PART No. EM18C – 1 – 1

OPERATOR'S MANUAL

EX1900-5

HYDRAULIC EXCAVATOR

Serial No. 000101 and up

HITACHI

MidWestTech | Hitachi EX1900-5 Excavator Operator's Manual | Publication EM18C-1-1 Order the manual at mid-west-tech.com >

CONTENTS

MACHINE NUMBERS

SAFETY

Recognize Safety Information S-1
Understand Signal Words S-1
Follow Safety Instructions S-2
Prepare for Emergencies S-2
Wear Protective Clothing S-3
Protect Against Noise S-3
Inspect Machine S-3
General Precautions for Cab S-4
Use Handholds and Steps S-5
Adjust the Operator's Seat S-5
Fasten Your Seat Belt S-6
Move and Operate Machine Safely S-6
Handle Starting Aids Safely S-6
Operate Only from Operator's Seat S-7
Jump Starting S-7
Keep Riders Off Machine S-7
Investigate Job Site Beforehand S-8
Protect Against Falling Stones and Debris S-8
Provide Signals for Jobs Involving Multiple Numbers of Machines S-9
Confirm Direction of Machine to be Driven S-9
Drive Machine Safely S-10
Avoid Injury from Rollaway Accidents S-11
Avoid Injury from Back-Over and Swing Accidents S-12
Keep Person Clear from Working Area S-13
Never Position Bucket Over Anyone S-13
Avoid Undercutting S-13
Avoid Tipping S-14
Never Undercut a High Bank S-14
Dig with Caution S-15
Operate with Caution S-15
Avoid Power Lines S-15
Object Handling S-16
Protect Against Flying Debris S-16
Park Machine Safely S-17
Handle Fluids Safely – Avoid Fires S-17
Practice Safe Maintenance S-18
Warn Others of Service Work S-19
Support Machine Properly S-19
Stay Clear of Moving Parts S-19
Prevent Parts from Flying S-20
Store Attachments Safely S-20
Prevent Burns S-21
Replace Rubber Hoses Periodically S-21
Avoid High-Pressure Fluids S-22
Prevent Fires S-23
Evacuating in Case of Fire S-24
Beware of Exhaust Fumes S-24
Precautions for Welding and Grinding S-25
Avoid Heating Near Pressurized Fluid Lines S-26
Avoid Applying Heat to Lines Containing Flammable Fluids S-26
Remove Paint Before Welding or Heating S-26
Prevent Battery Explosions S-27
Service Air Conditioning System Safely S-27
Handle Chemical Products Safely S-28
Dispose of Waste Properly S-28

SAFETY SIGNS S-29

COMPONENTS NAME 1-1

HANDLING LADDER/EMERGENCY ESCAPE DEVICE

Using Ladder 1-2
Operating Ladder on the Ground 1-3
Operating Ladder on the Upperstructure 1-3
Emergency Escape 1-4
Emergency Exit 1-5
Evacuating in Case of Fire 1-5

OPERATOR'S STATION

Cab Features 1-7
Monitor Panel and Switch Panels (Left) 1-8
Monitor Panel 1-9
Fuel Gauge 1-10
Hydraulic Oil Temperature Gauge 1-10
Coolant Temperature Gauge 1-10
Tachometer 1-10
Alternator Indicator 1-11
Pump Transmission Oil Pressure Indicator (Warning) 1-11
Engine Oil Pressure Indicator (Warning) 1-11
Overheat Indicator (Warning) 1-11
Hydraulic Oil Level Indicator(Warning) 1-12
Fuel Level Indicator 1-12
Engine Oil Level Indicator 1-12
Download Indicator 1-12
Coolant Level Indicator 1-13
Hydraulic Oil Level Indicator 1-13
Travel Mode Indicator (Slow Speed) 1-13
Auto Idle Indicator 1-13
Engine Room Light Indicator 1-14
Entrance Light Indicator 1-14
Preheat Indicator 1-14
Travel Mode Indicator (Fast Speed) 1-14
Coolant Level Indicator (Warning) 1-15
Auto-Lubrication Indicator 1-15
Engine Stop Indicator 1-15
Engine Warning Indicator 1-15
Engine Exhaust Gas Temperature Indicator 1-16
Air Cleaner Restriction Indicator 1-16
Pump Contamination Indicator 1-16
Stop Valve Indicator (Warning) 1-17

MidWestTech | Hitachi EX1900-5 Excavator Operator's Manual | Publication EM18C-1-1 Order the manual at mid-west-tech.com >

CONTENTS

Emergency Engine Stop Indicator 1-17
Ladder Position Indicator 1-17
Switch Panel 1-18
Wiper Switch 1-19
Wiper Delay Selector Switch 1-19
Washer Switch 1-19
Air Conditioners 1-20
Cooling 1-22
Heating 1-22
Dehumidifying and Heating 1-23
Defrosting 1-24
Blower Operation without Cooling or Heating 1-25
Ventilation the Cab 1-25
Indicator Light Check Switch 1-26
Level Check Switch 1-27
Buzzer Stop Switch 1-28
Dimmer Switch 1-29
Engine Speed Control Lever 1-29
Work Light Switch 1-30
Dome Light Switch 1-31
Engine Room Light Switch 1-32
Entrance Light Switch 1-33
Travel Speed Switch 1-34
Auto-Idle Switch 1-34
Switch Panel (Right) 1-35
Emergency Engine Stop Switch 1-35
Key Switch 1-35
Preheat Switch 1-36
Engine Troubleshooting Switch 1-37
Hour Meter 1-38
Horn Switch 1-38
FM/AM Radio Operation 1-39
Digital Clock Setting Procedure 1-40
Operator's Seat Adjustment 1-41
Seat Belt 1-43
Cab Door Release Button 1-44
Opening Cab Left Window 1-44

BREAK-IN

Observe Machine Closely 2-1
Every 10 Hours or Each Shift 2-1
After the First 50 Hours 2-2

OPERATING THE ENGINE

Inspect Machine Daily Before Starting 3-1
Check Instruments Before Starting 3-2
Level Check 3-3
Starting the Engine 3-4
Starting in Cold Weather 3-5
Check Instruments After Starting 3-7
Using Booster Batteries 3-8
Stopping the Engine 3-10
Emergency Engine Stop Switch 3-11
Engine Stoop Switches 3-12

DRIVING THE MACHINE

Drive the Machine Carefully 4-1
Steering the Machine Using Pedals 4-2
Steering the Machine Using Levers 4-3
Travel Speed Switch 4-4
Travel Alarm 4-5
Traveling 4-6
Operating on Soft Ground 4-7
Raise One Track Using Boom and Arm 4-7
Towing Machine a Short Distance 4-8
Operating in Water or Mud 4-9
Precautions for Traveling on Slopes 4-10
Parking the Machine on Slopes 4-11
Parking the Machine 4-11

OPERATING THE MACHINE

Control Lever (HITACHI Pattern Backhoe) 5-1
Control Lever (ISO Pattern Backhoe) 5-2
Control Lever (HITACHI Pattern Loading Shovel) 5-3
Control Lever (ISO Pattern Loading Shovel) 5-4
Bucket Open-Close Pedals (Loading Shovel) 5-5
Pilot Control Shut-Off Lever 5-6
Warming-Up Operation 5-7
Warming-Up the Motor and the Cylinders 5-8
Auto-Idle 5-9
Engine Speed Control 5-10
Precautions for Operations 5-11
Operate the Machine Safely 5-12
Operating Backhoe 5-13
Grading Operation 5-13
Avoid Abusive Operation 5-14
Operating Tips 5-15
Avoid Swinging Bucket to Move Objects 5-15
Loading Shovel Operation 5-16
Prohibited Operation 5-16
Object Handling — If Equipped 5-19
Overnight Storage Instructions 5-20

MAINTENANCE

Correct Maintenance and Inspection Procedures 7-1
Service Your Machine at Specified Intervals 7-2
Check the Hour Meter Regularly 7-2
Use Correct Fuels and Lubricants 7-2
Prepare Machine for Maintenance 7-3
Open Access Doors for Service 7-5
Inspection/Maintenance Lights 7-6
Use a Chain to Prevent Falling Accidents 7-7
Construction Outline 7-9
Hydraulic System 7-10
Periodic Replacement of Rubber Hoses 7-13
Maintenance Interval Guide 7-17
A. Greasing 7-21

MidWestTech | Hitachi EX1900-5 Excavator Operator's Manual | Publication EM18C-1-1 Order the manual at mid-west-tech.com >

CONTENTS

Loading Shovel Front Joint Pins 7-22
Backhoe Front Joint Pins 7-25
Swing Bearing 7-28
Swing Internal Gear 7-29
Center Joint 7-30
Operating the Lubricator 7-31
B. Engine 7-33
Engine Oil Level 7-34
Change Engine Oil 7-35
Replace Engine Oil Filters 7-35
Check Alternator Belt Tension 7-36
Check Injection Nozzle 7-37
Inspect Bolts and Nuts Outside Engine 7-37
Inspect and Adjust Valve Clearance 7-37
Check Fuel Injection Timing 7-37
Check Starter and Alternator 7-37
Check Turbocharger 7-37
C. Transmission 7-38
Pump Transmission 7-39
Swing Reduction Gear 7-42
Travel Reduction Gear 7-44
D. Hydraulic System 7-46
Inspection and Maintenance of Hydraulic Equipment 7-47
Check Hydraulic Oil Level 7-49
Drain Hydraulic Oil Tank Sump 7-50
Change Hydraulic Oil 7-51
Replace Full-Flow Filter and Drain Filter 7-54
Replace Pilot Oil Filter 7-56
Suction Filter 7-58
Replace High-Pressure Strainer 7-60
Clean Oil Cooler Core 7-61
Check Hoses and Lines 7-62
Service Recommendations for Hydraulic Fittings 7-65
E. Fuel System 7-67
Refueling 7-67
Drain Fuel Tank Sump 7-69
Water Separator Filter 7-69
Replace Fuel Filter 7-70
Check Fuel Hoses 7-72
F. Air Cleaner 7-74
Clean Air Cleaner Outer Element 7-74
Replace Air Cleaner Outer and Inner Elements 7-74
G. Cooling System 7-76
Check Coolant Level 7-78
Clean Radiator Core 7-80
Clean Intercooler Core 7-80
H. Air Conditioner 7-81
Recirculation Air Filter 7-81
Ventilation Air Filter 7-82
Check Refrigerant Quantity 7-83
Check Compressor Belt Tension 7-84
Clean Condenser Core 7-85
Check Tightening Torque 7-86
Seasonal Maintenance 7-87
I. Electrical System 7-88
Batteries 7-88
Replace Batteries 7-91
Replacing Fuses 7-92
Power Source Terminal 7-94
Fusible Link 7-95
Check Electrical Cables and Wire Harnesses for Short Circuits 7-96
Check Emergency Engine Stop Switch 7-98
J. Miscellaneous 7-99
Check Bucket Teeth 7-100
Inspect Emergency Evacuation Equipment and Hanger 7-104
Auto-Lubrication System 7-105
Check and Replace Seat Belt 7-109
Check Windshield Washer Fluid Lever 7-109
Check and Adjust Track Sag 7-110
Check Accumulator and Track Adjuster Cylinder Circuit 7-112
Check Side Frame Area 7-112
Check Tightening Torque of Bolts and Nuts 7-113

MAINTENANCE UNDER SPECIAL ENVIRONMENTAL CONDITIONS

Maintenance Under Special Environmental Conditions 9-1

STORAGE

Storing the Machine 10-1
Removing the Machine from Storage 10-2

TROUBLESHOOTING

Engine Troubleshooting 11-1
Engine 11-3
Electrical System 11-7
Control Levers 11-10
Hydraulic System 11-10
Auto-Idle 11-13

SPECIFICATIONS

Specifications 12-1
Working Range (Loading Shovel) 12-2
Working Range (Backhoe) 12-3

INDEX 14-1

MidWestTech | Hitachi EX1900-5 Excavator Operator's Manual | Publication EM18C-1-1 Order the manual at mid-west-tech.com >

PILOT CONTROL SHUT-OFF LEVER

Pilot control shut-off lever (1) functions to prevent misoperation of the machine from occurring if the control levers are accidentally moved when leaving the operator's seat or when entering the cab.

CAUTION:

1. **Always pull pilot control shut-off lever (1) into the full LOCK position. The pilot control shut-off function will not be activated otherwise.**
2. **When leaving the machine:**
   - **Stop the engine.**
   - **Then, pull the pilot control shut-off lever up to the LOCK position.**
3. **Always check to be sure that the pilot control lever is pulled up to the LOCK position before:**
   - **Transporting the machine.**
   - **Leaving the machine at the end of the shift.**
4. **Take care not touch any control levers and travel levers before operating the pilot control shut-off lever. If any control levers are operated before moving the pilot control shut-off lever to the UNLOCK position, the machine may unexpectedly move when the pilot control shut-off lever is operated, possibly causing personal injury or death.**

Pilot Control Shut-Off Lever Operation

Before Leaving the Machine:

1. Park the machine on a firm, level surface. Lower the bucket to the ground. Return all control levers to neutral. Properly shut down the engine.
2. Pull pilot control shut-off lever (1) up into the full LOCK position.

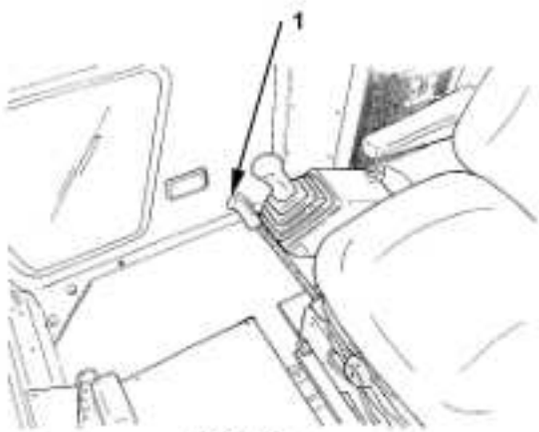
Before Starting Operation:

1. Confirm that pilot control shut-off lever (1) is pulled up to the LOCK position.

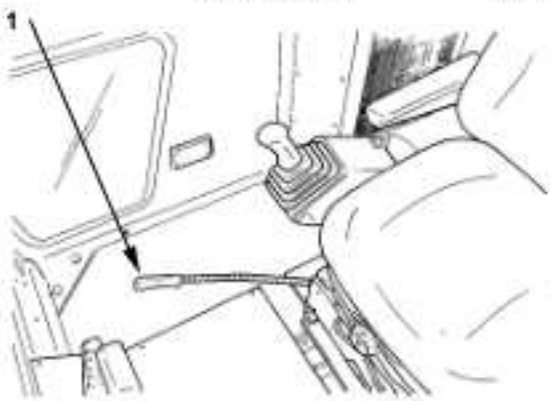
After starting the engine:

1. Confirm that all control levers and pedals are in neutral and that no part of the machine is in motion.
2. Lower pilot control shut-off lever (1) to the UNLOCK position.

If any part of the machine (any actuator) moves when the pilot control shut-off lever is lowered to the UNLOCK position despite the fact that all controls are placed in neutral, the machine is malfuntioning. Immediately pull the pilot control shut-off lever back to the LOCK position, and stop the engine. Then, see your authorized dealer.



LOCK Position M117-05-002



UNLOCK Position M117-05-003

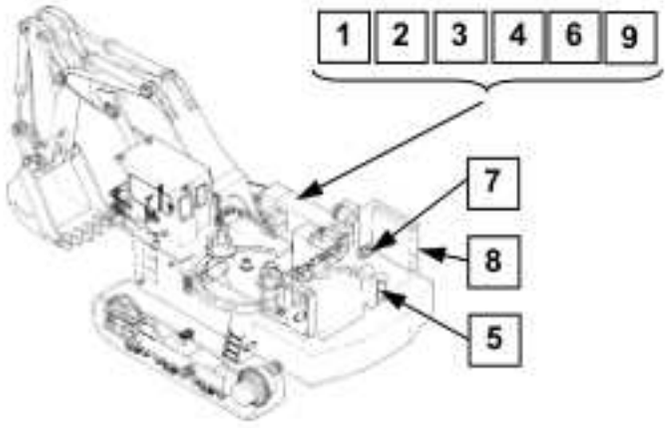
MidWestTech | Hitachi EX1900-5 Excavator Operator's Manual | Publication EM18C-1-1 Order the manual at mid-west-tech.com >

D. HYDRAULIC SYSTEM

Parts		Quantity	Interval (hours)							
			10	50	250	500	2000	2500	4000	12000
1. Check Hydraulic Oil Level		1	*							
2. Drain Hydraulic Oil Tank Sump		1								
3. Change Hydraulic Oil		2200 L (580 US gal)					★	★	★	
4. Replace Full-Flow Filter and Drain Filter		4		*						
5. Replace Pilot Oil Filter		1		*						
6. Suction Filter	Clean Filter	2	When changing hydraulic oil							
	Replace Filter	2								
7. Replace High-Pressure Strainer		3								
8. Clean Oil Cooler Core		1								
9. Check Hoses and Lines (for leak, loose)		–								
Check Hoses and Lines (for crack, bend, etc.)		–								

NOTE: ★ Hydraulic oil changing interval differs according to the kind of hydraulic oil used. See recommended oil chart.

** First time only.*



M18C-01-039

Brand Names of Recommended Hydraulic Oil

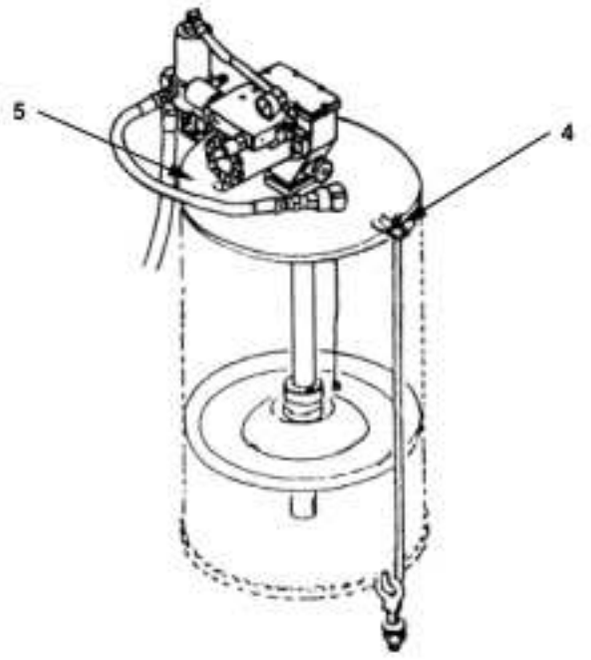
Kind of Lubricant	Hydraulic Oil					
Where to be applied	Hydraulic System					
Change Interval	4000 hours		2500 hours		2000 hours	
Environmental Temp. / Manufacturer	–20 to 50°C (–4 to 122°F)	–10 to 50°C (14 to 122°F)	–20 to 50°C (–4 to 122°F)	–10 to 50°C (14 to 122°F)	–20 to 50°C (–4 to 122°F)	–10 to 50°C (14 to 122°F)
Hitachi	Super EX 46HN					
Idemitsu Kosan			Super Hydro 46 WRHU			
British Petroleum					Bartran HV46	
Caltex Oil						Rando Oil HD46
Texaco INC.						Rando Oil HD46
Chevron U.S.A INC.						Chevron AW46
Esso						NUTO H46
Mobil Oil						DTE 25
Shell Oil				Tellus Oil S46		Tellus Oil 46
Remarks	Anti-wear type hydraulic oil					

NOTE: Use proper hydraulic oil in accordance with the atmospheric temperature. The machine shipped from the factory is filled with oil marked ▭ .

MidWestTech | Hitachi EX1900-5 Excavator Operator's Manual | Publication EM18C-1-1 Order the manual at mid-west-tech.com >

Check Grease Level --- daily

Remove two wing nuts (4). Open grease-can top cover assembly (5) to check quantity of grease inside. Add grease if necessary.

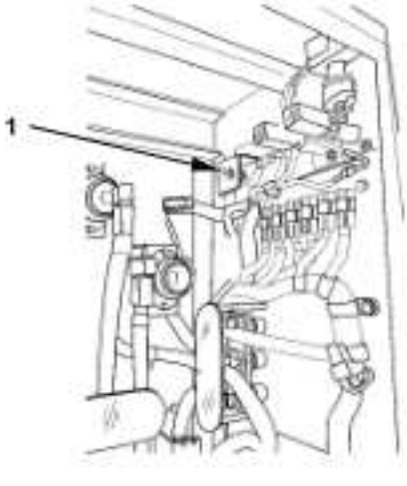


M146-07-107

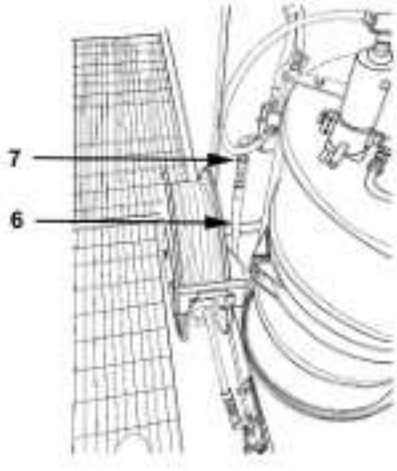
Automatic Greasing

Move auto-lubrication toggle switch (1) to the AUTO LUB. position. Disconnect hose (6) at coupler (7). The grease pump intermittently delivers grease for approximately one minute with an interval of 3 minutes according to the greasing schedule preset at the factory. The greasing schedule, interval and volume, can be adjusted as shown below.

IMPORTANT: Do not adjust greasing interval to be too long or the greasing volume to be too small.



M160-07-011



M141-07-017

MidWestTech | Hitachi EX1900-5 Excavator Operator's Manual | Publication EM18C-1-1 Order the manual at mid-west-tech.com >