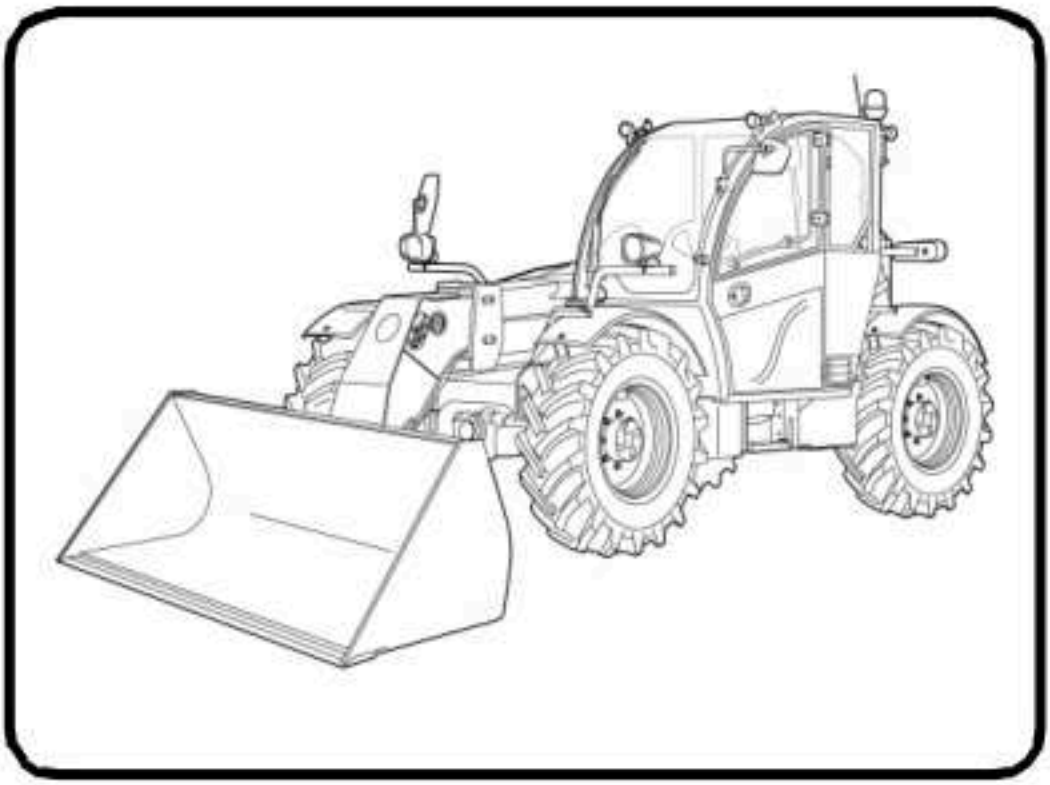
Bobcat®

Service Manual
TL470(X) Telescopic Handler

S/N ANL711001 & Above
S/N ANMG11001 & Above



6990103 (05-11)

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CONTENTS

SAFETY & MAINTENANCE 10-01

HYDRAULIC SYSTEM 20-01

HYDROSTATIC SYSTEM 30-01

DRIVE SYSTEM 40-01

MAINFRAME 50-01

ELECTRICAL SYSTEM AND ANALYSIS 60-01

ENGINE SERVICE 70-01

HEATING, VENTILATION, AIR CONDITIONING (HVAC) 80-01

SPECIFICATIONS SPEC-01

ALPHABETICAL INDEX INDEX-01

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FOREWORD 1-7

SAFETY INSTRUCTIONS 1-9
Safe Operation Is The Operator's Responsibility 1-9
Safe Operation Needs A Qualified Operator 1-9
Avoid Silica Dust 1-10

FIRE PREVENTION 1-10
Maintenance 1-10
Operation 1-10
Electrical 1-10
Hydraulic System 1-11
Fueling 1-11
Starting 1-11
Welding And Grinding 1-11
Fire Extinguishers 1-11

SERIAL NUMBER LOCATION 1-12
Telescopic Handler Serial Number 1-12
Engine Serial Number 1-13
Other Serial Numbers 1-13

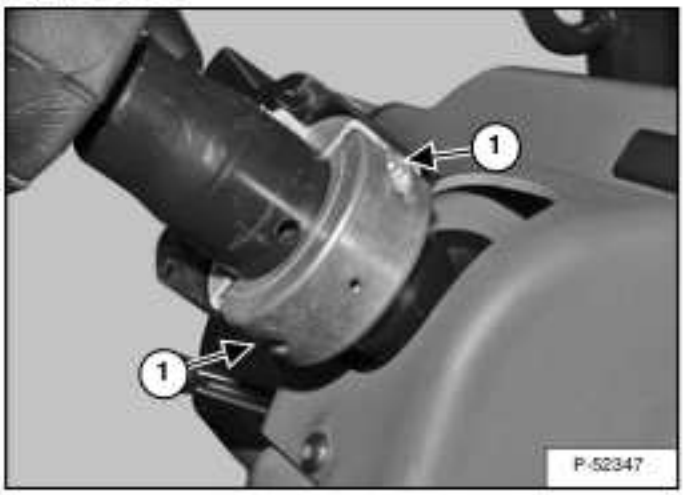
DELIVERY REPORT 1-13

BOBCAT TELESCOPIC HANDLER IDENTIFICATION 1-14

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Removal And Installation (Cont'd)

Figure 60-60-5



Remove the two screws (Item 1) **[Figure 60-60-5]** from the signal lever.

Route the harness out of the cowling and remove the signal lever.

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Specifications (Cont'd)

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

Oil Pump, Gear And Relief Valve

Type of Oil Pump	Gear Driven, Differential Rotor
Number Of Lobes	Inner 5, Outer 6
Clearance Of Outer Rotor To Body	0,15 - 0,34 (0.006 - 0.013)
End Play	
Inner Rotor	0,04 - 0,09 (0.001 - 0.004)
Outer Rotor	0,025 - 0,076 (0.0010 - 0.0029)
Oil Pump Idler Gear Bushing I.D.	16,012 - 16,038 (0.6303 - 0.6314)
Idler Shaft O.D.	15,966 - 15,984 (0.6285 - 0.5292)
Idler Gear Shaft Bushing Clearance	0,028 - 0,072 (0.0011 - 0.0028)
Oil Pump Idler Gear End Play	0,050 - 0,275 (0.0019 - 0.0108)
Relief Valve Plunger Bore Diameter	19,250 - 19,300 (0.7578 - 0.7598)
Relief Valve Plunger Outside Diameter	19,186 - 19,211 (0.7553 - 0.7563)
Clearance	0,039 - 0,114 (0.0015 - 0.0044)
Length Of The Spring (Installed)	59,8 (2.35)
Load On The Spring (Installed)	25 - 36 kPa (0,25 - 0,36 bar) (3.6 - 5.2 psi)
Pressure To Open Pressure Relief Valve	414 - 469 kPa (4,14 - 4,69 bar) (60 - 68 psi)
Oil Filter Type	Full Flow Screw-on Type Canister
Pressure To Open Bypass Valve In Oil Filter	55 - 83 kPa (0,55 - 0,83 bar) (8 - 12 psi)

Turbocharger

Type	Garrett GT25

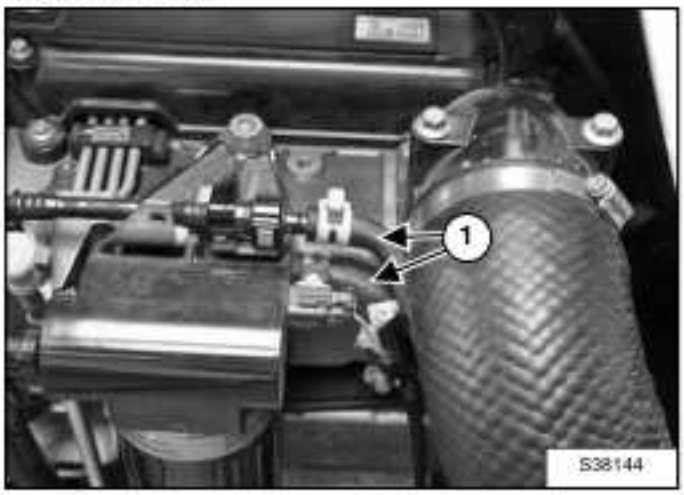
Flywheel

Run-Out	Less than 0,30 (0.012)
Misalignment	0,03 (0.001) @ 25 (1.0)

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Removal And Installation (Cont'd)

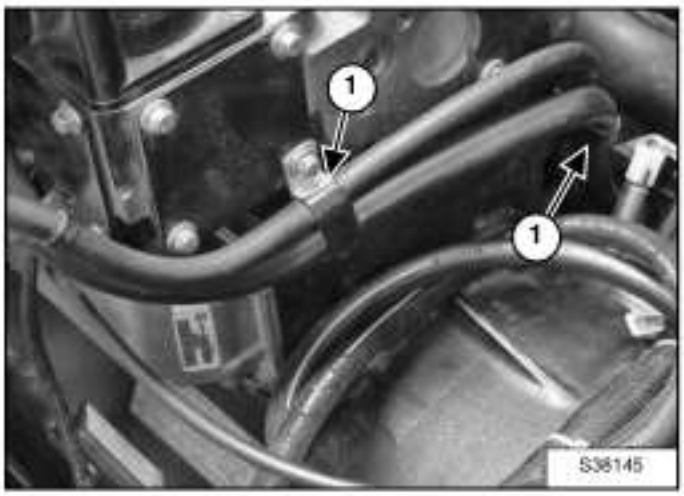
Figure 70-100-16



Remove the two fuel hoses (Item 1) **[Figure 70-100-16]**.

NOTE: Mark the hoses for proper assembly.

Figure 70-100-17

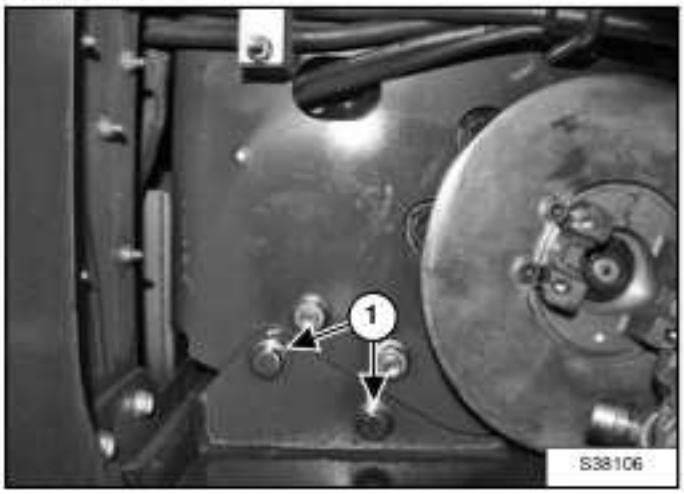


Remove the hose clamps (Item 1) **[Figure 70-100-17]**.

Support the engine / hydrostat assembly with a fork lift or suitable lift jack.

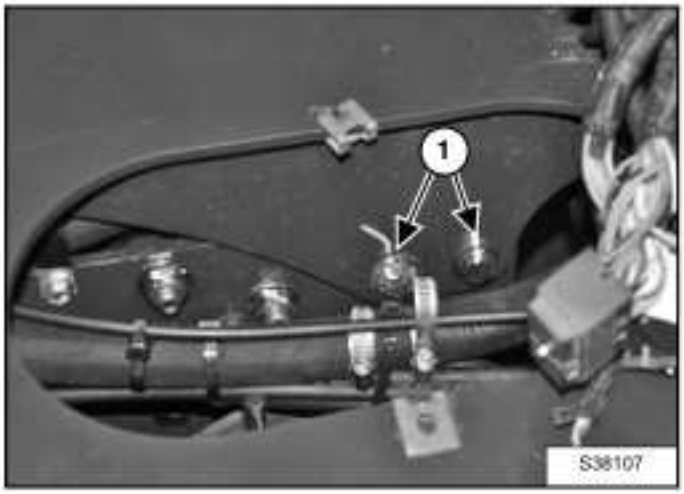
NOTE: Make sure the fork tips of the fork lift only support the engine / hydrostat assembly and not the machine frame.

Figure 70-100-18



Remove the two mounting bolts (Item 1) **[Figure 70-100-18]** located inside the front frame compartment.

Figure 70-100-19



Remove the two mounting bolts (Item 1) **[Figure 70-100-19]** located inside the front frame compartment.

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ENGINE CONNECTORS ASSIGNMENT

CONNECTOR	DESCRIPTION	PINS	SHEET
C100	ENGINE TO FRAME	29	9, 11,12,13
C103	FUEL PUMP	2	8
C104	INJECTION CONTROLLER (130HP)	2	8
C105	FUEL SOLENOID	2	8
C109	ELECTRONIC BATTERY DISC.	2	5
C110	ALTERNATOR	2	8
C113	GLOW PLUGS	1	8
C115	VARIABLE FAN SPEED	2	8
C116	FAN INVERTER	2	8
C117	SWASH PLATE SENSOR	4	11
C120	DRIVE PUMP FORWARD	2	11
C121	DRIVE PUMP REVERSE	2	11
C123	AC COMPRESSOR CLUTCH	2	9
C125	ICVD SWASH PLATE VALVE	2	11
C126	ICVD DEFEAT VALVE	2	11
C130	LOW SPEED	2	11
C135	DUMP VALVE	2	11
C141	1ST/2ND GEAR SWITH	2	11
C142	SERVO PRESSURE SENSOR	3	11
C143	STEERING PRESSURE SENSOR	3	13
C144	INLET PRESSURE SENSOR	3	14
C150	TRACTOR TRAILER BRAKE VALVE	2	12
C158	ENGINE OIL PRESSURE	2	8
C233	ENGINE TO CAB	24	5,7,8,9
C235	IGNITION TO CAB	1	5
T1	MEGAFUSE F50	1	5
T2	MEGAFUSE F50	1	5
T5	GLOW PLUGS RELAY	1	8
T6	GLOW PLUGS RELAY	1	8
T7	GLOW PLUGS RELAY	1	8
T8	GLOW PLUGS RELAY	1	8
T10	ELECTRONIC BATTERY DISC.	1	5
T11	ELECTRONIC BATTERY DISC.	1	5
T12	ELECTRONIC BATTERY DISC.	1	5
T13	ELECTRONIC BATTERY DISC.		
T16	ALTERNATOR B+	1	8
T17	ALTERNATOR GND	1	8
T18	STARTER B	1	8
T19	STARTER TO MEGAFUSE	1	8
T20	STARTER S	1	8
T23	ENGINE GND	1	8
T24	ENGINE GND	1	8
T30	BATTERY POSITIVE	1	5
T31	BATTERY NEGATIVE	1	5
T44	ENGINE SPEED SENSOR	1	8
T45	ENGINE SPEED SENSOR	1	8
T55	ENGINE COOLANT TEMPERATURE	1	9
T56	ENGINE COOLANT TEMPERATURE	1	8

FRAME CONNECTORS ASSIGNMENT

CONNECTOR	DESCRIPTION	PINS	SHEET
C100	FRAME TO ENGINE	29	9,11,12, 13
C230	FRAME TO CAB	40	7,11,12, 13, 14,15, 16,17,18
C236	FRAME LVL TO CAB	8	15
C400	HYDRAULIC OIL TEMPERATURE	2	14
C401	BACKUP ALARM	2	17
C402	GEAR 1 VALVE	2	11
C403	GEAR 2 VALVE	2	11
C412	BOOM UP	2	14
C413	BOOM DOWN	2	14
C414	TILT UP	2	14
C415	TILT DOWN	2	14
C416	BOOM EXTEND	2	14
C417	BOOM RETRACT	2	14
C418	AUX A4 VALVE	2	14
C419	AUX B4 VALVE	2	14
C420	RETRACT SWITCH	4	14
C421	CRAB STEER VALVE	2	13
C422	4 WHEEL STEER	2	13
C423	SAFETY VALVE	2	11
C424	HORN	2	9
C425	STEERING PRESS. SENSOR LS PUMP	3	13
C426	PASSIVE BRAKE VALVE	2	12
C429	ITALIAN TRAILER BRAKE VALVE	2	12
C431	REAR DIVERTER 1	2	16
C432	REAR DIVERTER 2	2	16
C433	FRAME TO BOOM ACD	8	7,14
C435	FRONT/REAR DIVERTER SWITCH	2	16
C436	BOOM ANGLE SENSOR	8	14
C441	1ST/2ND GEAR SWITCH	2	13
C444	FRAME LEVELING 1	2	15
C445	FRAME LEVELING 2	2	15
C451	REAR SHAFT SPEED SENSOR	2	11
C452	REAR WHEELS ALLIGNMENT	3	13
C453	FRONT WHEELS ALLIGNMENT	3	13
C455	SERVICE BRAKE PRESSURE SENSOR	3	12
C456	PARK BRAKE PRESSUE SWITCH	2	12
C457	ITALIAN BRAKE PRESSURE SWITCH	2	12
C458	ICVD MOTOR RMP	2	11
C460	HYDRAULIC QUICTACH VALVE	2	16
C467	TRAILER PRESSURE RELEASE SWITCH	10	12
C700	FRAME TO BOOM VALVES OPT.	8	16
T35	FRAME GND	1	6
T80	HYDRAULIC FILER 1 (CLOGGING INDICATOR 1)	1	14
T81	HYDRAULIC FILER 1 (CLOGGING INDICATOR 1)	1	14
T82	HYDRAULIC FILER 2 (CLOGGING INDICATOR 2)	1	14
T83	HYDRAULIC FILER 2 (CLOGGING INDICATOR 2)	1	14

CAB CONNECTORS ASSIGNMENT

CONNECTOR	DESCRIPTION	PINS	SHEET
C200	ICON DISPLAY CLUSTER	8	13,15,17
C205	REAR AUX/HYD HOOK SWITCH	10	16
C209	DRIVE MODE SWITCH	5	11
C210	IGNITION KEY SWITCH	8	8
C211	AC SWITCH	3	9
C212	BLOWER SPEED SWITCH	5	9
C213	HEATER AND BLOWER MOTOR	5	9
C214	THERMOSTAT MODULE	3	9
C216	FAN INVERTER SWITCH	10	8
C217	BOOM SUSPENSION SWITCH	10	16
C219	GEAR SELECT SWITCH	10	11
C220	KEYLESS MODULE (RSS)	6	8
C221	FLASHER RELAY	6	17
C222	THROTTLE PEDAL SENSOR		
C224	LEFT LEVER	12	8,11,17
C225	FNR LEVER	6	11
C227	12V SOCKET	2	9
C229	CAB TO LLMI SENSOR	8	7, 15
C230	CAB TO FRAME	40	7,11,12, 12,14,15, 16,17,18
C232	CAB TO UPPER CAB	4	5,10,18
C233	CAB TO ENGINE	24	5,7,8,9
C235	CAB TO IGNITION	1	5
C236	CAB TO FRAME LVL	8	15
C237	LLMI	6	15
C238	LLMC	6	15
C240	DISPLAY (BLACK CONNECTOR)	12	7,9,13,17
C241	DISPLAY (GRAY CONNECTOR)	12	8
C242	WIPER SWITCH	10	9
C243	FUEL LEVEL SENSOR	2	9
C244	CAB TO FUEL LEVEL SENSOR	3	9
C247	LLMI TO SENSOR	4	15
C248	LLMC TO SENSOR	4	15
C250	KEYLESS PAD	8	8
C251	BRAKE INCHING POTENTIOMETER	3	11
C254	CREEP ENABLE SWITCH	10	11
C255	FRAME LEVELING POTENTIOMETER	3	15
C256	JOYSTICK	4	7, 14
C257	LH SKI SWITCH	10	16
C258	ATACH SKI SWITCH	10	16
C259	RH SKI SWITCH	10	16
C260	STEER MODE SWITCH	10	13
C265	FRONT WASHER MOTOR	2	9
C267	WASHER SWITCH	10	9
C270	WARNING SWITCH	10	17
C272	FOG LIGHT SWITCH	10	17

CAB CONNECTORS ASSIGNMENT

CONNECTOR	DESCRIPTION	PINS	SHEET
C280	SUSPENSION SEAT MOTOR	2	9
C281	FRONT WIPER MOTOR	6	9
C284	HYDRAULIC QUICKTACH SWITCH	10	16
C286	PARK BRAKE SWITCH	10	12
C290	DIAGNOSTIC CONNETCOR	7	18
T26	LOWER CAB GND	1	6
T50	AC PRESSURE SWITCH	1	9
T51	AC PRESSURE SWITCH	1	9
T59	CAB BUZZER	1	9
T60	CAB BUZZER	1	9
T68	SHUNT KEY	1	15
T69	SHUNT KEY	1	15
T90	BRAKE FAIL PRESSURE LAMP	1	12
T91	BRAKE FAIL PRESSURE LAMP	1	12
T92	TRAILER INDICATOR LAMP	1	17
T93	TRAILER INDICATOR LAMP	1	17
T94	CRAB STEER LAMP	1	13
T95	CRAB STEER LAMP	1	13
T96	4 WHEEL STEER LAMP	1	13
T97	4 WHEEL STEER LAMP	1	13
C601	REAR WIPER MOTOR	2	10
C602	ROOF WIPER MOTOR	3	10
C603	CAR RADIO SUPPLY	8	10
C604	CAR RADIO SPEAKERS	8	10
C605	FRONT LEFT WORK LIGHT	2	18
C606	FRONT RIGHT WORK LIGHT	2	18
C607	REAR WORK LIGHT	2	28
C608	DOME LIGHT	3	20
C620	ROOF WIPER SWITCH	10	10
C621	BEACON SWITCH	10	10
T32	UPPER CAB GND	1	6
T78	BEACON	1	10
T79	BEACON	1	10
T84	SPEAKER RIGHT	1	10
T85	SPEAKER RIGHT	1	10
T86	SPEAKER LEFT	1	10
T87	SPEAKER LEFT	1	10

LIGHTS CONNECTORS ASSIGNMENT

CONNECTOR	DESCRIPTION	PINS	SHEET
C302	FRONT LIGHTS LEFT	6	17
C303	REAR LIGHTS LEFT	6	17
C304	FRONT LIGHTS RIGHT	6	17
C305	REAR LIGHTS RIGHT	6	17
C306	LICENSE PLATE LIGHT	2	17
C332	LIGHTS TO BOOM	2	18
C333	FRAME TO BLUE LIGHT LEFT	2	18
C334	FRAME TO BLUE LIGHT RIGHT	2	18
T70	BLUE WORK LIGHT LEFT	1	18
T71	BLUE WORK LIGHT LEFT	1	18
T72	BLUE WORK LIGHT RIGHT	1	18
T73	BLUE WORK LIGHT RIGHT	1	18
T76	REVERSE LIGHT	1	17
T77	REVERSE LIGHT	1	17

BOOM CONNECTORS ASSIGNMENT

CONNECTOR	DESCRIPTION	PINS	SHEET
C433	BOOM ACD TO FRAME	8	7, 14
C501	ACD CONNECTOR	7	14
C504	BOOM WORK LIGHT LEFT	2	18
C505	BOOM WORK LIGHT RIGHT	2	18
C700	BOOM VALVES OPT. TO FRAME	8	16
C701	BOOM OPTION VALVE 1	2	16
C702	BOOM OPTION VALVE 2	2	16
C703	BOOM OPTION PRESS. SENSOR 1	2	16
C704	BOOM OPTION PRESS. SENSOR 2	2	16

WIRING SCHEMATIC

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Sheet 2 of 18

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