Allis Chalmers

Service Manual

940 Arliculated Wheel Loader

Service® Manual

AC-S-940 W/L

ALLIS-CHALMERS

INDUSTRIAL SERVICE MANUAL

940 ARTICULATED WHEEL LOADER

WHEEL LOADER

INDUSTRIAL TRACTOR DIVISION
LITHO IN USA
BOX 521 TOPEKA, KANSAS 66601
FORM NO. ISM 20

TAB SECTION

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DIESEL ENGINE

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Specifications

ENGINE DATA AND CHARACTERISTICS

Make	Allis-Chalmers
Model	2900 Mark II
Type–Vertical In-Line, Compression Ignition, Water Cooled, Four Cycle, Direct Injection, Open Combustion Chamber	Full Diesel
Number of Cylinders	6
Bore	3.875" (98,42mm)
Stroke	4.250" (107,95mm)
Final Displacement	301 cu. in. (4933cm³)
Crankshaft Rotation (Viewed from Fan End)	Clockwise
Number of Main Bearings	7
Compression Ratio (Nominal)	16.25:1
Compression Pressure (Minimum) at Sea Level 600 rpm hot	500 PSI (35,15 kg/cm²)
Firing Order	1-5-3-6-2-4
Minimum Stabilized Water Temperature	180 Degree F. (82 Degree C.)
Maximum Permissible Exhaust Restriction	2" Hg (50,8mm)
High Idle	2650–2700
Low Idle	700–800
Rated Load & Speed	95 BHP @ 2500 RPM
Static Timing (with Fuel Injection Pump DBGFC637–62FW)	24 Degree BTDC
Static Timing (with Fuel Injection Pump No. DBGFC637–17JT)	18 Degree BTDC
Intake Manifold Pressure	32"Hg. @ 2500 RPM
(At Full Throttle and Engine	30.2"Hg. @ 2400 RPM
Operating On Torque Curve)	25.7"Hg. @ 2200 RPM
	21.3"Hg. @ 2000 RPM
	16.2"Hg. @ 1600 RPM
Converter Stall	2400–2500 RPM
Converter & Loader Hydraulic Stall	1680 RPM Minimum
(Engine, Torque Converter and Hydraulic Oils to be at Normal Operating Temperature)	

FUEL INJECTION

Nozzle Type	Spring Loaded, Four Hole Orifices
Opening Pressure	3450–3500 PSI (242–246 kg/cm²)
Orifice Size	0,32mm (0.0126")
Fuel Pump Timing to Engine (with Fuel Injection Pump DBGFC637–62FW)	24 Degree BTDC
Fuel Pump Timing to Engine (with Fuel Injection Pump No. DBGFC637–17JT)	18 Degree BTDC
Fuel Injection Pump Speed (Ratio to Crankshaft)	.5:1

VALVE DATA AND TIMING

Valve Lash Adjustment:

Intake Valve Clearance	.015" (0,381mm) Hot; .018" (0,457mm) Cold
Exhaust Valve Clearance	.015" (0,381mm) Hot; .018" (0,457mm) Cold

Valve Timing:

Exhaust Valve (with .0195" - 0,495mm tappet clearance):

Opens BBDC	56 Degree
Closes ATDC	16 Degree
Duration	252 Degree

Intake Valve (with .0195" - 0.495mm tappet clearance):

Open BTDC	20 Degree
Closes ABDC	48 Degree
Duration	248 Degree
Overlap	36 Degree

FLYWHEEL HOUSING AND CRANKSHAFT REAR OIL SEAL

GENERAL

The flywheel housing, a one piece casting ribbed for strength, is positioned on the rear of the cylinder block on two dowel pins, and is secured in place with self-locking capscrews.

The spring-loaded, lip type oil seal is pressed into the flywheel housing.

The only time the housing requires services or replacement is when it is cracked or damaged.

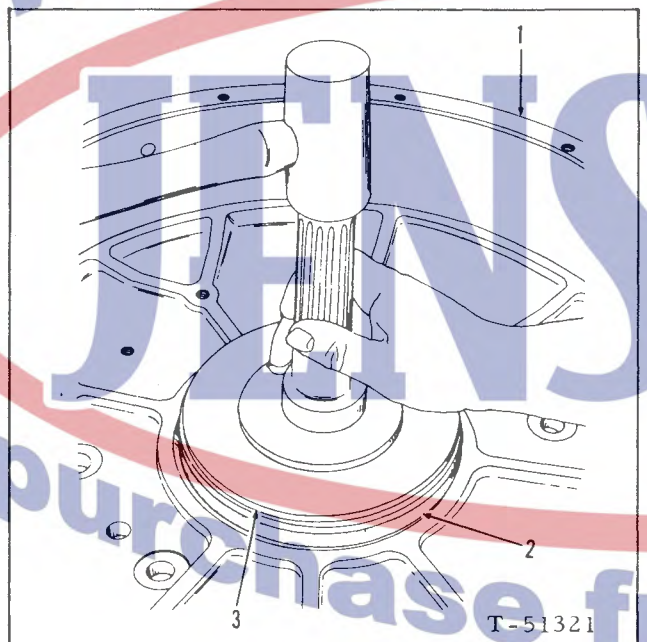


FIG. 7 INSTALLING CRANKSHAFT REAR OIL SEAL

1. Flywheel housing
2. Oil seal
3. Seal installer

FLYWHEEL HOUSING REMOVAL AND INSPECTION

Remove the engine.

Remove the flywheel.

Remove the four capscrews and lockwashers securing the engine oil pan to the flywheel housing.

Remove the seven self-locking capscrews securing flywheel housing to the cylinder block; tap housing with a softheaded hammer to break it loose from the housing dowels and remove the housing.

Thoroughly clean housing with cleaning solvent. Remove flywheel housing-to-block O-ring and the flywheel housing-to-camshaft O-ring from the housing.

Inspect housing for cracks and other damage; repair or replace housing if damaged.

Remove and discard the crankshaft rear oil seal; thoroughly clean the bore from which the seal was removed.

FLYWHEEL HOUSING INSTALLATION

Thoroughly clean rear of cylinder block.

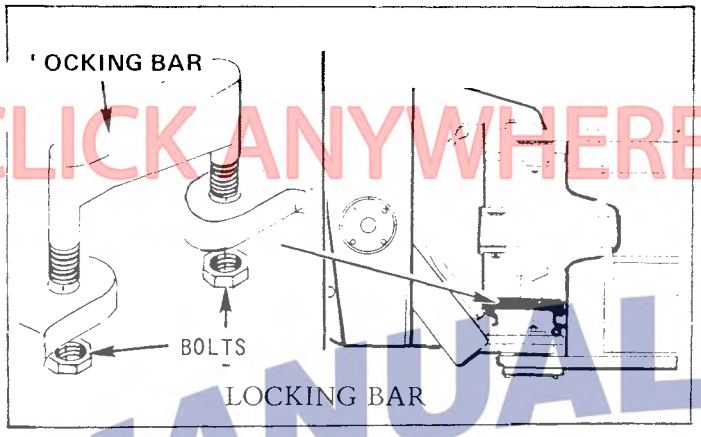
Position seal squarely with bore in housing; use a seal installer, Fig. 8, to drive seal into flywheel housing until flush with cylinder block side of the housing -- the seal lip must be toward the cylinder block side of housing.

NOTE: The O. D. of the seal has a layer of red-colored sealant which eliminates the use of a sealing compound on the O. D. of the seal prior to driving it into the flywheel housing.

Make certain the crankshaft flange on which the seal rides is free from nicks or burrs. Polish with crocus cloth if necessary.

Lubricate flange and sealing lip with clean engine oil. Do not use grease, soap, white lead, etc.

FIG. 8 CRANKSHAFT REAR OIL SEAL REMOVAL AND INSTALLATION TOOL SET



LOCKING BAR

CAUTION: When making transmission and torque converter oil level check, always place locking bar as shown in position, securing front and rear section together, so that no articulation movement may be made accidentally.

R.H. VIEW OF SERVICE AREA TO TRANSMISSION

TRANSMISSION AND TORQUE CONVERTER OIL LEVEL (Symbol TF)

Check oil level in transmission after every 10 hours of operation. Before starting the engine, check the oil level of the transmission with the dipstick. The oil level should be at the "FULL STOP COLD" mark. This is a sufficient amount of oil to start the engine and warm the transmission up for the hot check.

Located on the right side of the transmission, is the dipstick and fill point, which is accessible by removing the R.H. service panel.

HOT CHECK

1. This should be done with oil temperatures of 180 to 200 degrees F. To bring the oil temperature to this specification, it is necessary to either work the machine or "stall" out the converter.

2. Where the former means is impractical the latter means should be employed. Engage shift lever in forward and high speed and apply brakes. Accelerate engine half to three-quarter throttle. Hold stall until desired converter temperature is reached.

3. CAUTION: Full throttle stall speeds for an excessive length of time will overheat the converter.

4. Locate the wheel loader on level ground. Place the transmission controls in "Neutral" and apply the hand brake. Lower the bucket to the ground as an additional safety precaution.

CAUTION: Always check and make sure the hand brake has been applied , the transmission in Neutral and the loader bucket lowered to the ground before performing the oil level check.

5. The wheel loader engine must be idling while performing the oil level check.

6. Check the oil level of the transmission with the dipstick. The oil level with the

ENGINE RUNNING AT IDLE AND TRANSMISSION IN NEUTRAL should be between the FULL and ADD mark on the dipstick.

If oil level is not between ranges described above (depending on the type of check being made) it will be necessary to add or subtract oil. Oil level capacity is approximately 5 gal. (symbol TF). **Dexron ®** Automatic Transmission Fluid identification number (B-10100) is specified for use.

NOTE: The oil filter element is to be changed after the first 50 hours of operation and after the first 50 hours of operation following an overhaul or repair and each 250 hours thereafter. In addition, the element should be changed each time the oil is drained.