

INTRODUCTION

With correct maintenance and proper use, the Gehl R190, R220, R260 and Mustang 1900R, 2200R and 2600R skid-steer loaders will give years of dependable service. This service manual is intended to be a guide in the assembly and disassembly, installation and removal, adjustment and testing, troubleshooting and replacement of components that together make up the Gehl and Mustang R-Series skid-steer loaders.

In many of the procedures found within, the installation steps are the exact opposite of the removal steps, and therefore the opposite procedure is not written. Instead, a note to reverse the procedure is stated. This reduces redundancy and excessive pages in the manual. In cases though, where the assembly and disassembly or removal and installation procedures differ, and additional steps or safety concerns are paramount, the entire reverse procedure is written to include the additional information.

The Table of Contents and the Index can be used to make finding a procedure easier. Many schematics, photographs and line art drawings are used to help perform the necessary repairs, tests and adjustments that the skid-steer loader needs to keep it in good running condition.

If you have any questions, please contact your authorized Gehl or Mustang dealer, or call the Gehl and Mustang Service Department for assistance.

TABLE OF CONTENTS

Specifications	Page
SPECIFICATIONS.....	1

Safety	Page
General Information	7
Signal Words.....	7
Additional Safety Reminders	7
Mandatory Safety Shutdown Procedure.....	9
Lift Arm Support Device	9
Lift Arm Support Device Engagement.....	9
Lift Arm Support Device Disengagement	10
ROPS/FOPS – Raising	10
ROPS/FOPS – Lowering	11
Relieving Hydraulic Pressure - T-Bar Controls - Lift/Tilt/Auxiliary	11
Relieving Hydraulic Pressure - Dual Joystick, Dual Hand and Hand/Foot Controls - Lift/Tilt/Auxiliary	12
Loader Raising Procedure	13
Loader Lowering Procedure.....	13

Lubrication	Page
General Information	15
Hydraulic Oil Reservoir	15
Crankcase Oil	16
Chaincases	17
Grease Fitting Locations.....	18
Cooling System Drain Procedure	19

Mainframe	Page
Introduction 21	
Mainframe (Chassis) Components - R190/1900R Models.....	21
Mainframe (Chassis) Components - R220/2200R Models.....	22
Mainframe (Chassis) Components - R260/2600R Models.....	23
Grille and Engine Cover Components	24
Engine Access Cover - Removal and Installation	25
Roll-Over and Falling Object Protective Structure Components - ROPS/FOPS	26
ROPS/FOPS Removal and Installation	27
Seat Removal and Installation	28
Seat Slide Replacement	29
Side Console Removal and Installation	29
Non-HVAC Assembly - ROPS/FOPS	30
HVAC Assembly - ROPS/FOPS	31
Heater-Only Assembly - ROPS/FOPS	32
Air Duct Louver Replacement	33

ROPS/FOPS Rear Window Removal and Installation	33
Restraint Bar Components	35
Restraint Bar Removal and Installation	36
All-Tach® Hitch Components - R190/1900R Models	37
Actuator Group Components - All-Tach® Hitch - R190/1900R Models	37
All-Tach® Hitch Components - R220/R260/2200R/2600R Models	38
Actuator Group Components - All-Tach® Hitch - R220/R260/2200R/2600R Models	38
Power-A-Tach® Components - R190 Models	39
Power-A-Tach® Components - 1900R Models	40
Power-A-Tach® Components - R220/R260 Models	41
Power-A-Tach® Components - 2200R/2600R Models	42
All-Tach® and Power-A-Tach® Hitch Removal and Installation	43
Lift Arm Components - R190 Models	45
Lift Arm Components - 1900R Models	46
Lift Arm Components - R220/R260 Models	47
Lift Arm Components - 2200R/2600R Models	48
Lift Arm Removal and Installation	49
Lift Arm Bushing Replacement	52
Lift Arm Stop Installation and Adjustment	53
Control Console Removal and Installation	53
Clean-Out Cover, Floor Plate and Kickplate Cover Removal and Installation	55
Crossmember Removal and Installation	56
Hydraulic Oil Reservoir Removal and Installation	59
Fuel Sensor Removal and Installation	60
Rear Grille Removal and Installation	61
Rear Grille Latch Removal and Installation	62

Wheel Drives

Page

Introduction	63
Wheel Drive Components - R190/1900R Models	63
Wheel Drive Components - R220/R260/2200R/2600R Models	64
Drive Chain Adjustment	65
Axle Housing Assembly Removal and Installation	66
Axle Assembly Components - R220/R260/2200R/2600R Models	68
Axle Assembly Components - R190/1900R Models	69
Drive Chain Removal and Installation	70
Axle and Wheel Bearing Disassembly and Assembly	71

Controls

Page

Introduction	75
Control Locations - Dual Joystick, Dual Hand and Hand/Foot Controls	76
Control Locations - T-Bar Controls	76
Wheel Drive - Lift/Tilt Components - T-Bar Controls - R190/R220/R260 Models	77
Wheel Drive - Lift/Tilt Components - Hand/Foot Controls - R190/R220/1900R/2200R Models	78
Wheel Drive - Lift/Tilt Components - Hand/Foot Controls - R260/2600R Models	79
Wheel Drive - Lift/Tilt Components - Dual Joystick Controls - R190/R220/1900R/2200R Models	80
Wheel Drive - Lift/Tilt Components - Dual Joystick Controls - R260/2600R Models	81
Wheel Drive - Lift/Tilt Components - Dual Hand Controls - R190/R220/1900R/2200R Models	82
Wheel Drive - Lift/Tilt Components - Dual Hand Controls - R260/2600R Models	83

Control Handle Assembly (Both Control Handles) Removal and Installation.	84
Control Handle Removal and Installation - Electrical Auxiliary Grip - Dual Joystick, Dual Hand and Hand/Foot Controls.	84
Control Handle Removal and Installation - T-Bar Controls.	86
T-Bar Control Handle Assembly	87
Dual Joystick, Dual Hand and Hand/Foot Control Handle Assembly	89
Pivot Tube Removal and Installation, Disassembly and Assembly - T-Bar Controls	91
Control Handle Position Adjustment - T-Bar Controls	93
Control Handle Tracking Adjustment.	93
Neutral Centering Test and Adjustment	95
Lift/Tilt Control Removal and Installation	97
Lift/Tilt Control Adjustment - T-Bar Controls	99
Electrical Foot Throttle Components - Dual Joystick and T-Bar Controls.	100
Electrical Foot Throttle Removal and Installation - T-Bar, Dual Hand and Dual Joystick Controls	101

Hydrostatic System

Page

Introduction 103	
Hydrostatic Components - Single-Speed - R190 T-Bar Controls.	103
Hydrostatic Components - Two-Speed - R190 T-Bar Controls	104
Hydrostatic Components - Single-Speed - R190/1900R H/F, DH and DJS Controls	105
Hydrostatic Components - Two-Speed - R190/1900R H/F, DH AND DJS Controls	106
Hydrostatic Components - Single-Speed - R220/R260 T-Bar Controls.	107
Hydrostatic Components - Two-Speed - R220/R260 T-Bar Controls	108
Hydrostatic Components - Single-Speed - R220/R260/2200R/2600R H/F, DH & DJS Controls	109
Hydrostatic Components - Two-Speed - R220/R260/2200R/2600R H/F, DH & DJS Controls	110
Charge Pressure Test and Adjustment	111
Hydrostatic Pump Relief Valves.	112
Hydrostatic Pump Removal and Installation	112
Hydrostatic Pump Drive Coupling Removal and Installation	114
Drive Motor Removal and Installation.	115
Troubleshooting Guide	117
Hydrostatic/Hydraulic Schematic - Dual Joystick/Dual Hand Controls	121
Hydrostatic/Hydraulic Schematic - Hand/Foot Controls	122
Hydrostatic/Hydraulic Schematic - T-Bar Controls	123

Hydraulic System

Page

Introduction.	125
Troubleshooting Guide	125
Hydraulics - Tank Hydraulic Components - R190 and 1900R Models	130
Hydraulics - Tank Hydraulic Components - R220/R260 and 2200R/2600R Models	131
Hydraulics - Hydraglide Ride Control Components	132
Hydraulics - Standard Auxiliary Components - R190/1900R Hand/Foot and Dual Joystick	133
Hydraulics - Standard Auxiliary Components - R190/1900R Dual Hand	134
Hydraulics - Standard Auxiliary Components - R190 T-Bar	135
Hydraulics - Standard Auxiliary Components - R220/2200R Hand/Foot and Dual Joystick	136
Hydraulics - Standard Auxiliary Components - R220/2200R Dual Hand	137
Hydraulics - Standard Auxiliary Components - R220 T-Bar	138
Hydraulics - Standard Auxiliary Components - R260/2600R Hand/Foot and Dual Joystick	139
Hydraulics - Standard Auxiliary Components - R260/2600R Dual Hand	140

Hydraulics - Standard Auxiliary Components - R260 T-Bar	141
Hydraulics - High-Flow Auxiliary Components - R190/1900R Dual Joystick and Hand/Foot	142
Hydraulics - High-Flow Auxiliary Components - R190 T-Bar	143
Hydraulics - High-Flow Auxiliary Components - R190/1900R Dual Hand	144
Hydraulics - High-Flow Auxiliary Components - R220/2200R Hand/Foot and Dual Joystick	145
Hydraulics - High-Flow Auxiliary Components - R220/2200R Dual Hand	146
Hydraulics - High-Flow Auxiliary Components - R220 T-Bar	147
Hydraulics - High-Flow Auxiliary Components - R260/2600R Hand/Foot and Dual Joystick	148
Hydraulics - High-Flow Auxiliary Components - R260/2600R Dual Hand	149
Hydraulics - High-Flow Auxiliary Components - R260 T-Bar	150
Hydraulics - Self-Leveling Components - R190 T-Bar	151
Hydraulics - Self-Leveling Components - R220 T-Bar	152
Hydraulics - Self-Leveling Components - R260 T-Bar	153
Hydraulics - Non-Self-Leveling Components - R190 T-Bar	154
Hydraulics - Non-Self-Leveling Components - R220 T-Bar	155
Hydraulics - Non-Self-Leveling Components - R260 T-Bar	156
Hydraulics - Self-Leveling Components - All Models - Hand/Foot and Dual Joystick	157
Hydraulics - Non-Self-Leveling Components - All Models - Hand/Foot and Dual Joystick	158
Hydraulics - Standard Auxiliary Lift Arm Components - R190	159
Hydraulics - Standard Auxiliary Lift Arm Components - 1900R	160
Hydraulics - Standard Auxiliary Lift Arm Components - R220/R260	161
Hydraulics - Standard Auxiliary Lift Arm Components - 2200R/2600R	162
Hydraulics - High-Flow Auxiliary Lift Arm Components - R190	163
Hydraulics - High-Flow Auxiliary Lift Arm Components - 1900R	164
Hydraulics - High-Flow Auxiliary Lift Arm Components - R220/R260	165
Hydraulics - High-Flow Auxiliary Lift Arm Components - 2200R/2600R	166
Hydraulics - Power-A-Tach® Components - All Models	167
Pressure Check, Test and Adjustment	168
Tilt Cylinder Test	169
Tilt Circuit Spool Leakage Test	170
Self-Leveling Valve Test	171
Lift Cylinder Test	171
Lift Circuit Spool Leakage Test	172
Solenoid Valve Test - Lift Arm Pilot Supply, Joystick Drive Supply, Power-A-Tach, Brake/Two-Speed, Safety Locks and Ride Control	173
Hydraulic Oil Filter Element Replacement	176
Lift Cylinder Components - R190/1990R	177
Tilt Cylinder Components - R190/1900R	177
Lift Cylinder Components - R220/R260/2200R/2600R	178
Tilt Cylinder Components - R220/R260/2200R/2600R	178
Tilt Cylinder Removal and Installation	179
Lift Cylinder Removal and Installation	181
Lift/Tilt Cylinder Disassembly / Assembly	182
Auxiliary Pump Removal and Installation	184
Self-Leveling Valve (Optional) Removal and Installation	185
Self-Leveling Valve Adjustment	187
Brake/Two-Speed, Lift Arm Pilot Supply and Safety Lock Solenoid Valves - Removal and Installation	188
Joystick Drive Supply, Power-A-Tach and Hydraglide™ Ride Control Solenoid Valves - Removal and Installation	189
Lift/Tilt, Joystick Drive Supply, Brake/Two-Speed, All-Tach/Fan and Hydraglide™ Ride Control Solenoid Valves - Disassembly and Assembly	191
Main Control Valve Components - Standard	192
Main Control Valve Components - High-Flow	193

Control Valve Removal and Installation	194
Control Valve Disassembly and Assembly	196
Control Valve Solenoid Removal and Installation	197
Inlet Relief Valve, Port Relief Valve and High-Flow Relief Valve Removal and Installation	198
Hydraulic Oil Reservoir Removal and Installation	199
Hydraglide™ Ride Control Accumulator Removal and Installation	200

Electrical System

Page

Introduction	203
Description of Operation - Right and Left Instrument Panels	203
Troubleshooting Guide	206
Electrical Chassis Components	208
Electrical Chassis Components - Hydraglide™ Ride Control/Two Speed Components	209
Electrical ROPS/FOPS Components	210
Power Distribution Module Test and Operation	211
Interlock Control Module Test	216
Interlock Control Module Truth Table - PN 137753 - Earlier Models	218
Interlock Control Module Truth Table - PN 50305144 - Later Models	219
Two-Speed, Ride Control and Float Module Test	220
Two-Speed, Ride Control and Float Module Truth Table	221
High-Flow Controller Module Test	222
Standard Auxiliary Flow Controller Module Test	223
Standard Auxiliary Flow Module Truth Table	224
Control Handle Actuation Buttons - Two-Speed and Ride Control and Float Module	225
Electrically-Controlled Standard Auxiliary Hydraulic Flow System Test and Operation	226
Engine Throttle Test and Operation	227
Seat Switch Removal and Installation	228
Electrical Lights Components	229
Restraint Bar Components	230
Restraint Bar Switch Removal and Installation	231
Master Disconnect Switch - Remote Battery Terminal Removal and Installation	232
Front and Rear Work Light Bulb Replacement	233
Dome Light Bulb Replacement	233
Information Center Electronic Display Removal and Installation	234
Information Center Electronic Display - The Display Modes	235
DPF (Diesel Particulate Filter) Regeneration	238
Regen Terms and Definitions	238
Stationary Regeneration Safety	239
Other Stationary Regeneration Topics	239
Stationary Regeneration Procedure	240
Stationary Regeneration Abort Procedure	240
DPF Regen Flowcharts Introduction	240
DPF Regen Flowcharts	241
Electrical Heater Schematic	244
Electrical HVAC Schematic	245
Electrical 14-Pin Auxiliary Schematic	246
Electrical Engine Schematic (DPF Models)	247
Electrical Engine Schematic (Non-DPF Models)	248
Electrical Chassis Schematic (DPF Models)	249
Electrical Chassis Schematic (Non-DPF Models)	250
Electrical ROPS/FOPS Schematic	251

Engine	Page
Introduction	253
Troubleshooting Guide	254
Engine Components - R190/1900R	256
Parts Listing for R190/1900R Engine Illustration On Previous Page	257
Engine Components - R220/R260/2200R/2600R	258
Parts Listing for R220/R260/2200R/2600R Engine Illustration On Previous Page	259
Air Cleaner and Exhaust Components - R190/1900R	260
Air Cleaner and Exhaust Components - R220/R20/2200R/2600R	261
Radiator/Cooler Components - R190/1900R	262
Radiator/Cooler Components - R220/R260/2200R/2600R	263
Oil Filter Element Removal and Installation	264
Air Cleaner Assembly Removal and Installation	265
Air Filter Element Removal and Installation	266
Battery and Battery Tray Removal and Installation	268
Starter Removal and Installation	269
Exhaust Pipe Removal and Installation	270
Alternator Belt Adjustment	270
Radiator/Cooler Removal and Installation	271
Fan Shroud and Mounting Plates Removal and Installation	273
Fan Adjustment	275
Fan Removal and Installation	276
Engine Removal and Installation	277
Engine Diagnostic Fault Codes	280
Yanmar 4TNV98C-CT/NMS/T4 Engine Diagnostic Fault Codes (DPF Models)	281
Yanmar 4TNV98ZNMS2R / T-ZXNMSR/IT4 Engine Diagnostic Fault Codes (Non-DPF Models)	286

INDEX	289
--------------	------------