impulse generator
15 Electronic revolution counter
16 Head light, front right
17 Head light, front left
18 Fuse 7.5 A.
19 Switch for cabin front head lights
20 Fuse 7.5 A.
21 Cabin head light, front right
22 Cabin head light, front left
23 Switch for cabin rear lights
24 Fuse 7.5 A.
25 Pilot lamp: rear lights ON (with 23)
26 Cabin head light, rear right
27 Cabin head light, rear left
28 Light commutator
29 Fuse 7.5 A.
30 Horn
31 Pressure switch for reverse gear horn
32 Reverse gear horn
33 Pushbutton: side window washer
34 Electro pump: side window washer
35 Electro pump: front/rear window washer
36 Fuse 7.5 A.
37 Commutator: side window wiper right/left (two speeds)
38 Drive reducer: left hand window wiper
39 Fuse 7.5 A.
40 Derivation box
41 Drive reducer: right hand window wiper
42 Fuse 7.5 A.
43 Pushbutton: window washer front/rear
44 Drive reducer: front window wiper (one speed)
45 Fuse 7.5 A.
46 Commutator: side window wiper front/rear
47 Drive reducer: rear window wiper (one speed)
48 Fuse 20 A.
49 Pushbutton for horn
50 Radio
51 Alternator (with voltage control)
52 Fuse 4 A.
53 Right switch: brake trouble
54 Left switch: brake trouble
55 Pilot lamp: brake trouble
56 Sensor: high temperature of motor coolant
57 Sensor: air filter clogged
58 Sensor: hydraulic oil filter clogged
59 Sensor: high temperature of gearbox oil
60 Hour counter
61 Sensor: low temperature of motor oil
62 Sensor: fuel level
63 Sensor: motor coolant level
64 Sensor: motor oil level
66 Sensor: gearbox oil level
67 Sensor: gearbox oil low pressure
68 Buzzer
69 Electronic Data Monitor
75 Electroventilator
76 Conditioner thermostate
77 Pressure switch
78 Compressor electromagnetic clutch
79 Remote switch
80 Conditioner electroventilators
81 Instrument panel lighting
82 Fuse 20 A (electrofan).
84 Commutator for motor start "from the ground"
85 Service remove switch
86 Diode box
87 Cabin service remote switch
88 "Link" fuse 50 A.
89 Sensor for starting safety
92 "Link" fuse 50 A.
93 Starting safety remove switch
94 Commutator fo cab electroventilator
95 Conditioner switch

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Study SAFETY RULES in the front of this manual thoroughly for the protection of machine and safety of personnel.

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