CASE

PROFESSIONAL PARTNER

SERVICE MANUAL

4HK1-6HK1

ISUZU ENGINES

Lep 9-44060

Issued 02-2006

MidWestTech | Case Isuzu 4HK1-6HK1 Engine Service Manual | Publication 9-44060

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

GENERAL INFORMATION

General Information

Contents

General Information 0A-2
Service Precautions 0A-2
Reading the model 0A-6
General information 0A-7

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

ENGINE

ENGINE MECHANICAL (4HK1, 6HK1)

TABLE OF CONTENTS

ISUZU DIESEL ENGINE (4HK1, 6HK1) 1A-3
Precautions on Service Work 1A-3
Main Data and Specifications 1A-11
Cylinder Head Cover 1A-14
Components 1A-14
Removal 1A-15
Installation 1A-16
Torque Specifications 1A-18
Inlet Cover 1A-20
Components 1A-20
Removal 1A-21
Installation 1A-22
Torque Specifications 1A-24
Turbocharger and Exhaust Manifold 1A-25
Components 1A-25
Removal 1A-26
Inspection 1A-27
Installation 1A-28
Torque Specifications 1A-32
Timing Gear Train 1A-35
Components 1A-35
Removal 1A-36
Inspection 1A-38
Installation 1A-40
Torque Specifications 1A-51
Special Tool 1A-52
Rocker Arm Shaft ASM 1A-53
Components 1A-53
Removal 1A-53
Disassembly 1A-54
Reassembly 1A-56
Installation 1A-57
Torque Specifications 1A-59
Camshaft ASM 1A-60
Components 1A-60
Removal 1A-61
Disassembly 1A-62
Reassembly 1A-64
Fixing torque 1A-66
Special Tool 1A-66
Installation 1A-67
Torque Specifications 1A-69
Valve Stem Seal, Valve Spring 1A-70
Components 1A-70
Removal 1A-70
Inspection 1A-71
Installation 1A-72
Special Tool 1A-74
Cylinder Head 1A-75
Components 1A-75
Removal 1A-75
Disassembly 1A-79
Inspection 1A-82
Reassembly 1A-88
Installation 1A-94
Torque Specifications 1A-101
Special Tool 1A-101
Piston, Connecting Rod 1A-103
Components 1A-103
Removal 1A-103
Disassembly 1A-104
Reassembly 1A-110
Installation 1A-112
Torque Specifications 1A-114
Special Tool 1A-114
Flywheel 1A-115
Components 1A-115
Removal 1A-115
Inspection 1A-117
Installation 1A-117
Torque Specifications 1A-119
Special Tool 1A-119
Front Cover 1A-120
Components 1A-120
Removal 1A-121
Installation 1A-122
Torque Specifications 1A-124
Crankshaft Front Oil Seal 1A-126
Components 1A-126
Removal 1A-126
Installation 1A-128
Torque Specifications 1A-133
Special Tool 1A-133
Crankshaft Rear Oil Seal 1A-134
Components 1A-134
Removal 1A-134
Installation 1A-135
Special Tool 1A-138
Crankshaft 1A-139
Components 1A-139
Removal 1A-139
Disassembly 1A-141
Reassembly 1A-141
Inspection 1A-141
Installation 1A-146
Torque Specifications 1A-150
Special Tool 1A-150
Cylinder Block 1A-152
Components 1A-152
Removal 1A-152
Inspection 1A-153
Installation 1A-154
Lubrication System 1A-157
Precautions on Service Work 1A-157

MidWestTech | Case Isuzu 4HK1-6HK1 Engine Service Manual | Publication 9-44060 Order the manual at mid-west-tech.com >

ENGINE

Cooling System

TABLE OF CONTENTS

Cooling System 1B-2
Precautions on Service Work 1B-2
Function Check 1B-5
A List of Defective Phenomena 1B-7
Main Data and Specifications 1B-7
Water Pump (4HK1) 1B-8
Components 1B-8
Removal 1B-8
Inspection 1B-9
Installation 1B-10
Torque Specifications 1B-11
Water Pump (6HK1) 1B-12
Removal 1B-12
Installation 1B-14
Torque Specifications 1B-16
Disassembly 1B-17
Inspection and Repair 1B-18
Reassembly 1B-19
Thermostat 1B-22
Components 1B-22
Removal 1B-22
Inspection 1B-22
Installation 1B-23
Drive Belt 1B-24
Components 1B-24
Inspection 1B-24
Torque Specifications 1B-26

MidWestTech | Case Isuzu 4HK1-6HK1 Engine Service Manual | Publication 9-44060 Order the manual at mid-west-tech.com >

  - The connection at the data link connector (DLC) is secure.
  - Voltage supply circuit
- DO NOT disturb the tool harness while programming. If an interruption occurs during the programming procedure, programming failure or ECM damage may occur.
- Surrounding environment
  - Surrounding temperature must be between 0 and 50°C (32 and 122°F) during the programming procedure. Excessively low or high temperature may cause the programming failure or ECM damage.
  - Electromagnetic interference (EMI) on the tool harness and ECM may cause the programming failure or ECM damage.

Fuel Injector Flow Rate Programming Procedure

1. Connect the scan tool to the data link connector.
2. Connect the RS-232 to the scan tool and PC.
3. Start TIS 2000 and select the Service Programming System (SPS).
4. In the "Select Diagnostic Tool and Programming Process" screen, select the following menu.
   - Diagnostic tool "Pass-Thru".
   - Select Programming Process "Reprogram ECU".
   - ECU Location on the "Machine".

   Then, follow the SPS screen instructions.
5. Ensure that ALL programming contents are entered correctly and were programmed successfully by turning OFF the ignition for 30 seconds.
6. Using the scan tool to check each programmed fuel injector flow rate.
7. Start the engine and let idle.
8. Inspect for a proper engine running condition and for no DTCs. Refer to the "Diagnostic System Check – Engine Control" if needed.

MidWestTech | Case Isuzu 4HK1-6HK1 Engine Service Manual | Publication 9-44060 Order the manual at mid-west-tech.com >

Main Data and Specifications

Model (Manufacturer)			Nikko Electric Industry Co., Ltd
Rating	Voltage	V	24
	Power output	kw	5
	Time	Sec.	30
Number of pinion teeth			11
Revolution direction (viewed from pinion side)			Clockwise
Weight (approx.)		N {kg}	78.4 {8}
No load characteristic	Current/Voltage	A/V	85 or less/24
	Speed	rpm	3300 or more
Load characteristic	Current/Voltage	A/V	500 or less/18.5
	Torque	N·m {kgf·m}	28.4 {2.9} or more
	Speed	rpm	1250 or more
Locking characteristic	Current/Voltage	A/V	1400 or less/9
	Torque	N·m {kgf·m}	88.2 {9.0} or more

MidWestTech | Case Isuzu 4HK1-6HK1 Engine Service Manual | Publication 9-44060 Order the manual at mid-west-tech.com >

Trouble Diagnosis

Symptom	Trouble cause
No generation of electric power	a. Defective IC regulator b. Open circuit in field coil
Low output	a. Defective diode b. Defective stator coil c. Defective rectifier d. Internal short circuit in field coil
Too high regulated voltage	a. Defective IC regulator
Noise	a. Defective bearing b. Defective rectifier c. Foreign material in generator

Specifications

Item			Standard value and limit	
Isuzu Part No.			1-81200-633-0	1-81200-603-2
Manufacturer code No.			A009TU3782	A004TU6285
Rated output		(V-A)	24-90	24-50
Output characteristic (hot)	Voltage	(V)	27	27
	Current	(A)	105 or more	42 or more
	Revolution speed	(r/min)	2,500	2,500
	Voltage	(V)	27	27
	Current	(A)	114 or more	50 or more
	Revolution speed	(r/min)	5,000	5,000
Field coil resistance		(Ω: at 20°C)	4.3-5.0	4.4-5.1
Regulated voltage by regulator		(V)	28-29	28-29
Revolution direction (viewed from pulley side)			Clockwise	Clockwise

MidWestTech | Case Isuzu 4HK1-6HK1 Engine Service Manual | Publication 9-44060 Order the manual at mid-west-tech.com >