ENGINE SPECIFICATIONS

GENERAL

Make and Model	Case 504BDT
Type	.6 cylinder, 4 stroke cycle, valve-in-lead turbo charged
Horsepower	
Maximum Gross (See Note 1)	165 H.P. @ 2200 RPM
*SAE net flywheel (See Note 2)	150 H.P. @ 2200 RPM
Bore and Stroke	4-5/8" (117.5 mm) x 5" (127 mm)
Piston Displacement	504 cubic inches (8.26 liters)
Firing Order	1-5-3-6-2-4
Compression Ratio	15.8 to 1
Engine Speeds	
No load governed speed	2330-2370 RPM
Full load rated	2200 RPM
Engine idling speed	750-800 RPM
Exhaust Valve Rotators	Positive Type
Torque, Pounds-Feet, SAE	445 @ 1500 RPM
*Valve Tappet Clearance (Exhaust) (Hot)	.020" (0.508 mm)
(Cold)	.025" (0.635 mm)
(Intake) (Hot & Cold)	.015" (0.381 mm)

*Hot Settings are made after the engine has operated at thermostat controlled temperatures

PISTON AND CONNECTING RODS

Rings per piston	3
Number of Compression rings	2
Number of Oil rings	1
Type Pins	Full floating type
Type Bearing	Replaceable Precision, Steel back, Copper-Lead or Aluminum Alloy Liners

MAIN BEARINGS

Number of Bearings	7
Type of Bearings	Replaceable Precision Steel back, Copper-Lead or Aluminum Alloy Liners

ENGINE LUBRICATING SYSTEM

Crankcase Capacity (W/O Filter Change)	15 Quarts
With Filter Change	17 Quarts
Oil Pressure	45 to 60 PSI with Engine Warm and Operating at Rated Engine Speed
Type System	Pressure and Spray Circulation
Oil Pump	Gear Type
Oil Filter	Full Flow Spin on Type

FUEL SYSTEM

Pump Timing	.30° BTC Static
Recommended Fuel	No. 2 Diesel
Fuel Pressure @ Injection Pump	25 PSI (1.75 Kg/cm^2)
Nozzel Opening Pressure	3150 to 3250 PSI
Fuel Tank	75 gals (283.87L)
Radiator Pressure Cap	7 P.S.I.(.49 Kg/cm^2)
Engine Oil Pressure	45 to 60 PSI (3.16 kg/cm2 to 3.87 Kgs/cm^2)

NOTE1

Manufacturer's rating of maximum engine horsepower at flywheel without accessories. Fuel set at maximum quantity for this application.

NOTE2

SAE net flywheel horsepower of engine as applied to this vehicle when equipped with all accessories.

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SCHEDULED MAINTENANCE CHART

This section contains the routine and periodic maintenance information necessary to keep your machine in top operating condition. Following the maintenance chart is the easiest and most economical means of assuring many hours of satisfactory operation.

NOTE:

Grease fittings which are exposed to severe conditions of dust, water or mud should be lubricated more often than suggested in the Maintenance Chart.

INTERVAL	SERVICE	LUBRICANT/PART
Run - in (after 20 Hours)	Replace 33 Micron Hydraulic Oil Filter Element, clean 100 Mesh Screens	Use non-flammable solvent to clean Mesh Screens
	Change Engine Oil and Oil Filters	See Chart on Page 10.
	CAUTION: When ambient temperature changes be certain to change oil as specified in Lubricants and Fluids Chart page 10.	
Every 10 hours or Daily	Grease Leveler Fittings Grease Boom Fittings	Multipurpose No. 1 Lithium "Soap Base" grease - below 32° F.
	Grease Crawler Drive Pillow Blocks	Multipurpose No. 2 Lithium "Soap Base" grease - above 32° F.
	Check Hydraulic Oil Tank Level	To check level - Crowd in Curl Tool, Bucket on Level Ground
	Track Rollers	Check for Leakage Lifetime Lubricated; no scheduled maintenance required (HDM 30W)
	Drain water from Fuel Tank	Open petcock under turntable
	Check Engine Oil Level	Level between full and fill lines on dipstick

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CHECKING ENGINE OIL LEVEL

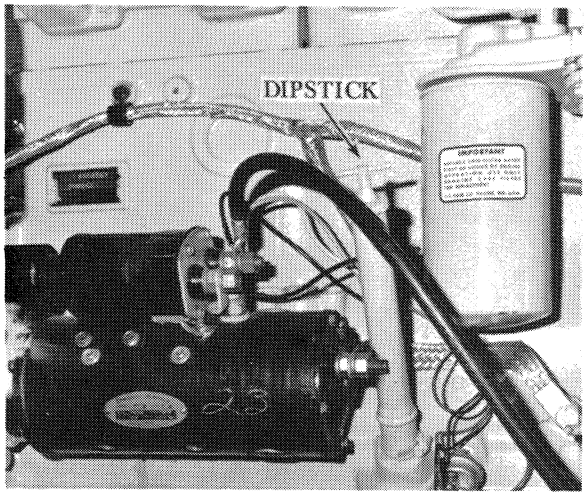
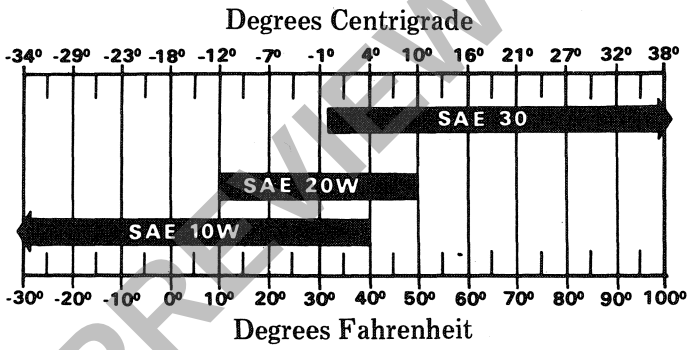


Figure 16. Location of Engine Dipstick

Check engine oil level daily, using the dipstick on the right hand side of the engine, Figure 16. To reach dipstick, open door at rear of excavator and reach inside shroud. Oil level should be between FULL and LOW marks on the dipstick. Do not check oil level when engine is running. Be sure the turntable is level before checking level of oil.

PREVAILING AIR TEMPERATURE



ENGINE LUBRICATING OIL SERVICE DESIGNATION

Use only Case HDM or SAE J183, CD and SD Service Classification Oil in the engine crankcase that has passed the required engine performance test for the MIL-L2104C Rating.

CHANGING ENGINE OIL.

Change Interval

After the first 20 hours of operation and each 100 hours or every 2 weeks, whichever occurs first. If operating conditions are severe, oil should be changed more often.

NOTE:

OIL SHOULD BE DRAINED WHILE HOT FOR THE MOST THOROUGH REMOVAL OF CONTAMINANTS.

1. Remove the oil pan drain plug and drain engine crankcase of oil.
2. After oil is drained reinstall oil pan drain plug.
3. Select a high quality oil that meets all specifications in chart on page 10 and the oil service classification mentioned earlier.
3. Refill with 15 measured U.S. quarts of oil to the crankcase.

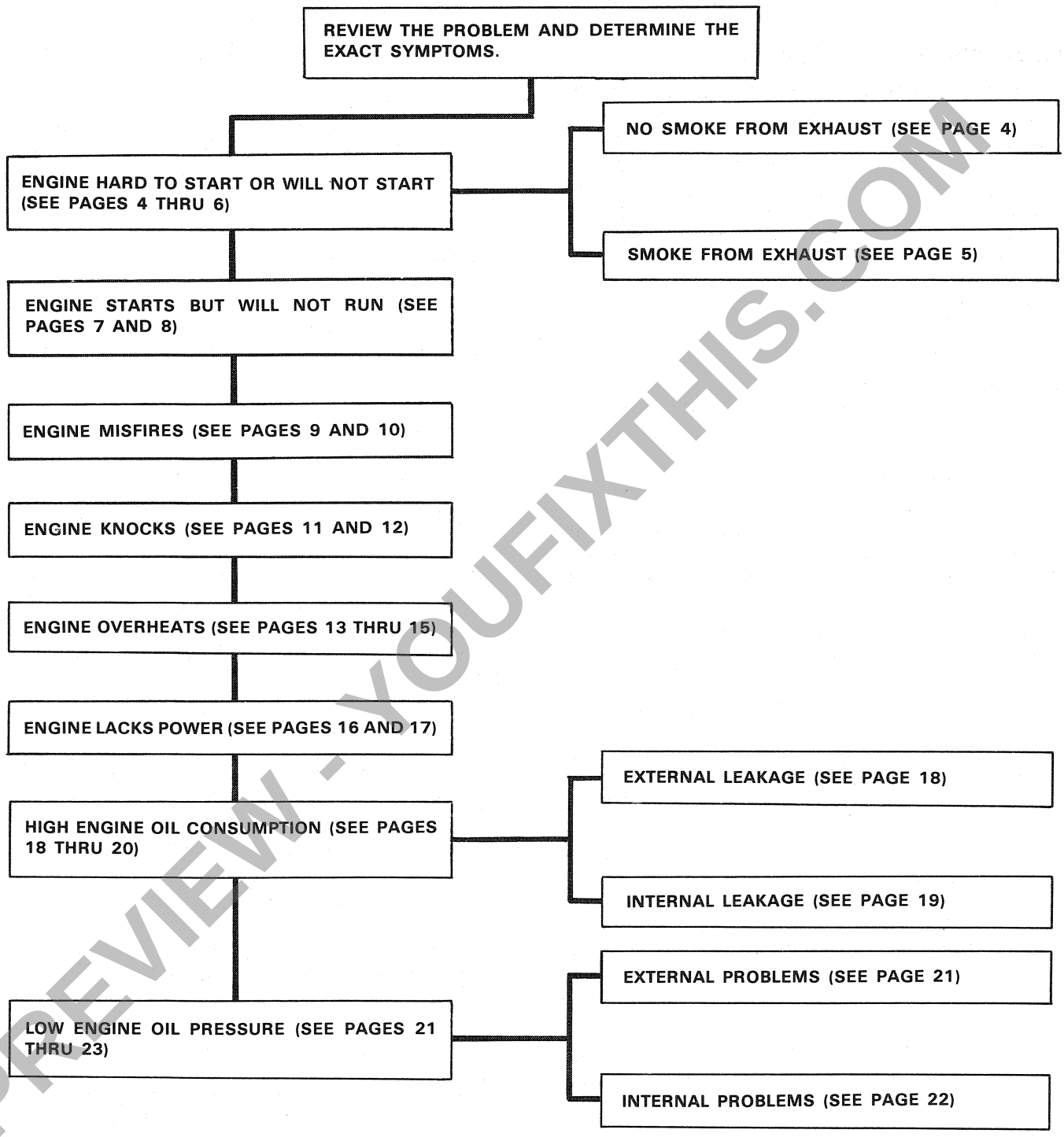
IMPORTANT: Make certain the excavator is setting on level ground to assure an accurate oil level check.

4. With the fuel shut off control pulled to the "off" position and ignition switch on, press the start button, cranking the engine until the engine oil pressure gauge pointer reaches the green zone or for a maximum of 30 seconds. Push the fuel shut off control down to the "run" position, then press the start button until engine starts and run for 5 minutes at approximately 1000 RPM. This will assure that adequate lubrication has reached the turbocharger bearings before applying full throttle or load. Shut the engine off and check oil level with dipstick. Check filter area for any oil leaks. Add oil if necessary.

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ENGINE DIAGNOSIS CHART



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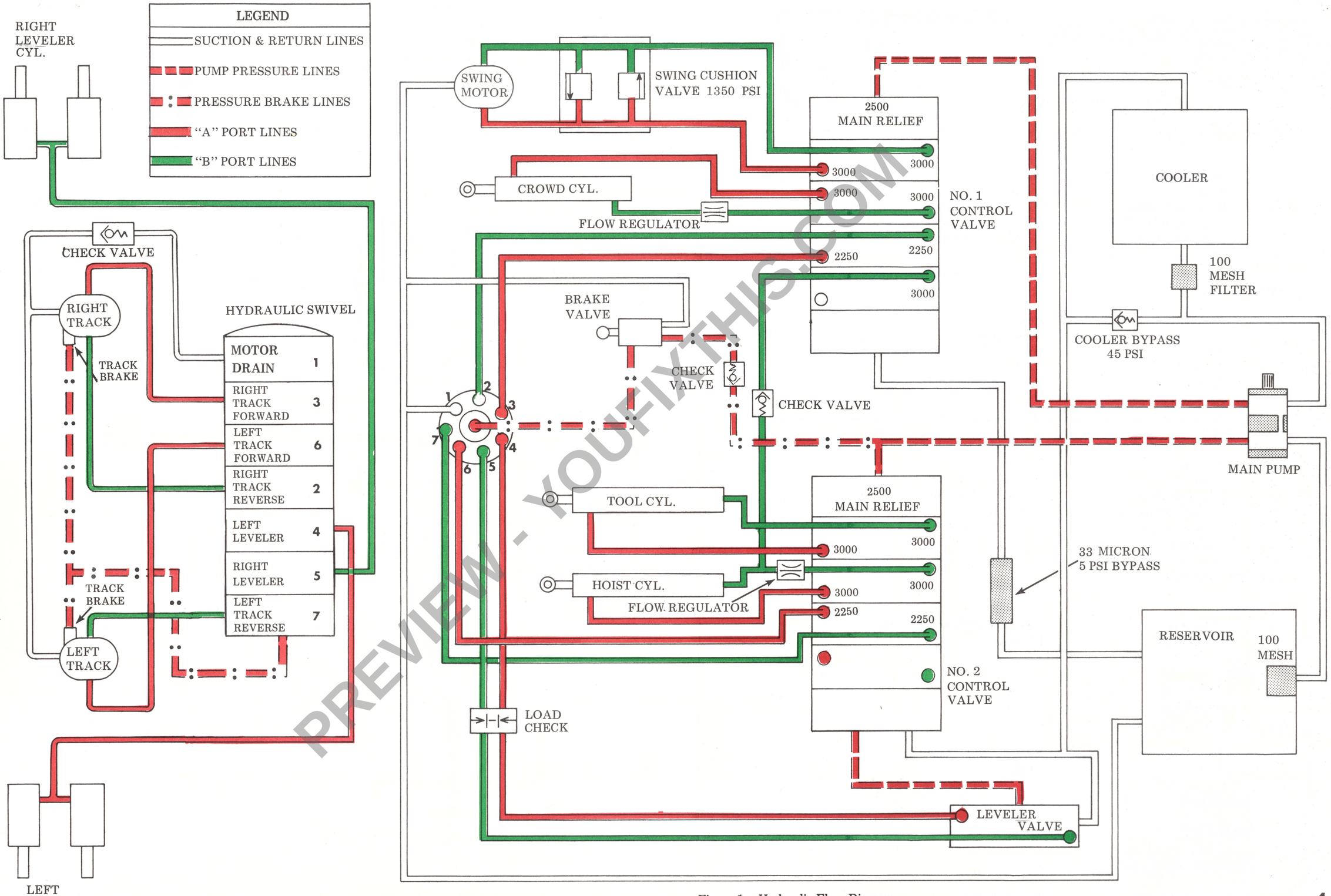
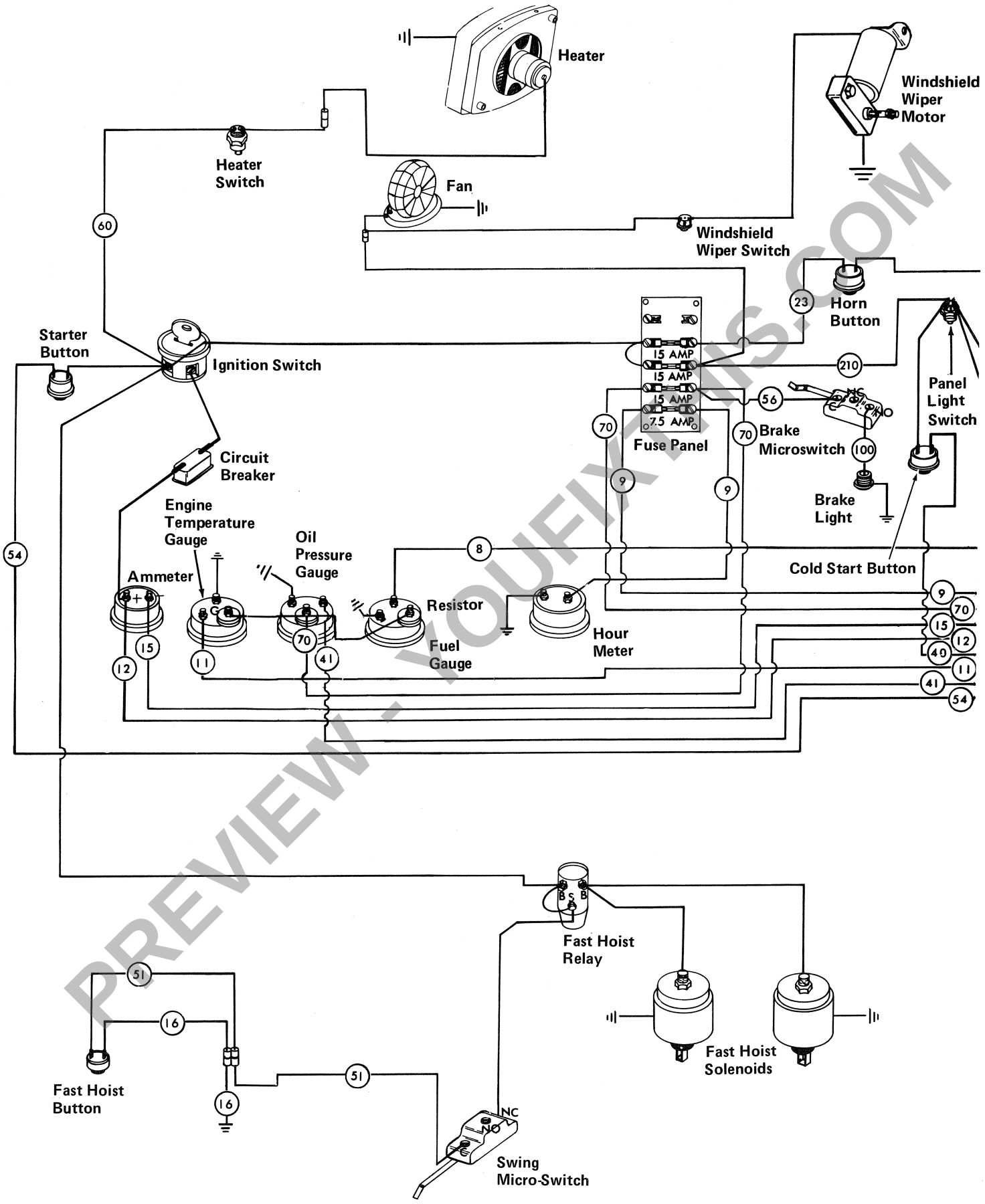


Figure 1. Hydraulic Flow Diagram

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980 EXCAVATOR

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Engine Tuneup	2002	9-76379
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Crankshaft, Main Bearings, Flywheel and Oil Seals	2035	9-76187
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SECTION
10
GENERAL INFORMATION

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DETAILED ENGINE SPECIFICATONS

Cylinder Sleeves

	Decimal System	Metric System
I.D. of sleeve including wear	4.6250 to 4.6333″	117.475 to 117.7163mm
Sleeve out of round (installed in block)	.001″	.025mm
Maximum Limit including wear	.002″	.0508mm
Taper (installed in block)	.001″	.0254mm
Maximum limit including wear	.007″	.1778mm
Clearance to bottom of piston skirt, 90^0 to piston pin including wear	.0052 to .0175″	.1321 to .445mm

Piston

Type	Cam ground	
Material	Aluminum Alloy	
O.D. at bottom of skirt, 90^0 to piston pin including wear	4.6178 to 4.6198″	117.2921 to 117.3429mm
I.D. of piston pin bore including wear	1.8001 to 1.8015″	45.7225 to 45.7581mm
Width of 3rd ring groove including wear	.188 to .191″	4.775 to 4.851mm

Piston Rings

No. 1 Compression (chrome)	Keystone	
End gap in 4.625 I.D. (117.475 I.D.) sleeve including wear	.017 to .037″	.432 to .940mm
No. 2 Compression (chrome)	Keystone	
End gap in 4.625 I.D. (117.475mm I.D.) sleeve including wear	.013 to .033″	.330 to .838mm

Oil Ring

Width	.186 to .187″	4.724 to 4.75mm
End gap in 4.625 I.D. (117.475mm I.D.) sleeve	.013 to .033″	.330 to .838mm
Side clearance including wear	.001 to .005″	.025 to .127mm

Piston Pin

Type	Full Floating	
O.D. of pin	1.7994 to 1.7996″	45.7052 to 45.7102mm
Fit in piston	.0005 to .0011″	.0127 to .0279mm
Fit in rod bushing	.0008 to .0014″	.0203 to .0356mm

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LOW ENGINE OIL PRESSURE

EXTERNAL PROBLEMS

1. External Oil Leakage

Check for oil leakage at the oil filter, external oil lines and oil cooler.

2. Oil Pressure Gauge Malfunction

Pressure gauges can malfunction and provide false readings. Test with more than one gauge to be certain the readings are correct.

3. Oil Pressure Sending Unit Malfunction

Disconnect wire from sending unit to dash gauge. Ground this wire and turn on key switch. If gauge comes up, problem is in the sending unit.

4. Oil Pressure Gauge Wiring Damaged

If the gauge wiring is grounded at the sending unit with the key on and no gauge reading, the problem lies in the gauge or wiring. Hook a jumper wire from gauge terminal to ground and turn on the key. If a reading is obtained, the problem lies in the wiring. Replace the wiring harness or run a separate wire for oil pressure gauge.

5. Bad Ground On Gauge or Sending Unit.

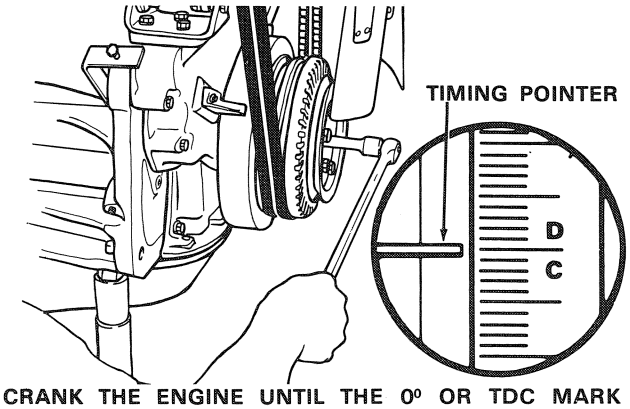
A bad ground on gauges or sending units can many times be the only problem with a malfunctioning gauge. Take a jump wire and ground gauge or sending unit to machine, then recheck gauge. Pipe tape is often used to seal threads on oil sending units which destroys the biggest share of its grounding ability.

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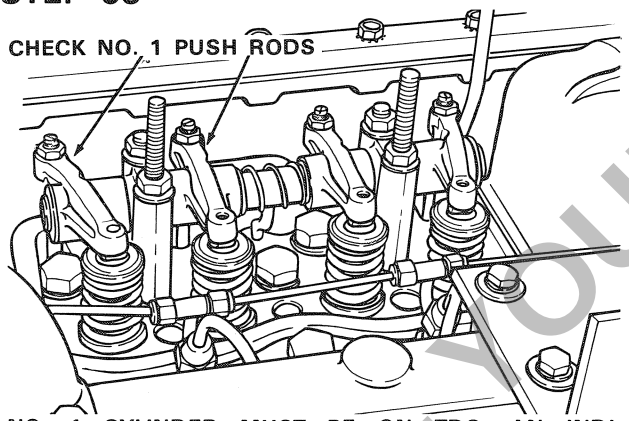
Checking Valve Timing

STEP 64



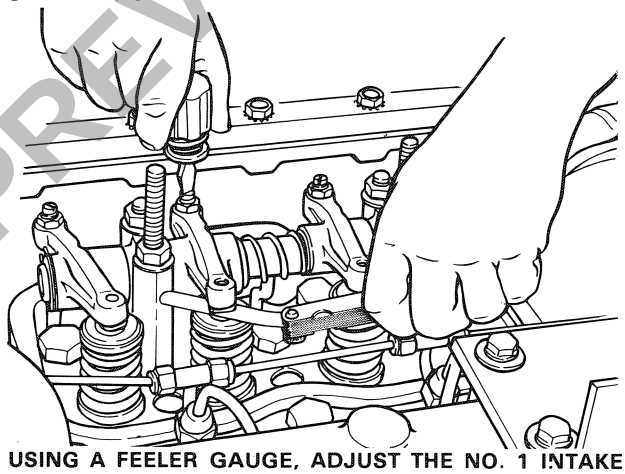
CRANK THE ENGINE UNTIL THE 0° OR TDC MARK ON THE CRANKSHAFT PULLEY IS ALIGNED WITH THE TIMING POINTER.

STEP 65



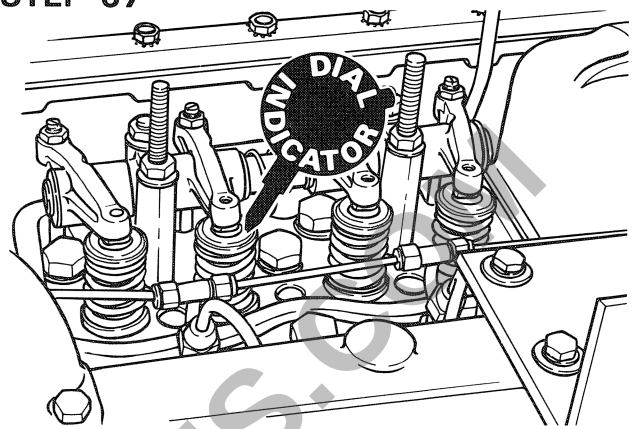
NO. 1 CYLINDER MUST BE ON TDC. AN INDICATION OF ACHIEVING TDC IS THE LOOSENESS OF THE NO. 1 INTAKE AND EXHAUST PUSH RODS (ROCKER ARMS SHOULD ROCK BACK AND FORTH). IF THE ROCKER ARMS ARE NOT LOOSE, THEN THE NO. 1 CYLINDER IS NOT AT TDC. REPEAT STEP 64 UNTIL NO. 1 CYLINDER IS AT TDC.

STEP 66



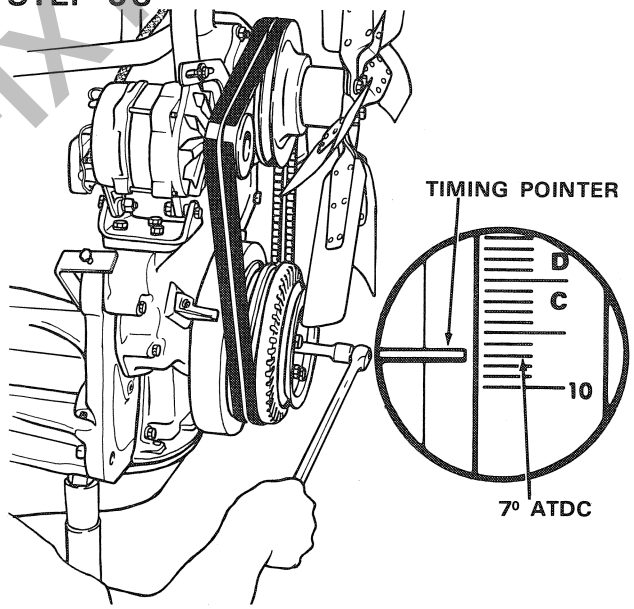
USING A FEELER GAUGE, ADJUST THE NO. 1 INTAKE VALVE TAPPET CLEARANCE AT .015" BY ADJUSTING THE ROCKER ARM ADJUSTING NUT.

STEP 67



PLACE A DIAL INDICATOR ON THE NO. 1 INTAKE VALVE RETAINER AND SET THE DIAL INDICATOR AT 0°.

STEP 68



CRANK ENGINE ONE REVOLUTION PLUS 7° ATDC. THE DIAL INDICATOR (STEP 67) SHOULD GIVE A READING OF .053". IF A READING OF .053" IS NOT OBTAINED THEN THE COMPLETE VALVE TRAIN ASSEMBLY MUST BE CHECKED.

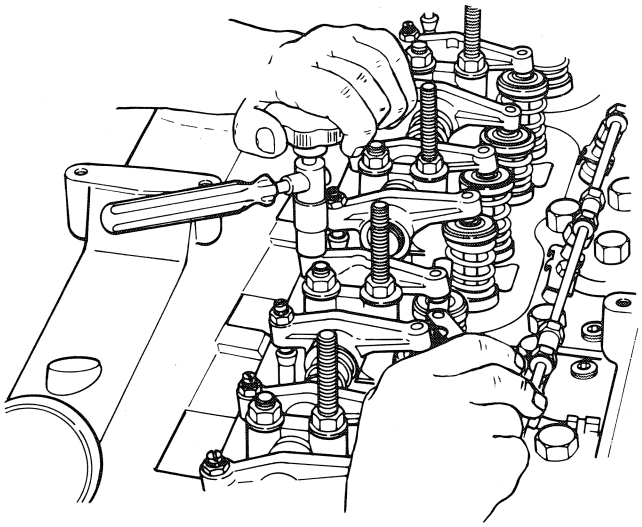
THIS PROCEDURE (STEPS 64 THRU 68) CAN BE USED TO ALSO CHECK THE PROPER ASSEMBLY OF CAM TO CRANKSHAFT GEAR TEETH WITHOUT REMOVING THE FRONT GEAR COVER.

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Valve Tappet Adjustment - Cold Setting

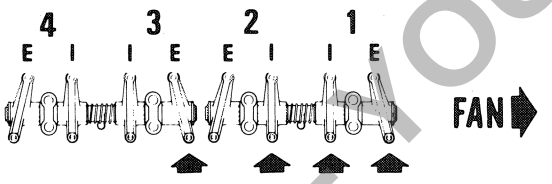
STEP 69



CHECK AND ADJUST THE INTAKE AND EXHAUST VALVES AS POINTED OUT BY THE ARROWS BELOW.

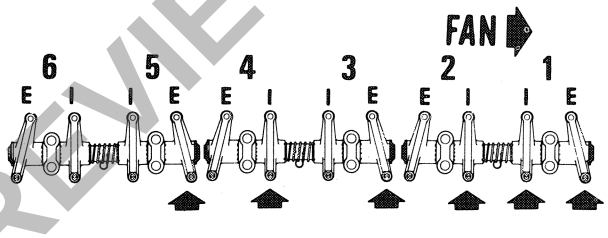
TAPPET CLEARANCE COLD - INTAKE VALVES .015"
EXHAUST VALVES - .025"

FOUR CYLINDER ENGINES



NO. 1 TDC COMPRESSION STROKE

SIX CYLINDER ENGINES



NO. 1 TDC COMPRESSION STROKE

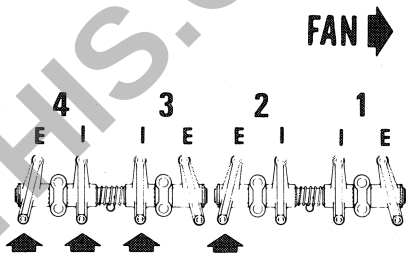
STEP 70

CRANK THE ENGINE ONE COMPLETE REVOLUTION AND ALIGN THE TIMING POINTER WITH THE TDC MARK ON CRANKSHAFT PULLEY.

CHECK AND ADJUST THE INTAKE AND EXHAUST VALVES AS POINTED OUT BY THE ARROWS BELOW.

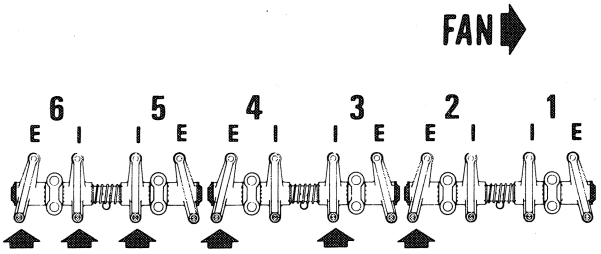
TAPPET CLEARANCE COLD - INTAKE VALVES .015"
EXHAUST VALVES .025"

FOUR CYLINDER ENGINES



NO. 4 TDC COMPRESSION STROKE

SIX CYLINDER ENGINES



NO. 6 TDC COMPRESSION STROKE

STEP 71

AFTER THE VALVE TAPPET ADJUSTMENT (COLD SETTING) IS COMPLETE, START AND RUN THE ENGINE. CHECK THAT THE ENGINE OIL PRESSURE GAUGE IS REGISTERING IN THE GREEN ZONE.

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STEP 18

AFTER DEGLAZING, SWAB CYLINDER SLEEVE WITH A CLEAN CLOTH DAMPENED IN WARM WATER AND A MILD DETERGENT SOAP. AFTER SWABBING THE CYLINDER SLEEVES, WIPE THEM OUT WITH CLEAN CASE HDM OIL OR SAE 10W ENGINE OIL.

NOTE: SWAB AND WIPE OUT THE CYLINDER SLEEVES UNTIL A CLEAN CLOTH REMAINS ABSOLUTELY CLEAN, ONE SWABBING - WIPING OPERATION IS NOT ENOUGH.

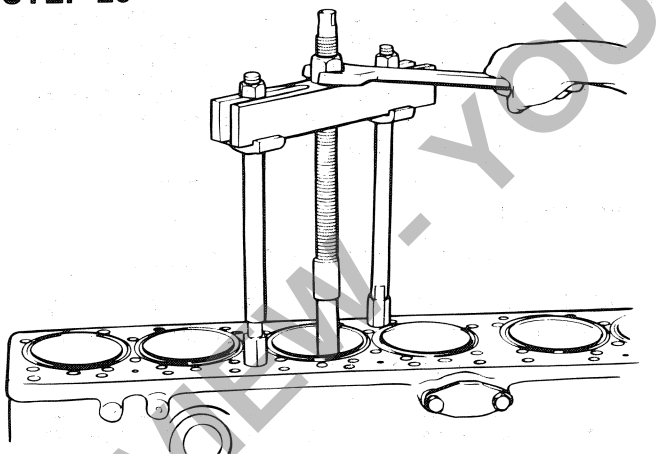
IMPORTANT: DO NOT USE GASOLINE, DIESEL FUEL OR KEROSENE TO CLEAN SLEEVES, SINCE THESE MATERIALS WILL NOT REMOVE THE ABRASIVES FROM SLEEVE SURFACE.

Cylinder Sleeve Removal and Installation

STEP 19

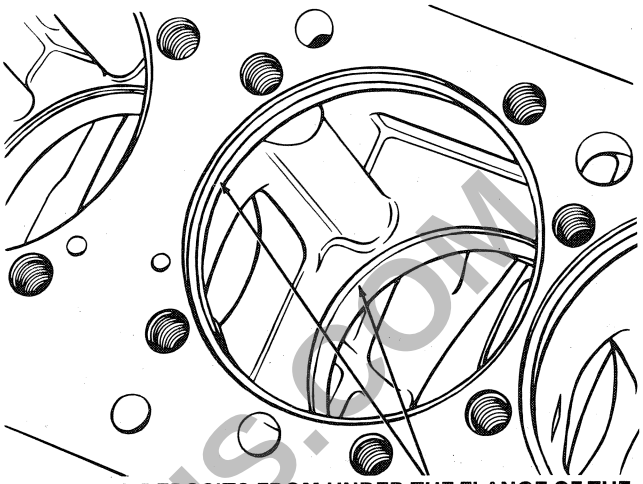
IMPORTANT: BEFORE REMOVING CYLINDER SLEEVES, COVER THE CRANKSHAFT AND MAIN BEARING TO PREVENT SEDIMENT FROM THE BLOCK DAMAGING THESE PARTS.

STEP 20



MARK THE CYLINDER SLEEVES WITH PAINT IN RELATION TO THE BLOCK, IF THE SAME SLEEVES ARE GOING TO BE REINSTALLED. USE A SLEEVE PULLER TO REMOVE CYLINDER SLEEVES.

STEP 21



CLEAN ALL DEPOSITS FROM UNDER THE FLANGE OF THE SLEEVE AND IN THE BORE IN THE BLOCK. THE SLEEVE MUST REST FLAT TO PREVENT DISTORTION. CLEAN THE LOWER SEALING SURFACES IN THE BLOCK AND ON THE SLEEVE TO PREVENT COOLANT LEAKS WHEN THE SLEEVE IS INSTALLED.

NOTE: CHECK THE LOWER BORE CHAMFER IN THE BLOCK. THE CHAMFER MUST BE SMOOTH. SEE SETION 2290 IF THE CHAMFER IS NOT SMOOTH.

STEP 22



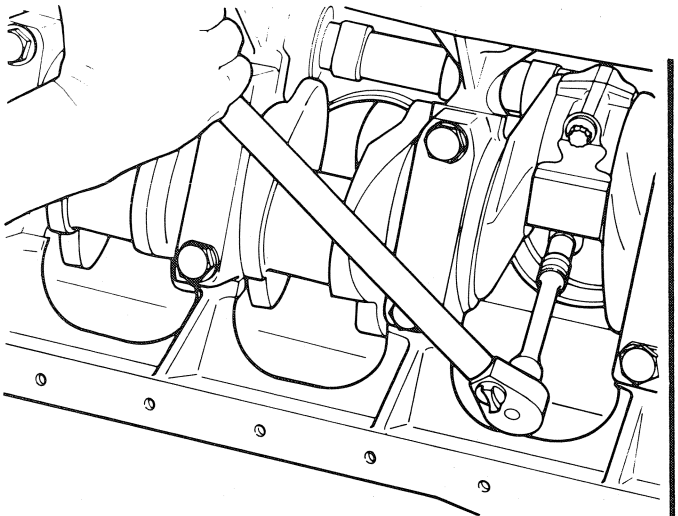
PUSH SLEEVES IN THE BLOCK.

IMPORTANT: INSTALL THE SLEEVE WITHOUT THE O-RINGS.

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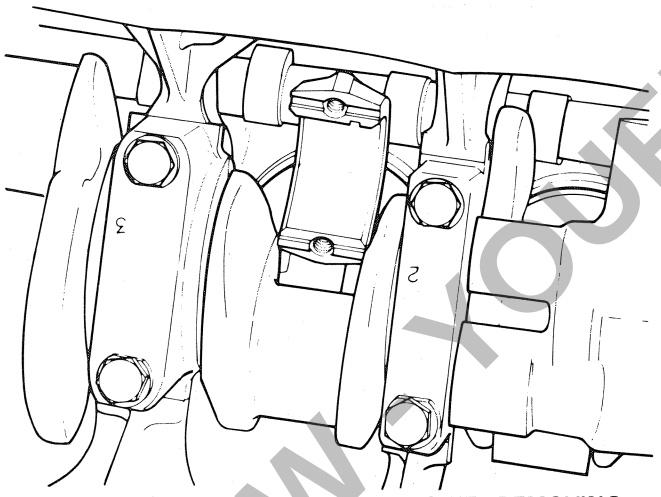
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STEP 11



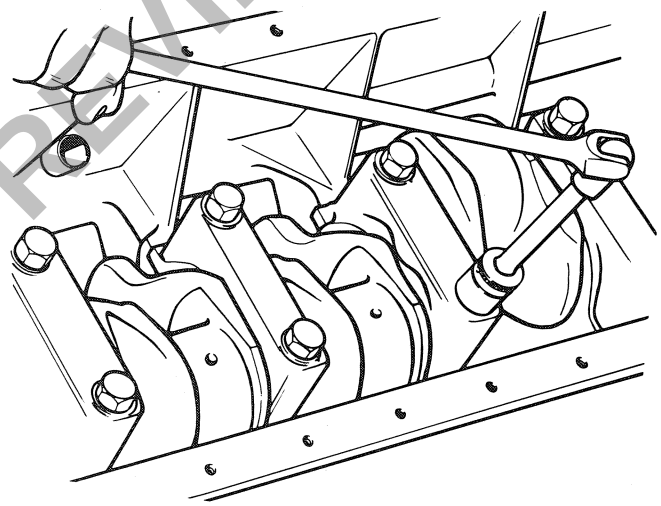
REMOVE THE CONNECTING ROD BEARING CAPS.

STEP 12



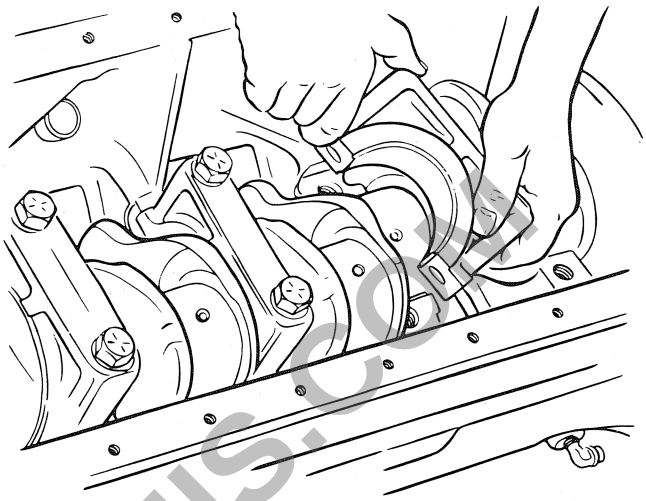
PUSH RODS UP THROUGH ENGINE REMOVING CONNECTING RODS AND PISTONS.

STEP 13



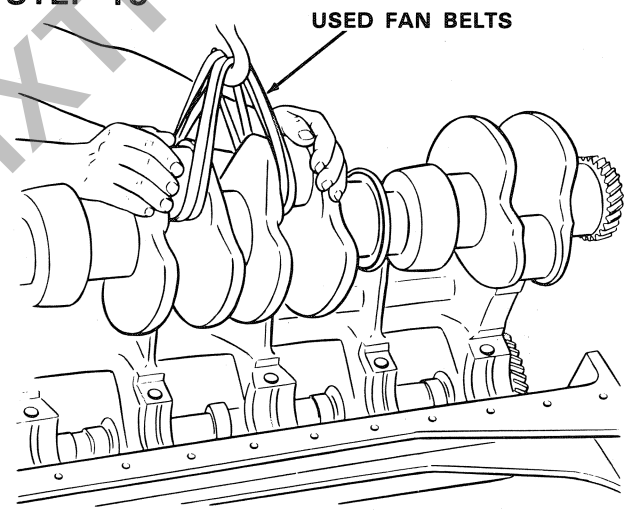
LOOSEN THE CRANKSHAFT MAIN BEARING CAPS.

STEP 14



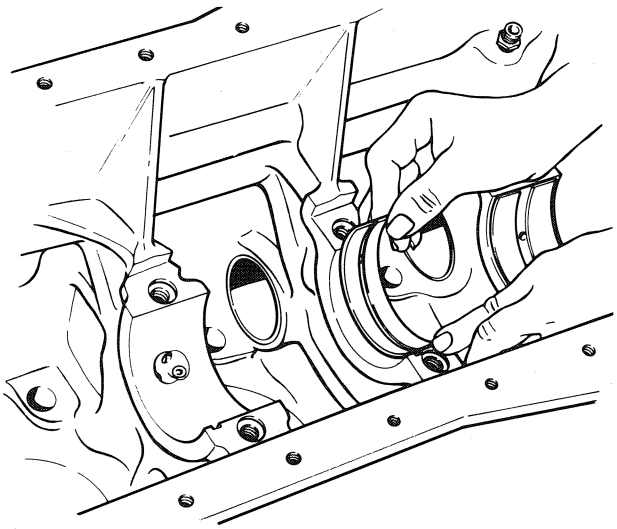
REMOVE THE CRANKSHAFT MAIN BEARING CAPS.

STEP 15



REMOVE CRANKSHAFT FROM ENGINE.

STEP 16



REMOVE MAIN BEARING LINERS FROM ENGINE BLOCK.

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Section

2055

COOLING SYSTEM

Water Manifold, Water Pump and Thermostats

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Section

3012

ROBERT BOSCH FUEL INJECTION PUMPS
FOUR AND SIX CYLINDER "B" SERIES
DIESEL ENGINES

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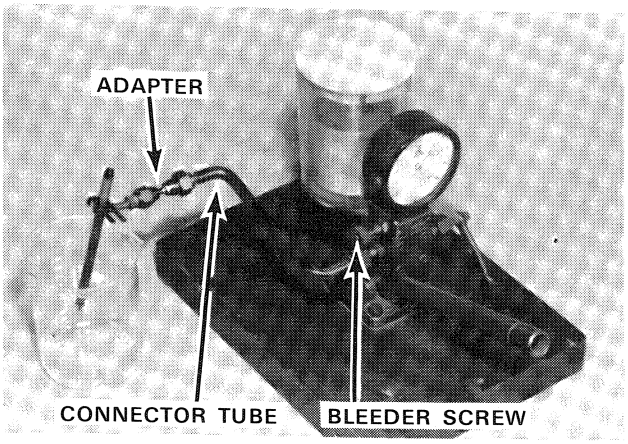
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INJECTOR TEST STAND



An "Approved" Injector Test Stand, Case Part No. M20322 (Bacharach No. 65-934D), is required for testing and adjusting the injectors and can be purchased through the Service Parts Supply, J I Case Co., Racine, Wisc. Except for descriptions referring especially to adjustments on the test stand itself, all of the following instructions will apply to all makes. Operating instructions are also furnished with the test stand.

An injector tool kit, Case Part No. M20520 (Bacharach No. 60-0010), is required to service the injectors. A compression gauge adapter, Bacharach No. 70-314 (D-558) is also included in the tool kit. This kit is used in conjunction with the Case Diesel Tool Kits Case Part No. M20247 (CD-800) and Case Part No. M20246 (CD-350).

The test stand is used to perform the following checks:

1. Check and adjust the injector opening pressure. This is a duplicate of the factory procedure.
2. Check the injector assembly for fuel leakage.
3. Check and adjust the injector leak-off.
4. Accurately check the injector spray pattern.

Fuel injectors must be checked on the test stand when performing the following service operations:

1. Whenever an injector has been removed from the engine for cleaning, the injector must be checked on the test stand prior to installing it on the engine.
2. When a new injector assembly is to be installed, it must be checked on the test stand prior to installing it on the engine.
3. When a complete engine overhaul is performed, the injectors should be removed and checked on the test stand.
4. When an injector is suspected to be the cause of unsatisfactory engine performance, it should be removed from the cylinder head and checked on the test stand prior to disassembling it.

IMPORTANT: ALWAYS CHECK THE PERFORMANCE OF AN INJECTOR ON THE TEST STAND BEFORE DISASSEMBLING IT. IF IT CHECKS OUT SATISFACTORILY, THERE IS NO NEED TO DISASSEMBLE OR ADJUST IT.

Preparing Test Stand

1. After filling the test stand fuel reservoir, loosen the bleeder screw.
2. When the fuel flowing from the bleeder screw opening is free of air bubbles, tighten the screw.
3. Wash the connector tube and adapter in clean diesel fuel. Blow clean with filtered compressed air and connect securely to the test stand.
4. Operate the hand lever slowly until clean fuel flows from the adapter.
5. The test stand is now ready for use. *NOTE:* Complete maintenance instructions are furnished with the test stand. Follow the instructions carefully.

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CAUTION: HOLD THE CONTROL OVER MAIN RELIEF FOR ONLY A FEW SECONDS. HYDRAULIC OIL OVERHEATS RAPIDLY WHEN HELD OVER MAIN RELIEF AND DAMAGE COULD RESULT TO THE RELIEF VALVE.

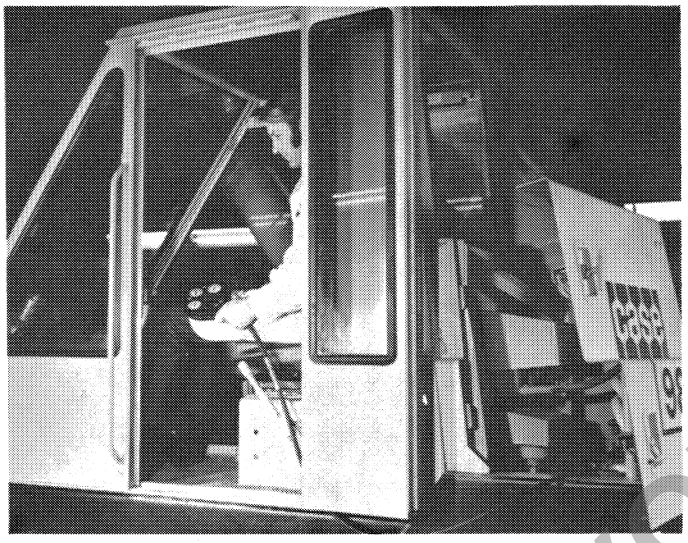


Figure 5

3. With the engine at high idle (2400 RPM)and the hydraulic oil at operating temperature(120°F.) you are ready to being testing. The high idle tests are the first series of checks and are followed by a second series made at low idle.

NOTE: BOTH PUMP CIRCUITS MUST BE TESTED. PUMP NUMBER ONE POWERS THE INNER VALVE BANK AND PUMP NUMBER TWO POWERS THE OUTER BANK.

4. With the pressure gauge connected to the inner bank (pump circuit one), crowd in until the main relief opens. Observe and record the pressure at which it opens in the "Pressure Check" Chart. Neutralize the crowd control as soon as the pressure has been taken.

CAUTION: HEAT BUILDS UP RAPIDLY WHEN IT IS PASSING OVER RELIEF. THIS HEAT CAN DAMAGE THE RELIEF VALVE.

5. Crowd out now until the main relief opens. Record the setting, neutralizing the control as quickly as possible.

6. Activate the fast hoist button (optional), reading and recording the setting of the main valve in the "Pressures" Chart.

The main relief reading should be at the same level for both crowd and fast hoist

Because both the swing and track functions are relieved at lower pressure setting (1350 PSI swing; and 2250 PSI track) you cannot test the main relief with either swing or track alone.

Activate both track and swing together, and the main relief will be opened.

7. Set the swing brake, and pull the track brake control on.

   Simultaneously activate the swing and right track. Read and record the setting at which the main relief opens.

You have completed the High Idle testing of the first pump circuit. Reduce engine RPM to 750 RPM (low idle) for the low idle tests.

Repeat steps 4 through 7 with the engine at low idle. If individual pressures recorded at low idle fall drastically below those taken at high idle internal hydraulic leakage is indicated in the affected circuit. If all pressures fall off at low idle the pump is probably worn. Flowmeter the pump to determine the rate of oil slip-by.

Pump Number Two:

Adjust the engine to high idle (2400 RPM) after moving the pressure gauge connection to the quick-disconnects on pump No. 2. You are ready to test the second pump circuit.

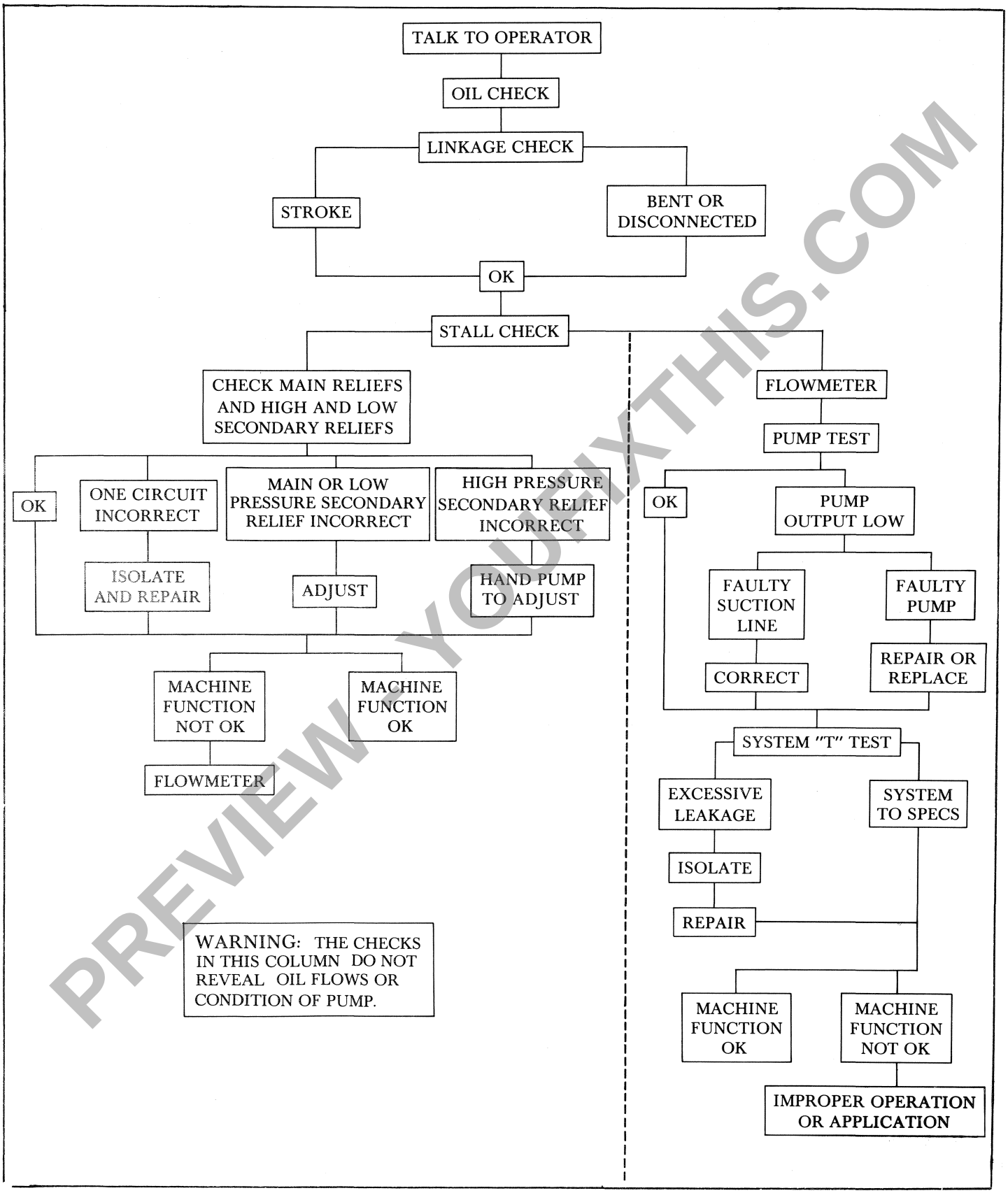
1. Curl the tool until the cylinder is bottomed out. Read and record the main relief valve opening pressure.

2. Dump the tool and record the pressure when the cylinder is bottomed out.

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TROUBLE SHOOTING GUIDE



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Housing

1. Remove and discard "O" rings (7), (17), (23) and (37) from grooves in housing (13), (27) faces.

Port End Cover

1. Pry off the thrust plate (6) with a knife blade or thin screwdriver. Remove and discard the pocket seals (5).

2. Pull the bearings (4) with a bearing puller from the port end cover (3) —ONLY— if they are being replaced.

Bearing Carrier

1. Pry off the thrust plates (14), (26) with a knife blade or thin screwdriver. Remove and discard all pocket seals (15), (25).

2. Pull the four bearings (18) and (24) with a bearing puller from the bearing carrier (21) —ONLY— if they are being replaced.

3. Remove the two shaft bushings (19) and (36).

4. Remove the two roll pins (20), (22) if desired.

Identifying Causes of Motor Failures and Parts Requiring Replacement

As a guide in motor failure analysis and parts replacement please refer to the hydraulic pump section pages 10 and 11.

ASSEMBLY PROCEDURE

Shaft End Cover

1. Place the shaft end cover (45), gear side up, in a vise with soft jaws. Install bronze shaft bushing (36) with flange side toward bottom of bore.

2. Next, install conical spring (35) with smaller end of spring over pilot shoulder of shaft bushing.

3. Install two roller bearings (34) in the bores of the cover —IF— they were removed. Be sure top of spring (35) does not become wedged between bearing and bottom of bearing counterbore.

4. Turn shaft end cover (45) over in vise with flange side up.



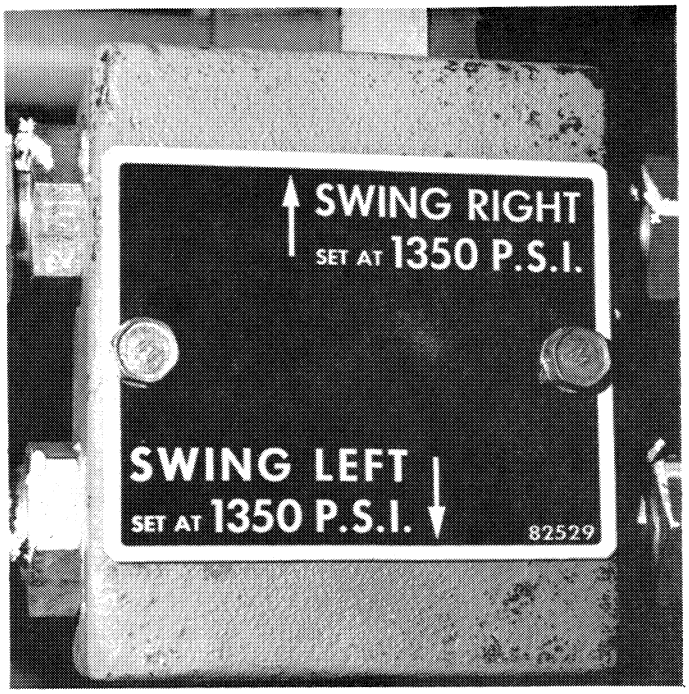
Figure 7. Installing Spring & Bushing into Shaft End Cover



Figure 8. Pressing Bearing onto Drive Shaft

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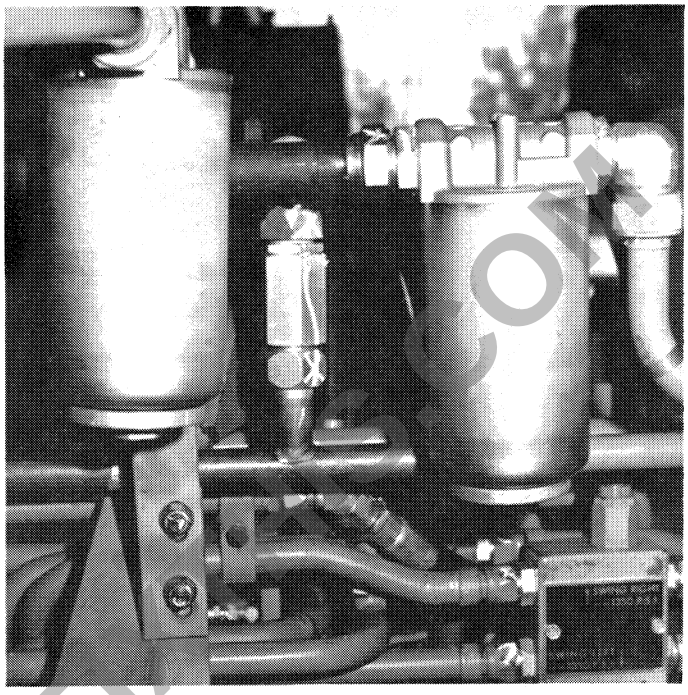


Figure 19. Swing Cusion Relief Valve

SWING CUSHION RELIEF VALVE

The Cushion Relief Valve is designed to act as a cushion when the Swing Motor is suddenly started, stopped or reversed. The work circuit lines pass through the Cushion Relief Valve as shown in Figure 19 .

When pressure build-up on one side of the Swing Circuit exceeds the pressure in the other side of the circuit by a pre-set amount (1350 PSI), the Cushion Relief is forced off its seat, letting oil cross-over to the side having the lower pressure, creating a cushion effect in the Swing Circuit.

The valve does not interfere with the operation of the Swing Motor because, during normal opertion, the pressure differential between the high and low pressure sides does not amount to 1350 PSI

Proper Procedure for Checking Swing Cushion Relief Valve Pressure Settings

There are two separate cartridges inside the Cushion Relief Valve. The top cartridge (bottom adjusting screw) controls swing to the left; and the bottom cartridge (top adjusting screw) controls swing to the right. See Figure 19.

To check the Swing Cushion Relief Valve Cartridges for correct pressure setting, follow this procedure.

1. Attach pressure gauge capable of at least 3000 PSI to the quick-connect fittings in the pressure line from the No. 1 Section of the main pump.
2. Set Swing Brake.
3. Set engine at high idle, 2400 RPM.
4. Activate swing left on control pedal and check reading on gauge. Then activate swing right on control pedal and check reading on gauge. Both readings should be 1350 PSI.

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Track Gauge (extensible gauge standard)	
a-narrow	7' 4"
b-wide	8' 4"
Length of track on ground	13' 8"
Area of ground contact:	
a-24" shoes	6,336 sq. in.
b-30" shoes	7,920 sq. in.
Ground pressure (Lb./Sq. In.)	
a-24" shoes	6.7 Lb./Sq. In.
b-30" shoes	5.7 Lb./Sq. In.
Track shoes:	
a-number per track	49
b-track shoe width	24" standard 30" optional
c-type	3 bar grouser
Track idlers:	
a-number per track	1
b-construction	cast and machined
c-idler centers	130.4"
Rollers:	
a-number, top each side	2
b-number, bottom each side	9
c-construction	cast and machined
d-roller centers - top	40.5"
e-roller spacing- bottom	11.65"
f-roller diameter	9.5"
Track adjustment	hydraulic
Overall length in travel position	29' 4"
Carrier frame:	
a-construction	welded plate

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Figure 43. Turn Transmission Case Over Being Careful Not To Damage Threads Of Output Shaft. Remove The Output And Gear Cluster Covers From The Brake Side Of The Housing. Pound The Bearing Race To Bottom On 2nd Intermediate Cluster With Driver No. 215712.

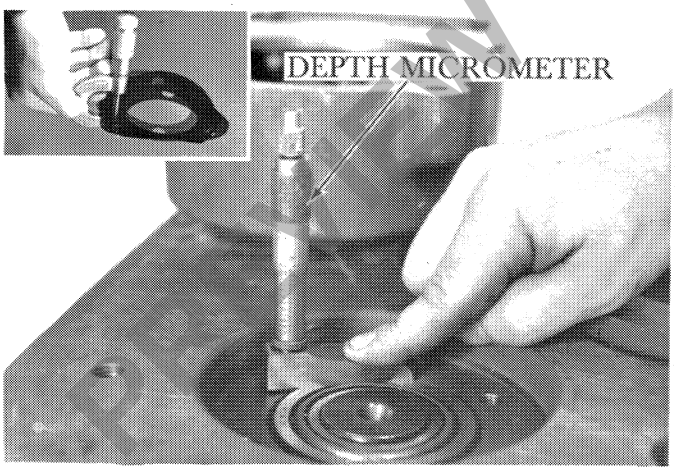


Figure 44. Measure The distance Between The Gear Cluster Bearing Race And Cover Mounting Face In Four Places And Take The Average Of These Four Readings. You Then Subtract .015" From The Average Reading To Obtain The Correct Shim Thickness. Example: If Reading Is .055 You Subtract .015 And Shim To .040. After Selecting Shims Verify Shim Thickness With Micrometer.

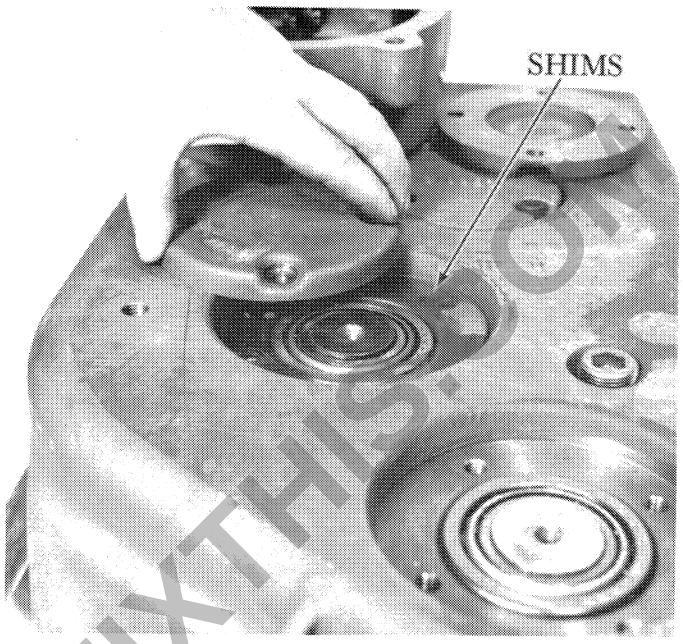


Figure 45. Install Shims For 2nd Intermediate Gear Cluster Torque The Cover To 42-45 Ft./Lbs.

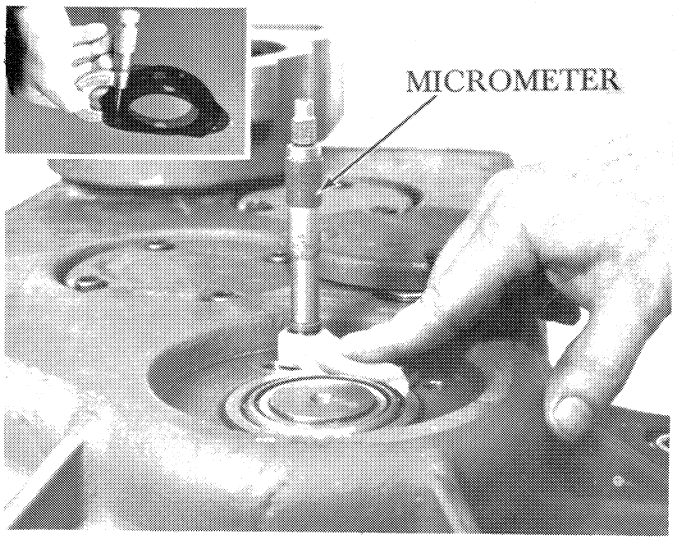


Figure 46. Shim The Output Shaft Cover To The Average Of Four Readings Taken Around The Bearing Cover. This Will Give Zero Pre-Load On Output Shaft Bearings. Verify The Thickness Of The Shims You Select. Torque This Cover To 42-45 Ft./Lbs.

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Remove the left-hand brace (part number S 222532) from the fuel access area. Remove the bolts which hold the swing brake to the mounting plate, and after disconnecting the brake and drain lines, swing the brake backward and block it up. It is not necessary to complete the removal of the swing brake.

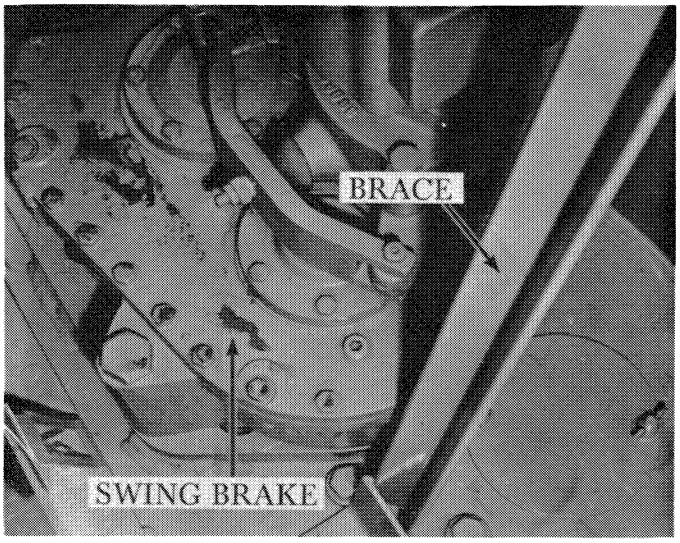


Figure 7. Remove Brace and Disconnect Swing Brake

The last step in the preparation of the CRAWLER is the removal of the cover over the three capscrews which lie directly beneath the boom. A 9/16" wrench will fit the cover bolts.

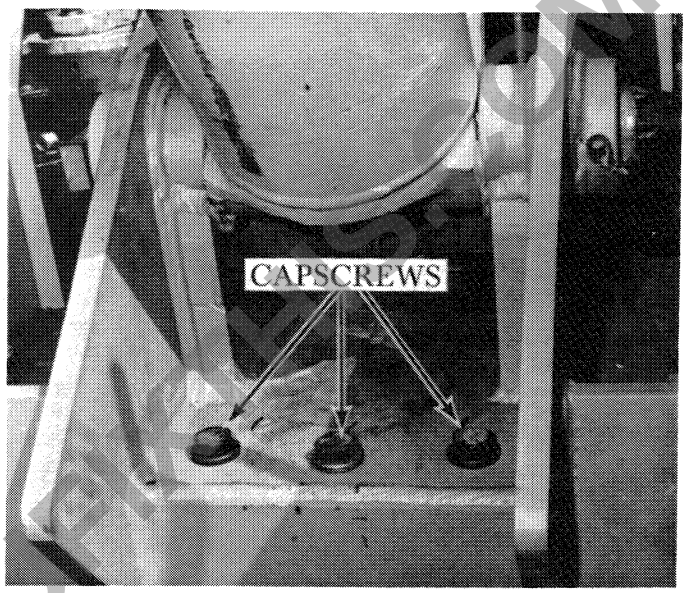


Figure 8. Capscrews Beneath the Boom

The Torquing Check

Begin the torquing check with the capscrews located inside the cab. You will need the torquing wrench with a 1-1/8" 12-point 3/4" drive socket and two 10" vertical extensions. See the Torquing Chart on Page 2 for the proper torque readings. If your EXCAVATOR is one of those with floor holes too small for torquing extensions, you will find it necessary to enlarge the holes for access.

As you move to the valve access area you will need a third 10" vertical extension to reach and check the five capscrews there. See Figure 6.

Eleven capscrews are accessible from behind and beneath the cab over-hang. Weave the extensions through the hoses to reach capscrews. See Figure 9.

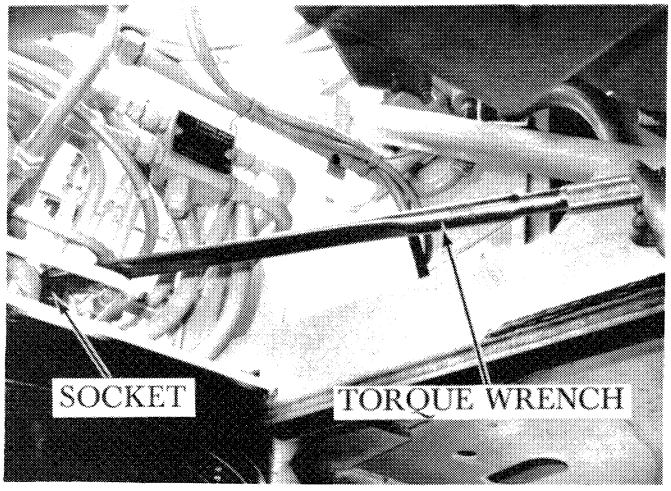


Figure 9. Capscrew Access from Behind and Beneath Cab

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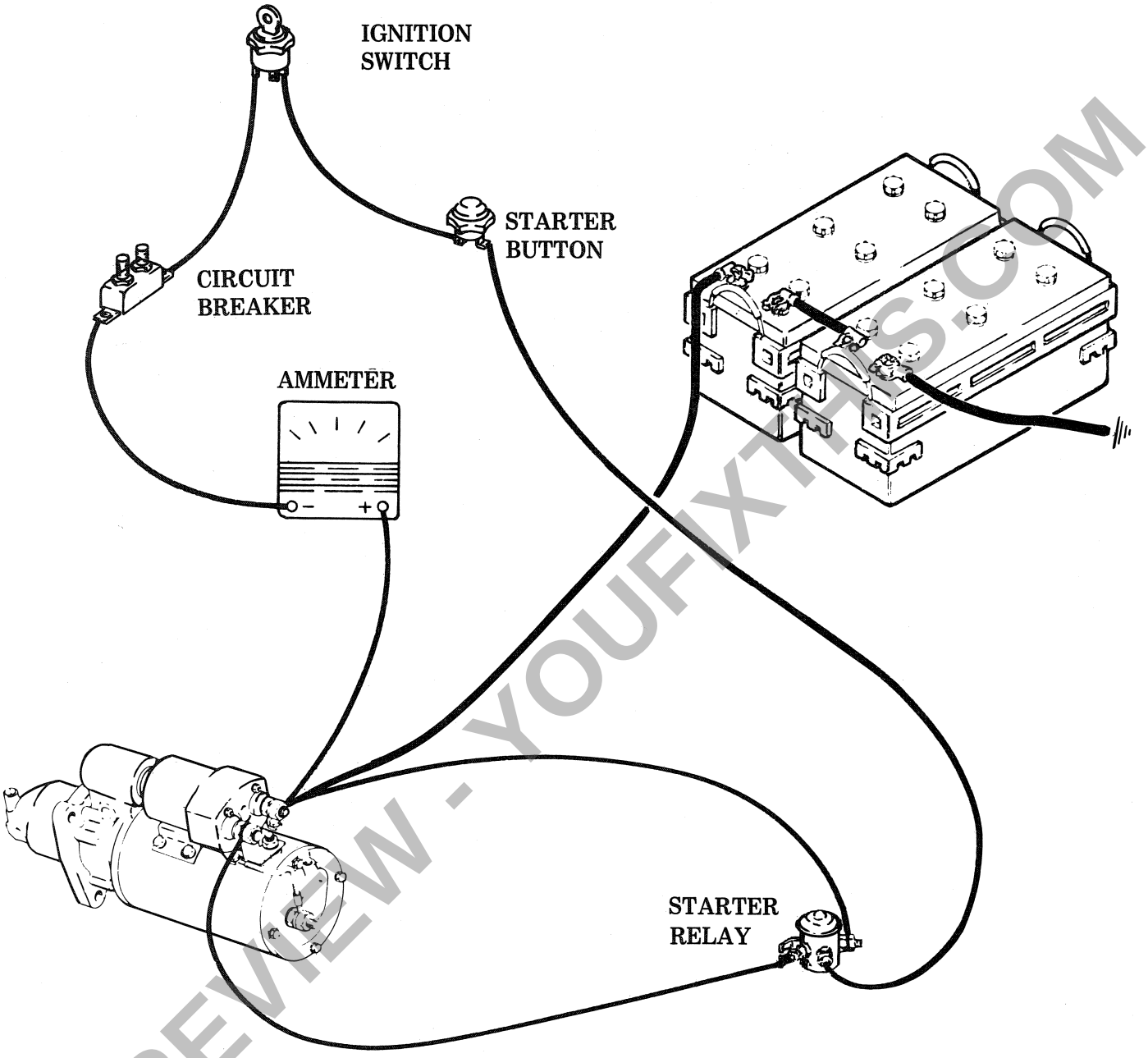


Figure 1. Starter Electrical Circuit

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