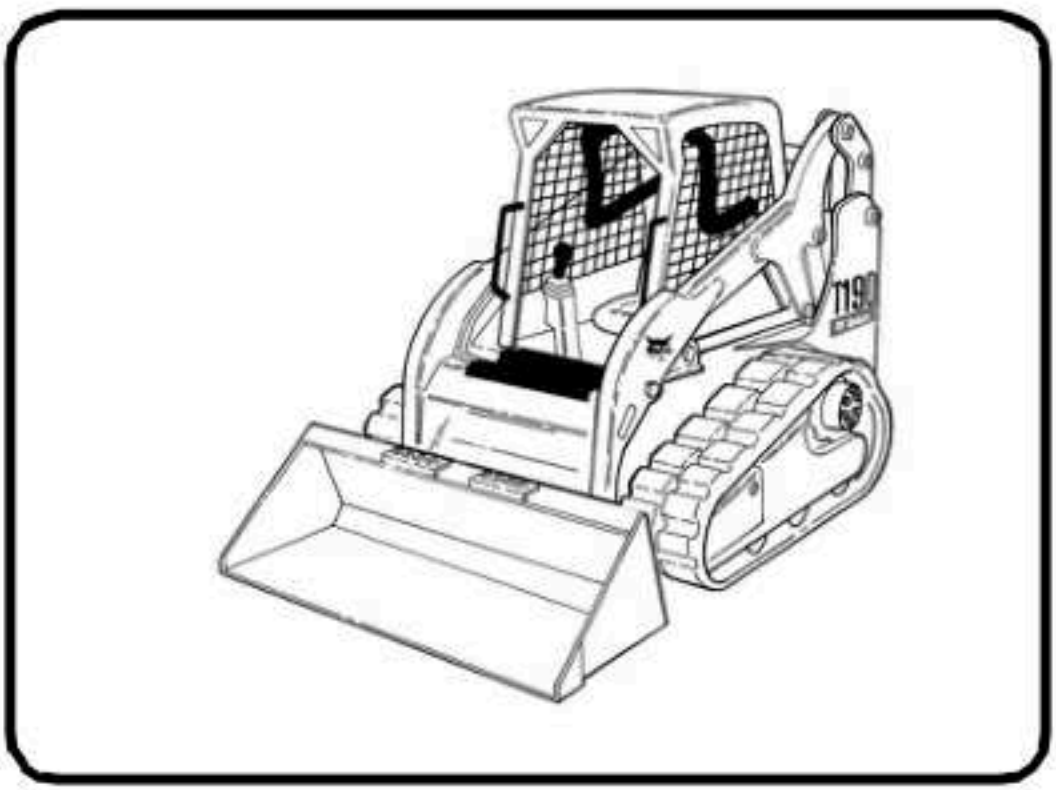
Bobcat®

# Service Manual
# T190 Compact Track Loader

## S/N A3LN11001 & Above
## S/N A3LP11001 & Above



**EQUIPPED WITH BOBCAT INTERLOCK CONTROL SYSTEM (BICS™)**

6987052 (8-08)

Printed in U.S.A.

© Bobcat Company 2008

MidWestTech | Bobcat T190 Compact Track Skid Loader Service Manual | Publication 698... Order the manual at mid-west-tech.com >

## ALPHABETICAL INDEX


ACCESS PANEL (INSIDE) ..... 50-01
ACCESS PANEL (INSIDE) (SJC) ..... 50-01
AIR CLEANER ..... 70-01
AIR CLEANER SERVICE ..... 10-01
AIR CONDITIONING SYSTEM FLOW ..... 80-01
ALTERNATOR ..... 60-01

BACK-UP SYSTEM ..... 60-01
BATTERY ..... 60-01
BLOWER FAN ..... 80-01
BOBCAT INTERLOCK CONTROL SYSTEM (BICS) ..... 60-01
BOBCAT CONTROLLER (ACS) ..... 60-01
BOBCAT CONTROLLER (GATEWAY AND AUXILIARY) ..... 60-01
BOBCAT CONTROLLER (SJC) (DRIVE) ..... 60-01
BOB-TACH (HAND LEVER) ..... 10-01, 50-01
BOB-TACH (POWER) ..... 10-01, 50-01
BRAKE ..... 40-01
BUCKET POSITION VALVE ..... 20-01

CALIBRATION ..... 60-01
CAMSHAFT AND TIMING GEARS ..... 70-01
CHAINCASE ..... 40-01
CHARGE PRESSURE ..... 30-01
COMPRESSOR ..... 80-01
CONDENSER ..... 80-01
CONTROL HANDLE/LEVER ..... 50-01
CONTROL HANDLE/LEVER (ACS) ..... 50-01
CONTROL HANDLE/LEVER (SJC) ..... 50-01
CONTROL PANEL ..... 50-01
CONTROL PANEL (SJC) ..... 50-01
CONTROL PANEL SETUP ..... 60-01
CONTROL PEDALS AND LINKAGE ..... 50-01
CONTROL PEDALS (ACS) ..... 50-01
CONTROL SYSTEM (ACS) ..... 50-01
CONVERSIONS ..... SPEC-01
CRANKSHAFT AND PISTONS ..... 70-01
CYLINDER (LIFT) ..... 20-01
CYLINDER (BOB-TACH) ..... 20-01
CYLINDER (TILT) ..... 20-01
CYLINDER HEAD ..... 70-01

DIAGNOSTICS SERVICE CODES ..... 60-01
DRIVE BELT ..... 30-01
DRIVE COMPONENTS ..... 40-01

ELECTRICAL SYSTEM INFORMATION ..... 60-01
ELECTRICAL/HYRAULIC CONTROLS ..... 60-01
ELECTRICAL/HYRAULIC CONTROLS (SJC) ..... 60-01
ENGINE ..... 70-01
ENGINE COOLING SYSTEM ..... 10-01, 70-01
ENGINE INFORMATION ..... 70-01
ENGINE LUBRICATION SYSTEM ..... 10-01
ENGINE SPEED CONTROL (SJC) ..... 70-01
EVAPORATOR COIL ..... 80-01
EVAPORATOR/HEATER UNIT ..... 80-01

EXHAUST GAS RECIRCULATION (EGR) SYSTEM ..... 70-01

FINAL DRIVE TRANSMISSION (CHAINCASE) ..... 10-01
FLYWHEEL AND HOUSING ..... 70-01
FLYWHEEL RPM SENSOR ..... 60-01
FRONT AUXILIARY HYD. COUPLER BLOCK ..... 20-01
FUEL SYSTEM ..... 10-01, 70-01
FUEL TANK ..... 50-01

HEATER COIL ..... 80-01
HEATER VALVE ..... 80-01
HIGH FLOW VALVE ..... 20-01
HYDRAULIC CONNECTION SPECS. ..... SPEC-01
HYDRAULIC CONTROL VALVE ..... 20-01
HYD./HYDRO FLUID SPECIFICATIONS ..... SPEC-01
HYDRAULIC FLUID RESERVOIR ..... 20-01
HYDRAULIC/HYDROSTATIC FILTERS ..... 20-01
HYDRAULIC/HYDROSTATIC SYSTEM ..... 10-01
HYDRAULIC PUMP (STANDARD) ..... 20-01
HYDRAULIC PUMP (STANDARD) (HIGH FLOW) ..... 20-01
HYDRAULIC PUMP (SJC) (HIGH FLOW) ..... 20-01
HYDARULIC PUMP (SJC) ..... 20-01
HYDRAULIC SYSTEM INFORMATION ..... 20-01
HYDROSTATIC MOTOR ..... 30-01
HYDROSTATIC MOTOR CARRIER ..... 30-01
HYDROSTATIC PUMP ..... 30-01
HYDROSTATIC PUMP (SJC) ..... 30-01
HYDROSTATIC SYSTEM INFORMATION ..... 30-01

INSTRUMENT PANELS ..... 60-01

LIFT ARMS ..... 50-01
LIFT ARM BYPASS CONTROL VALVE ..... 20-01
LIFT ARM SUPPORT DEVICE ..... 10-01
LIFTING AND BLOCKING THE LOADER ..... 10-01
LIGHTS ..... 60-01
T190 LOADER SPECIFICATIONS ..... SPEC-01
LOADER STORAGE AND RETURN TO SERVICE 10-01
LUBRICATING THE LOADER ..... 10-01
LUBRICATION SYSTEM ..... 70-01

MAIN RELIEF VALVE ..... 20-01
MAINTENANCE CLOCK ..... 60-01
MUFFLER ..... 70-01

OIL COOLER ..... 20-01
OPERATOR CAB ..... 10-01, 50-01
OPERATOR SEAT (SUSPENSION) ..... 50-01

PASSWORD SETUP (IF EQUIPPED WITH KEYLESS START) ..... 60-01
PIVOT PINS ..... 10-01
POWER BOB-TACH (OPTION) ..... 10-01, 50-01
POWER BOB-TACH BLOCK ..... 20-01
PRESSURE RELIEF VALVE ..... 80-01
PRESSURE SWITCH ..... 80-01


MidWestTech | Bobcat T190 Compact Track Skid Loader Service Manual | Publication 698... Order the manual at mid-west-tech.com >

REAR AUXILIARY DIVERTER VALVE ..... 20-01
REAR DOOR ..... 50-01
REAR GRILL ..... 50-01
RECEIVER/DRIER ..... 80-01
REGULAR MAINTENANCE ..... 80-01
REMOTE STARTTOOL KIT-MEL1563 ..... 10-01
REMOTE START TOOL (SERVICE TOOL)
KIT-6689779 ..... 10-01

SEAT BAR ..... 50-01
SEAT BAR SENSOR ..... 60-01
SERVICE PC (LAPTOP COMPUTER) ..... 60-01
SERVICE SCHEDULE ..... 10-01
SPARK ARRESTOR MUFFLER ..... 10-01
SPEED SENSORS (SJC) ..... 60-01
STARTER ..... 60-01
STEERING DRIFT COMPENSATION ..... 60-01
STOPPING THE ENGINE AND
LEAVING THE LOADER ..... 10-01
SYSTEM CHARGING AND RECLAMATION ..... 80-01

TEMPERATURE/PRESSURE ..... 80-01
THERMOSTAT ..... 80-01
TIRE MAINTENANCE ..... 10-01
TORQUE SPECIFICATIONS FOR BOLTS .... SPEC-01
TOWING THE LOADER ..... 10-01
TRACTION LOCK ..... 60-01
TRANSPORTING LOADER ON A TRAILER ..... 10-01
TROUBLESHOOTING ..... 80-01
TURBOCHARGER ..... 70-01

WINDOW (FRONT DOOR) ..... 50-01
WINDOW (REAR) ..... 50-01
WINDOW (SIDE) ..... 50-01
WINDOW (TOP) ..... 50-01

MidWestTech | Bobcat T190 Compact Track Skid Loader Service Manual | Publication 698... Order the manual at mid-west-tech.com >

## CONTENTS


FOREWORD . . . . . II

SAFETY INSTRUCTIONS . . . . . V

FIRE PREVENTION . . . . . VII

SERIAL NUMBER LOCATION . . . . . IX

DELIVERY REPORT . . . . . X

LOADER IDENTIFICATION . . . . . XI

SAFETY & MAINTENANCE . . . . . 10-01

HYDRAULIC SYSTEM . . . . . 20-01

HYDROSTATIC SYSTEM . . . . . 30-01

DRIVE SYSTEM . . . . . 40-01

MAIN FRAME . . . . . 50-01

ELECTRICAL SYSTEM & ANALYSIS. . . . . 60-01

ENGINE SERVICE . . . . . 70-01

HEATING, VENTILATION, AIR CONDITIONING . . . . . 80-01

SPECIFICATIONS. . . . . SPEC-01



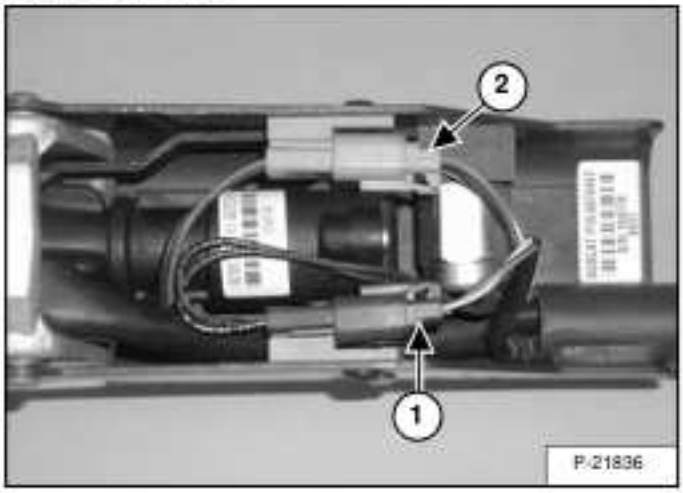




MidWestTech | Bobcat T190 Compact Track Skid Loader Service Manual | Publication 698... Order the manual at mid-west-tech.com >

### Handle Lock Solenoid Removal And Installation

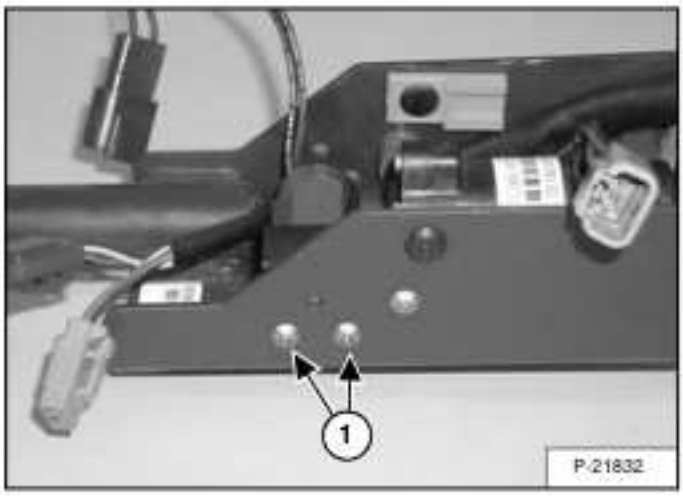
**Figure 60-130-24**




Disconnect the harness connector (Item 1) **[Figure 60-130-24]** from the handle sensor connector.

Disconnect the harness connector (Item 2) **[Figure 60-130-24]** from the handle lock solenoid connector.

**Figure 60-130-25**



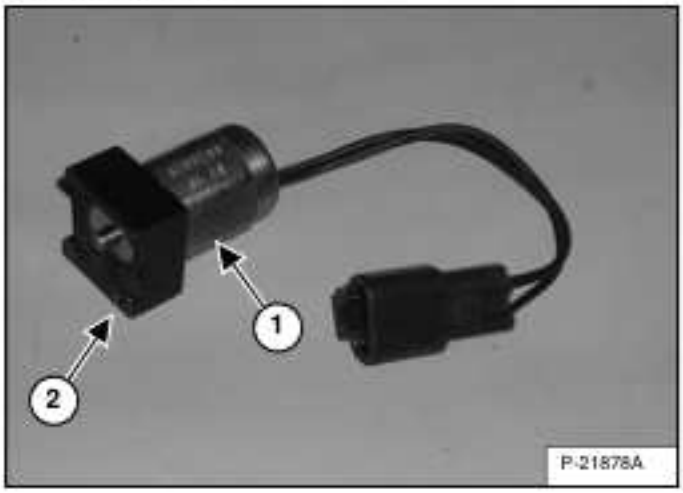

Remove the two screws (Item 1) **[Figure 60-130-25]** holding the handle lock solenoid to the handle.

***Installation:*** Tighten the screws to 32-38 in.-lb. (3.6-4.3 N•m) torque.

Remove handle lock solenoid assembly from handle.

### Handle Lock Solenoid Disassembly And Assembly

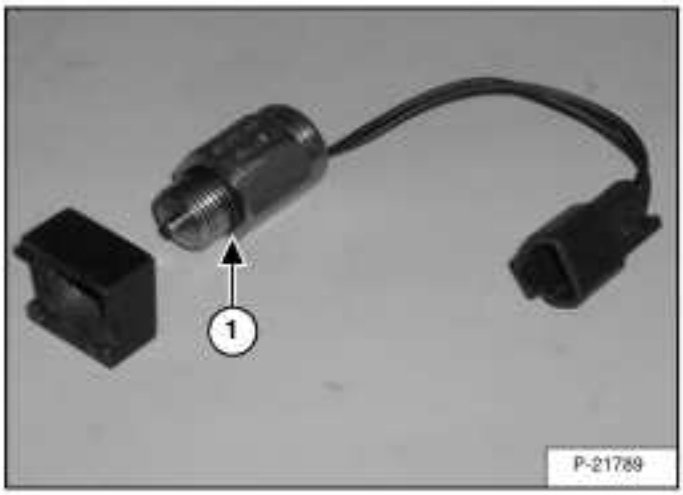
**Figure 60-130-26**




Remove solenoid (Item 1) from the solenoid mount (Item 2) **[Figure 60-130-26]**.

***Installation:*** Apply a drop of oil to the solenoid threads and tighten solenoid to 35-40 ft.-lb. (47-54 N•m) lubed torque.

**Figure 60-130-27**




Check the O-ring (Item 1) **[Figure 60-130-27]** for damage. Replace as necessary.



MidWestTech | Bobcat T190 Compact Track Skid Loader Service Manual | Publication 698... Order the manual at mid-west-tech.com >

***All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parentheses.***

**Torque Values**

| Thread Size (Dia. x Pitch) | Material | | |
|---|---|---|---|
| | **Head Mark 4** | **Head Mark 7** | **Head Mark 10** |
| M5 x 0.8 | | 3-4 ft.-lb. (4-5 N•m) | |
| M6 x 1.0 | | 6-7 ft.-lb. (8-9 N•m) | 6-9 ft.-lb. (8-12 N•m) |
| M8 x 1.25 | 6-9 ft.-lb. (8-12 N•m) | 11-16 ft.-lb. (15-22 N•m) | 18-25 ft.-lb. (24-34 N•m) |
| M10 x 1.25 | 13-18 ft.-lb. (18-24 N•m) | 22-30 ft.-lb. (30-41 N•m) | 36-50 ft.-lb. (49-68 N•m) |
| M12 x 1.25 | 22-30 ft.-lb. (30-41 N•m) | 40-54 ft.-lb. (54-73 N•m) | 69-87 ft.-lb. (94-118 N•m) |
| M14 x 1.5 | 36-50 ft.-lbs (49-68 N•m) | 58-80 ft.-lb. (79-108 N•m) | 116-137 ft.-lb. (157-186 N•m) |

**Troubleshooting**

The following troubleshooting chart is provided for assistance in locating and correcting problems which are most common. Many of the recommended procedures must be done by authorized Bobcat Service Personnel only.

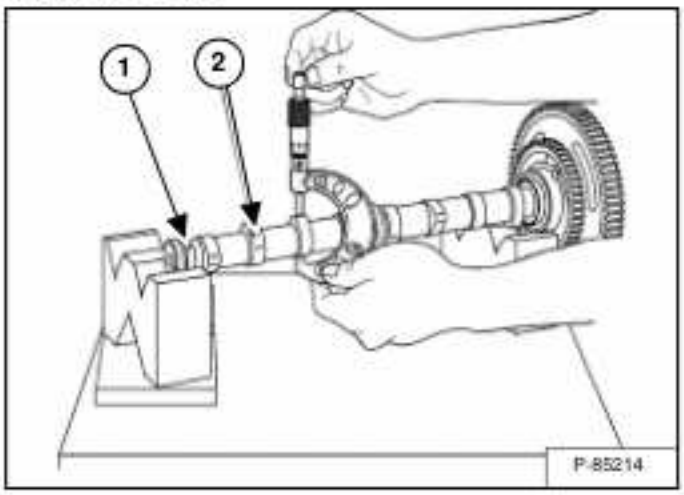
| PROBLEM | CAUSE |
|---|---|
| Slow cranking speed. | 1, 2, 3, 54 |
| Engine will not start. | 2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 19, 27, 28, 29 |
| Difficult to start. | 1, 2, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 25, 27, 28, 29,54 |
| No power for engine. | 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 20, 21, 22, 23, 27, 28, 29 |
| Engine is mis-firing. | 8, 9, 11, 12, 13, 15, 16, 17, 21, 22, 24, 25, 26, 28 |
| Too much fuel consumption. | 10, 12, 13, 15, 16, 17, 19, 20, 21, 23, 24, 25, 27, 28, 29 |
| Black exhaust. | 10, 12, 13, 15, 16, 17, 19, 20, 21, 23, 24, 25, 27, 28, 29 |
| Blue/white exhaust. | 4, 10, 15, 16, 17, 21, 23, 27, 29, 30, 50 |
| Low oil pressure. | 4, 31, 32, 33, 34, 35, 37, 38, 39, 52 |
| Engine knocking. | 13, 15, 16, 19, 22, 24, 25, 27, 29, 31, 40, 41, 53 |
| Engine running rough. | 7, 8, 9, 10, 11, 12, 13, 17, 18, 22, 24, 25, 26, 29, 40, 53 |
| Vibration. | 12, 13, 17, 21, 22, 25, 26, 29, 40, 42, 43 |
| High oil pressure warning. | 4, 33, 36 |
| Overheating. | 10, 12, 13, 15, 16, 20, 21, 40, 44, 45, 46, 47, 48, 51 |
| Too much crankcase pressure. | 22, 27, 29, 30, 40, 49 |
| Poor compression. | 10, 16, 21, 24, 25, 27, 28, 29, 30, 41, 53 |
| Start and stop. | 9, 10, 11 |



MidWestTech | Bobcat T190 Compact Track Skid Loader Service Manual | Publication 698... Order the manual at mid-west-tech.com >

### Camshaft - Servicing (Cont'd)

**Figure 70-100-14**

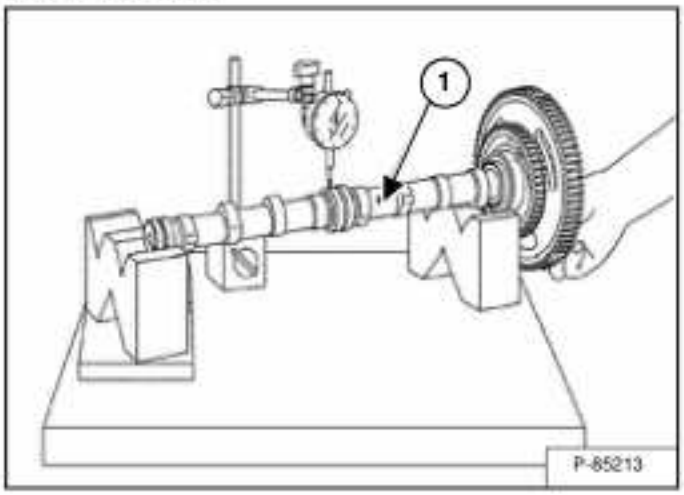



Measure the cam lobes at their highest point (Item 2) **[Figure 70-100-14]**.

If the measurement is less than the allowable limit, replace the camshaft (Item 1) **[Figure 70-100-14]**.

| | |
|---|---|
| Cam Lobe Height Intake | 1.282 in. (32,56 mm) |
| Cam Lobe Height Exhaust | 1.299 in. (33,00 mm) |
| Allowable Limit Intake | 1.264 in. (32,10 mm) |
| Allowable Limit Exhaust | 1.280 in. (32,50 mm) |

**Figure 70-100-15**



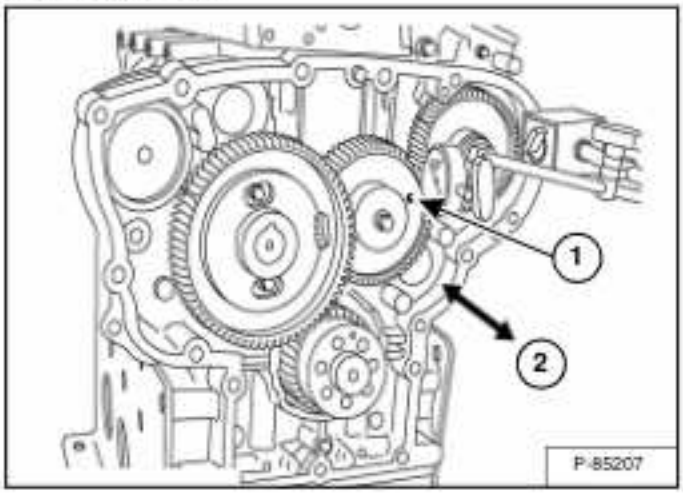

Put the camshaft (Item 1) in V-blocks. Install a dial indicator **[Figure 70-100-15]**.

Turn the camshaft at a slow rate. If the misalignment exceeds the allowable limit, replace the camshaft.

| | |
|---|---|
| Camshaft Alignment Allowable Limit | 0.0004 in. (0,01 mm) |

### Idler Gear And Shaft - Servicing

**Figure 70-100-16**




Mount a dial indicator and check idle gear (Item 1) end play (Item 2) **[Figure 70-100-16]**.

***Installation:*** Check the idler gear end play. If the clearance exceeds the allowable limit, replace the gear collar.

| | |
|---|---|
| Idler Gear End Play | 0.0020 - 0.0078 in. (0,050 - 0,020 mm) |
| Allowable Limit | 0.035 in. (0,90 mm) |

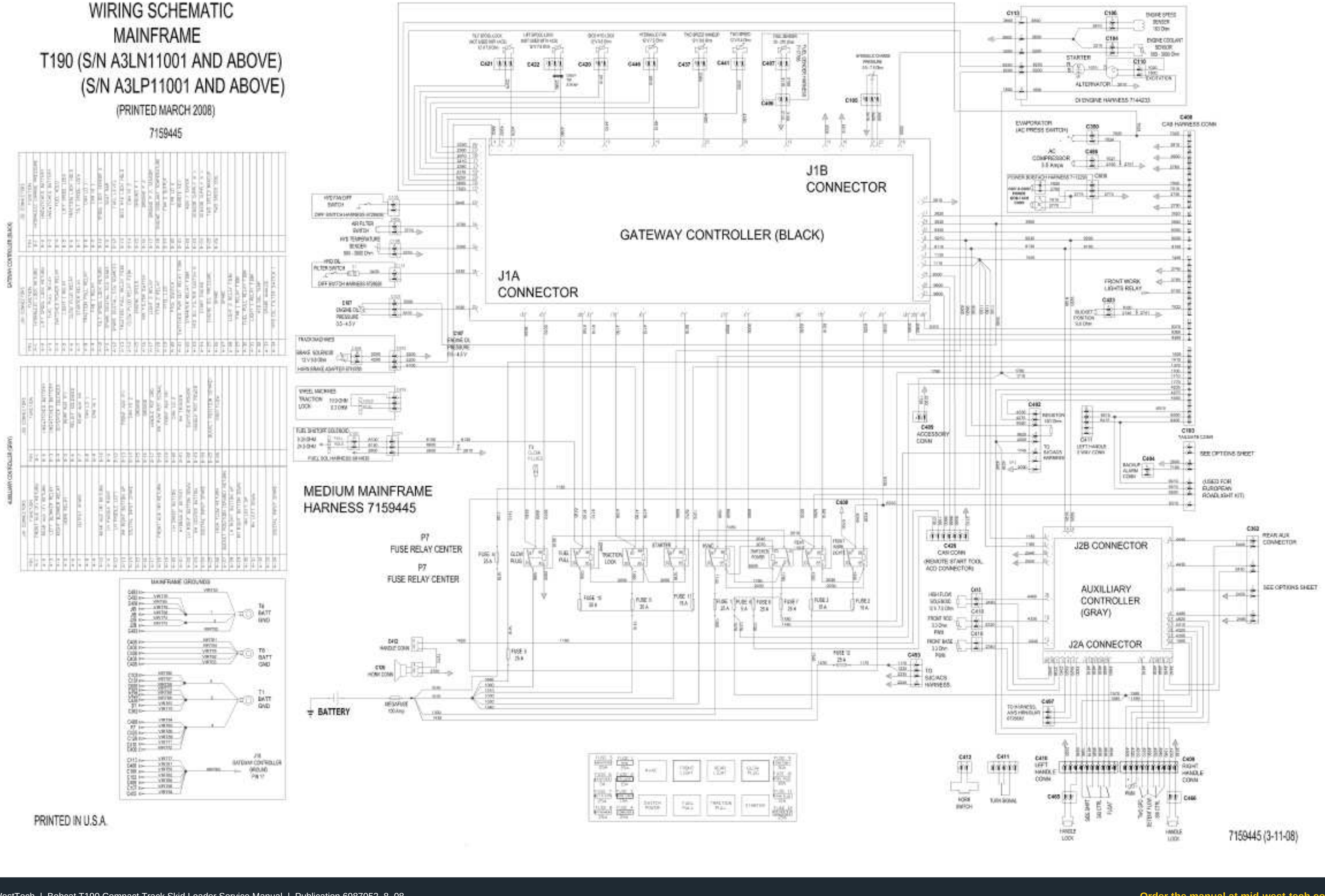


MidWestTech | Bobcat T190 Compact Track Skid Loader Service Manual | Publication 698... Order the manual at mid-west-tech.com >

# WIRING SCHEMATIC
# MAINFRAME
# T190 (S/N A3LN11001 AND ABOVE)
# (S/N A3LP11001 AND ABOVE)

(PRINTED MARCH 2008)

7159445




PRINTED IN U.S.A.

7159445 (3-11-08)



Order the manual at mid-west-tech.com >