

Technical Manual

Operational Principle

ZAXIS

330-3 class

330-3·330LC-3

350H-3·350LCH-3

350LCK-3

350LC-3·350LCN-3

Hydraulic Excavator

Service Manual consists of the following separate Part No;
Technical Manual (Operational Principle) : Vol. No.TO1V7-E
Technical Manual (Troubleshooting) : Vol. No.TT1V7-E
Workshop Manual : Vol. No.W1V7-E

INTRODUCTION

TO THE READER

- This manual is written for an experienced technician to provide technical information needed to maintain and repair this machine.
- Be sure to thoroughly read this manual for correct product information and service procedures.
- If you have any questions or comments, at if you found any errors regarding the contents of this manual, please contact using "Service Manual Revision Request Form" at the end of this manual. (Note: Do not tear off the form. Copy it for usage.):

Publications Marketing & Product Support
Hitachi Construction Machinery Co. Ltd.
TEL: 81-298-32-7173
FAX: 81-298-31-1162

ADDITIONAL REFERENCES

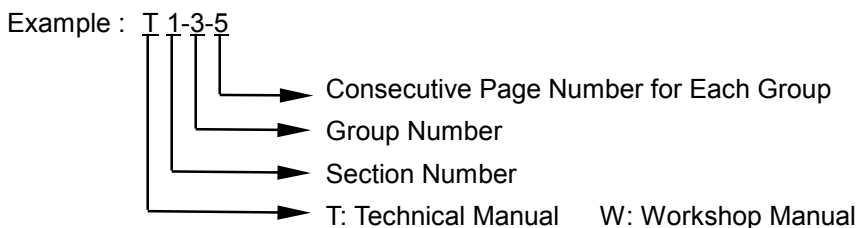
- Please refer to the materials listed below in addition to this manual.
 - The Operator's Manual
 - The Parts Catalog
 - Operation Manual of the Engine
 - Parts Catalog of the Engine
 - Hitachi Training Material

MANUAL COMPOSITION

- This manual consists of three portions: the Technical Manual (Operational Principle), the Technical Manual (Troubleshooting) and the Workshop Manual.
- Information included in the Technical Manual (Operational Principle):
technical information needed for redelivery and delivery, operation and activation of all devices and systems.
- Information included in the Technical Manual (Troubleshooting):
technical information needed for operational performance tests, and troubleshooting procedures.
- Information included in the Workshop Manual:
technical information needed for maintenance and repair of the machine, tools and devices needed for maintenance and repair, maintenance standards, and removal/installation and assemble/disassemble procedures.

PAGE NUMBER


- Each page has a number, located on the center lower part of the page, and each number contains the following information:



INTRODUCTION


SAFETY ALERT SYMBOL AND HEADLINE NOTATIONS

In this manual, the following safety alert symbol and signal words are used to alert the reader to the potential for personal injury or machine damage.


 This is the safety alert symbol. When you see this symbol, be alert to the potential for personal injury. Never fail to follow the safety instructions prescribed along with the safety alert symbol.

The safety alert symbol is also used to draw attention to component/part weights.

To avoid injury and damage, be sure to use appropriate lifting techniques and equipment when lifting heavy parts.

-  **CAUTION:**
Indicated potentially hazardous situation which could, if not avoided, result in personal injury or death.

- **IMPORTANT:**
Indicates a situation which, if not conformed to the instructions, could result in damage to the machine.

-  **NOTE:**
Indicates supplementary technical information or know-how.

UNITS USED

- SI Units (International System of Units) are used in this manual. MKSA system units and English units are also indicated in parentheses just behind SI units.

Example : 24.5 MPa (250 kgf/cm², 3560 psi)

A table for conversion from SI units to other system units is shown below for reference purposes.

Quantity	To Convert From	Into	Multiply By	Quantity	To Convert From	Into	Multiply By
Length	mm	in	0.03937	Pressure	MPa	kgf/cm ²	10.197
	mm	ft	0.003281		MPa	psi	145.0
Volume	L	US gal	0.2642	Power	kW	PS	1.360
	L	US qt	1.057		kW	HP	1.341
	m ³	yd ³	1.308	Temperature	°C	°F	°C×1.8+32
Weight	kg	lb	2.205	Velocity	km/h	mph	0.6214
Force	N	kgf	0.10197		min ⁻¹	rpm	1.0
	N	lbf	0.2248	Flow rate	L/min	US gpm	0.2642
Torque	N·m	kgf·m	1.0197		mL/rev	cc/rev	1.0
	N·m	lbf·ft	0.7375				

SECTION AND GROUP CONTENTS

TECHNICAL MANUAL

(Operational Principle)

SECTION 1 GENERAL

Group 1 Specification

Group 2 Component Layout

Group 3 Component Specifications

SECTION 2 SYSTEM

Group 1 Control System

Group 2 Control System

Group 3 ECM System

Group 4 Hydraulic System

Group 5 Electrical System

SECTION 3 COMPONENT OPERATION

Group 1 Pump Device

Group 2 Swing Device

Group 3 Control Valve

Group 4 Pilot Valve

Group 5 Travel Device

Group 6 Signal Control Valve

Group 7 Others (Upperstructure)

Group 8 Others (Undercarriage)

TECHNICAL MANUAL (Troubleshooting)

SECTION 4 OPERATIONAL PERFORMANCE TEST

Group 1 Introduction
Group 2 Standard
Group 3 Engine Test
Group 4 Excavator Test
Group 5 Component Test

SECTION 5 TROUBLESHOOTING

Group 1 Diagnosing Procedure
Group 2 Monitor Unit
Group 3 Dr. ZX
Group 4 e-Shovel
Group 5 Component Layout
Group 6 Troubleshooting A
Group 7 Troubleshooting B
Group 8 Electrical System Inspection

All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

WORKSHOP MANUAL

SECTION 1 GENERAL INFORMATION

Group 1 Precautions for Disassembling and Assembling

Group 2 Tightening Torque

Group 3 Painting

Group 4 Bleeding Air from Hydraulic Oil Tank

SECTION 2 UPPERSTRUCTURE

Group 1 Cab

Group 2 Counterweight

Group 3 Main Frame

Group 4 Pump Device

Group 5 Control Valve

Group 6 Swing Device

Group 7 Pilot Valve

Group 8 Pilot Shut-Off Valve

Group 9 Signal Control Valve

Group 10 Solenoid Valve

SECTION 3 UNDERCARRIAGE

Group 1 Swing Bearing

Group 2 Travel Device

Group 3 Center Joint

Group 4 Track Adjuster

Group 5 Front Idler

Group 6 Upper and Lower Roller

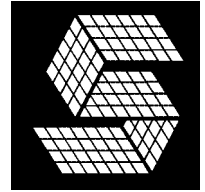
Group 7 Track

SECTION 4 FRONT ATTACHMENT

Group 1 Front Attachment

Group 2 Cylinder

SECTION 1 GENERAL



—CONTENTS—

Group 1 Specifications

Specifications	T1-1-1
Working Ranges.....	T1-1-2

Group 2 Component Layout

Main Components	T1-2-1
Electrical System (Overview).....	T1-2-3
Engine.....	T1-2-8
Pump Device.....	T1-2-9
Swing Device	T1-2-9
Control Valve.....	T1-2-10
Signal Control Valve	T1-2-10
Solenoid Valve Unit	T1-2-11
Travel Device	T1-2-11

Group 3 Component Specifications

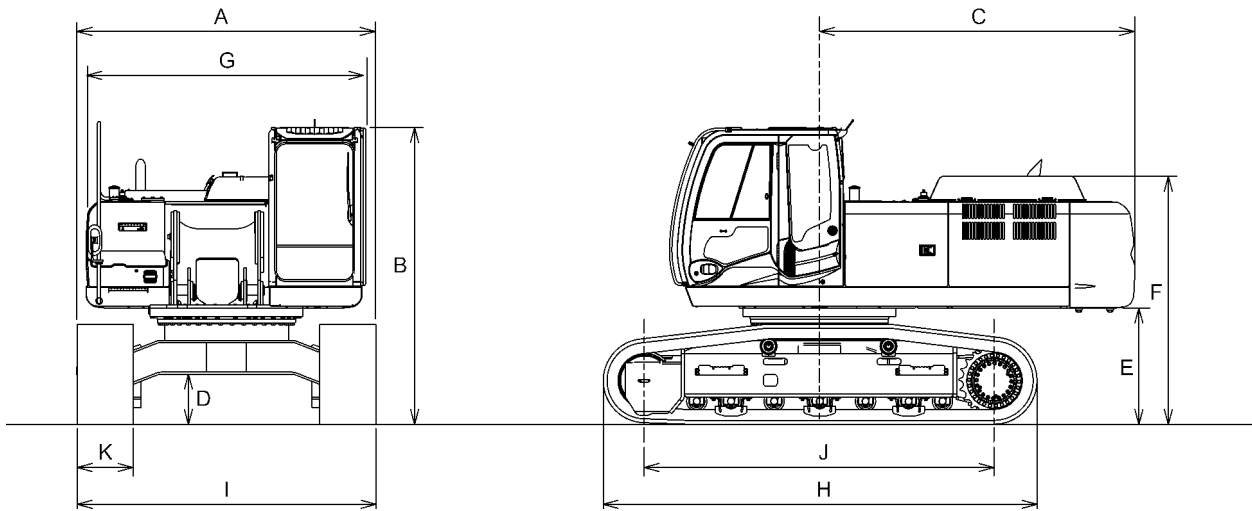
Engine.....	T1-3-1
Engine Accessories	T1-3-4
Hydraulic Component	T1-3-5
Electrical Component	T1-3-10

(Blank)

GENERAL / Specifications

SPECIFICATIONS

ZAXIS330-3



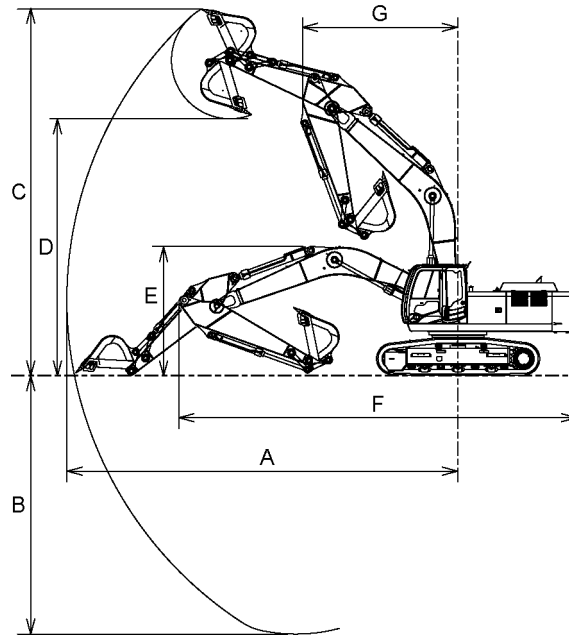
T1V7-01-01-001

Model	ZAXIS330-3
Type of Front-End Attachment	3.2 m (10 ft 6 in) Arm
Bucket Capacity (Heaped)	PCSA 1.40 m ³ (1.20 yd ³), CECE 1.2 m ³ (1.57 yd ³)
Operating Weight	31600 kg (69700 lb)
Basic Machine Weight	24100 kg (53100 lb)
Engine	Isuzu AH-6HK1XYSA-01 202 kW/1900 min ⁻¹ (275 PS/1900 rpm) (HP Mode)
A: Overall Width (Excluding back mirrors)	3190 mm (10 ft 6 in)
B: Cab Height	3160 mm (10 ft 4 in)
C: Rear End Swing Radius	3370 mm (11 ft 1 in)
D: Minimum Ground Clearance	* 500 mm (19.7 in)
E: Counterweight Clearance	* 1160 mm (3 ft 10 in)
F: Engine Cover Height	* 2590 mm (8 ft 6 in)
G: Overall Width of Upperstructure	2990 mm (9 ft 10 in)
H: Undercarriage Length	4640 mm (15 ft 3 in)
I: Undercarriage Width	3190 mm (10 ft 6 in)
J: Sprocket Center to Idler Center	3730 mm (12 ft 3 in)
K: Track Shoe Width	600 mm (24 in) (Grouser shoe)
Ground Pressure	64 kPa (0.65 kgf/cm ² , 9.3 psi)
Swing Speed	10.7 min ⁻¹ (rpm)
Travel Speed (fast/slow)	5.5/3.2 km/h (3.4/2.0 mph)
Gradeability	35° (tan θ = 0.70)

NOTE: "*" The dimensions do not include height of the shoe lug.

GENERAL / Specifications

WORKING RANGES ZAXIS330-3 (Mono Boom)



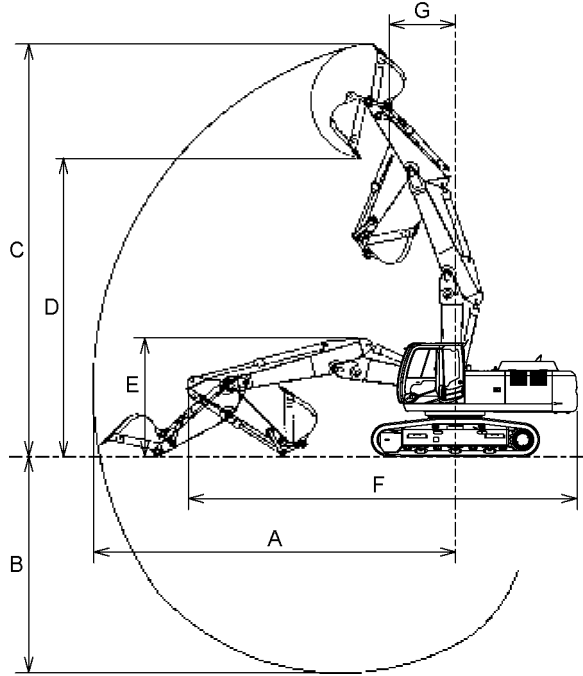
T1V7-01-01-002

Model		ZAXIS330-3							
Item	Category	2.33 m (7 ft 8 in) Arm		2.67 m (8 ft 9 in) Arm		3.2 m (10 ft 6 in) Arm		4.0 m (13 ft 1 in) Arm	
		mm	ft·in	mm	ft·in	mm	ft·in	mm	ft·in
A:	Maximum Digging Reach	10310	33'10"	10570	34'8"	11100	36'5"	11860	38'11"
B:	Maximum Digging Depth	6500	32'4"	6840	22'5"	7380	24'3"	8180	26'10"
C:	Maximum Cutting Height	9980	32'9"	9990	32'9"	10360	33'12"	10750	35'3"
D:	Maximum Dumping Height	6900	22'8"	6940	22'9"	7240	23'9"	7630	25'0"
E:	Transport Height	3510	11'6"	3470	11'5"	3270	10'9"	3600	11'10"
F:	Overall Transport Length	11170	36'8"	11130	36'6"	11000	36'1"	11090	36'5"
G:	Minimum Swing Radius	4460	22'8"	4610	15'2"	4460	14'8"	4470	14'8"

NOTE: The dimensions do not include height of the shoe lug (except Item E).

GENERAL / Specifications

ZAXIS330-3 (2-Piece Boom)



T1V7-01-01-003

Model		ZAXIS330-3							
Category		2.33 m (7 ft 8 in) Arm		2.67 m (8 ft 9 in) Arm		3.2 m (10 ft 6 in) Arm		4.0 m (13 ft 1 in) Arm	
Item		mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in
A:	Maximum Digging Reach	10390	34'1"	10680	35'1"	11220	36'10"	12000	39'4"
B:	Maximum Digging Depth	10170	33'4"	6360	20'10"	6900	22'8"	7700	25'3"
C:	Maximum Cutting Height	11870	38'11"	12060	39'7"	12550	41'2"	13210	43'4"
D:	Maximum Dumping Height	8550	28'	8750	28'9"	9240	30'4"	9910	32'6"
E:	Transport Height	3380	11'1"	3370	11'1"	3310	10'10"	3690	12'1"
F:	Overall Transport Length	11150	36'7"	11110	36'5"	11070	36'4"	11020	36'2"
G:	Minimum Swing Radius	3250	10'8"	3120	10'3"	2890	9'6"	3230	10'7"

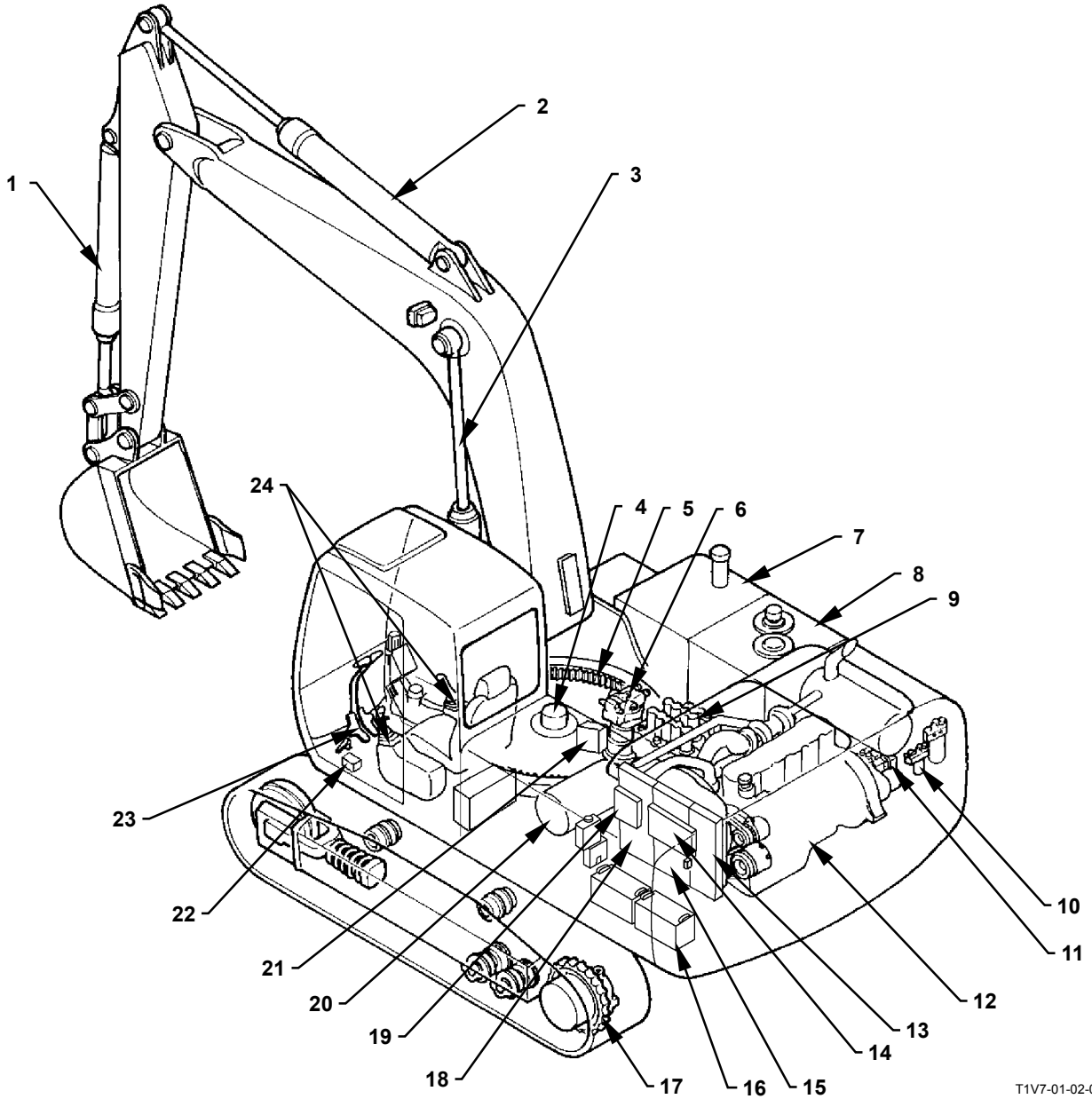
NOTE: The dimensions do not include height of the shoe lug (except Item E).

GENERAL / Specifications

(Blank)

GENERAL / Component Layout

MAIN COMPONENTS

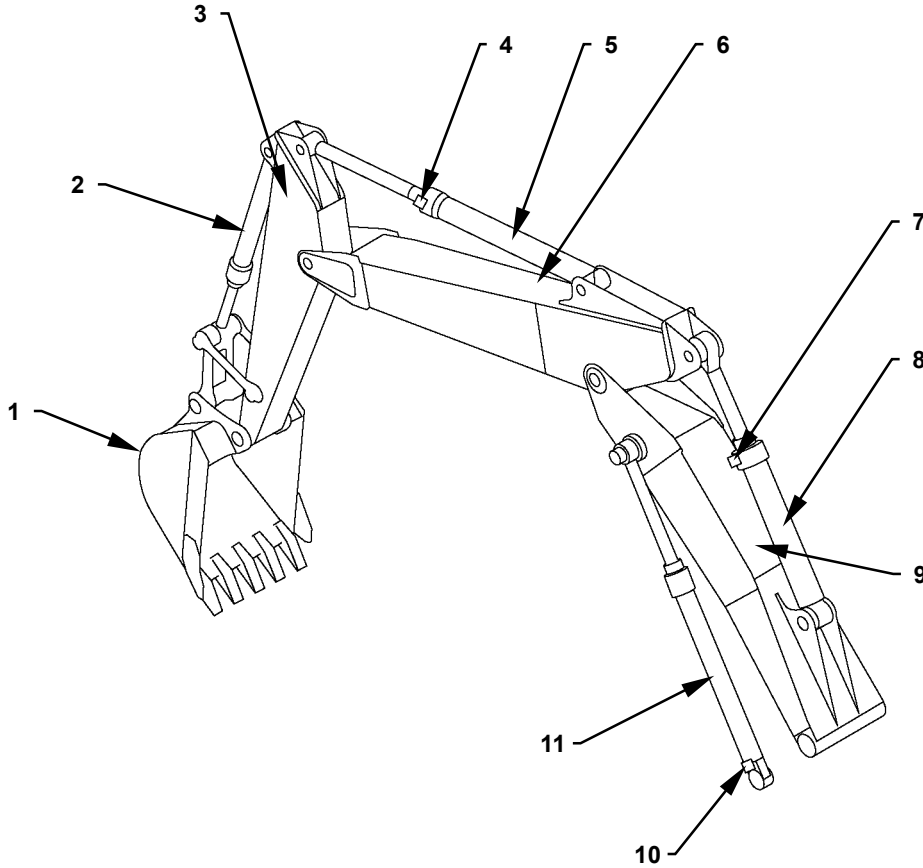


T1V7-01-02-006

- | | | | |
|---------------------|---------------------------------------|--------------------------------|---|
| 1 - Bucket Cylinder | 7 - Fuel Tank | 13 - Intercooler | 19 - Fuel Cooler |
| 2 - Arm Cylinder | 8 - Hydraulic Oil Tank | 14 - Air Conditioner Condenser | 20 - Air Cleaner |
| 3 - Boom Cylinder | 9 - Control Valve | 15 - Radiator | 21 - Signal Control Valve |
| 4 - Center Joint | 10 - Pilot Filter/ Pilot Relief Valve | 16 - Battery | 22 - Pilot Shut-Off Solenoid Valve |
| 5 - Swing Bearing | 11 - Pump Device | 17 - Travel Device | 23 - Travel Pilot Valve |
| 6 - Swing Device | 12 - Engine | 18 - Oil Cooler | 24 - Front Attachment / Swing Pilot Valve |

GENERAL / Component Layout

Front Attachment (2-Piece Boom)

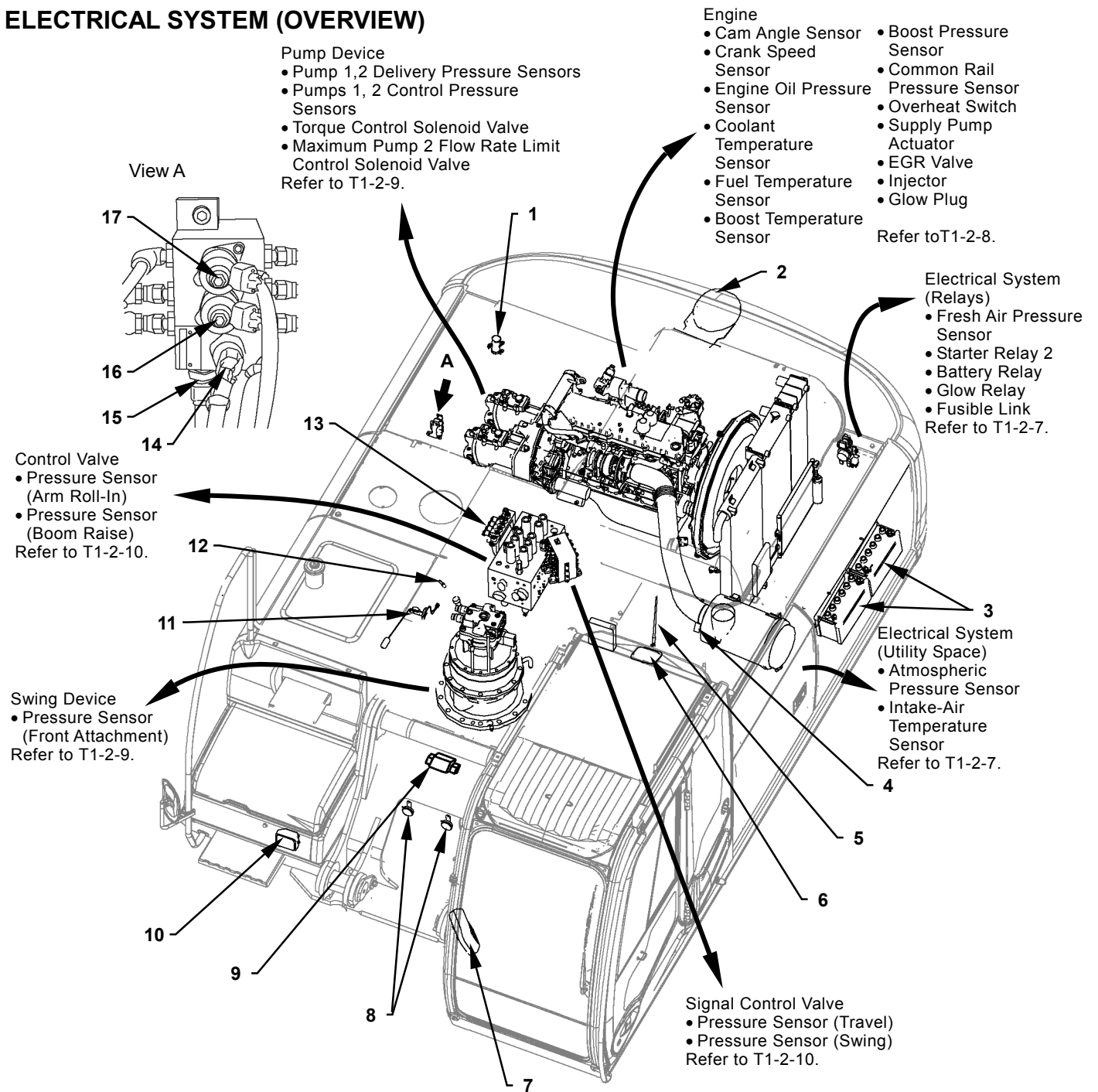


T1V1-01-02-006

- | | | | |
|---------------------|---------------------------------------|---|---|
| 1 - Bucket | 4 - Hose Rupture Valve (Arm Cylinder) | 7 - Hose Rupture Valve (Positioning Cylinder) | 10 - Hose Rupture Valve (Boom Cylinder) |
| 2 - Bucket Cylinder | 5 - Arm Cylinder | 8 - Positioning Cylinder | 11 - Boom Cylinder |
| 3 - Arm | 6 - Upper Boom | 9 - Bottom Boom | |

GENERAL / Component Layout

ELECTRICAL SYSTEM (OVERVIEW)

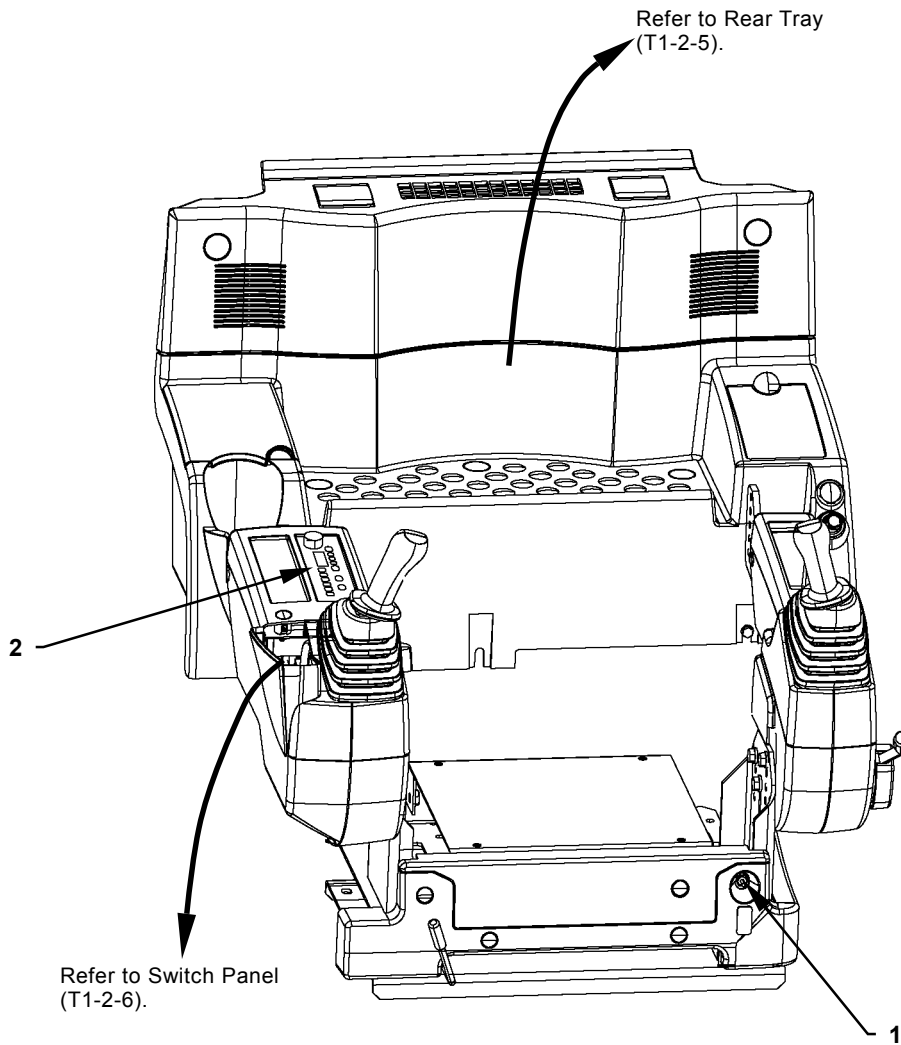


T1V7-01-02-010

- | | | | |
|-----------------------------------|---|---------------------------------------|--|
| 1 - Solenoid Pump | 6 - GPS (Global Positioning System) | 10 - Working Light | 14 - Pump 2 Control Pressure Sensor |
| 2 - Rear View Camera | 7 - Monitor Unit | 11 - Fuel Sensor | 15 - Pump 1 Control Pressure Sensor |
| 3 - Battery | 8 - Horn | 12 - Hydraulic Oil Temperature Sensor | 16 - Maximum Pump 2 Flow Rate Limit Control Solenoid Valve |
| 4 - Air Filter Restriction Switch | 9 - Positioning Control Valve (2-Piece Boom Machine Only) | 13 - Solenoid Valve Unit | 17 - Torque Control Solenoid Valve |
| 5 - Sending / Receiving Aerial | | | |

GENERAL / Component Layout

Electrical System (In Cab)



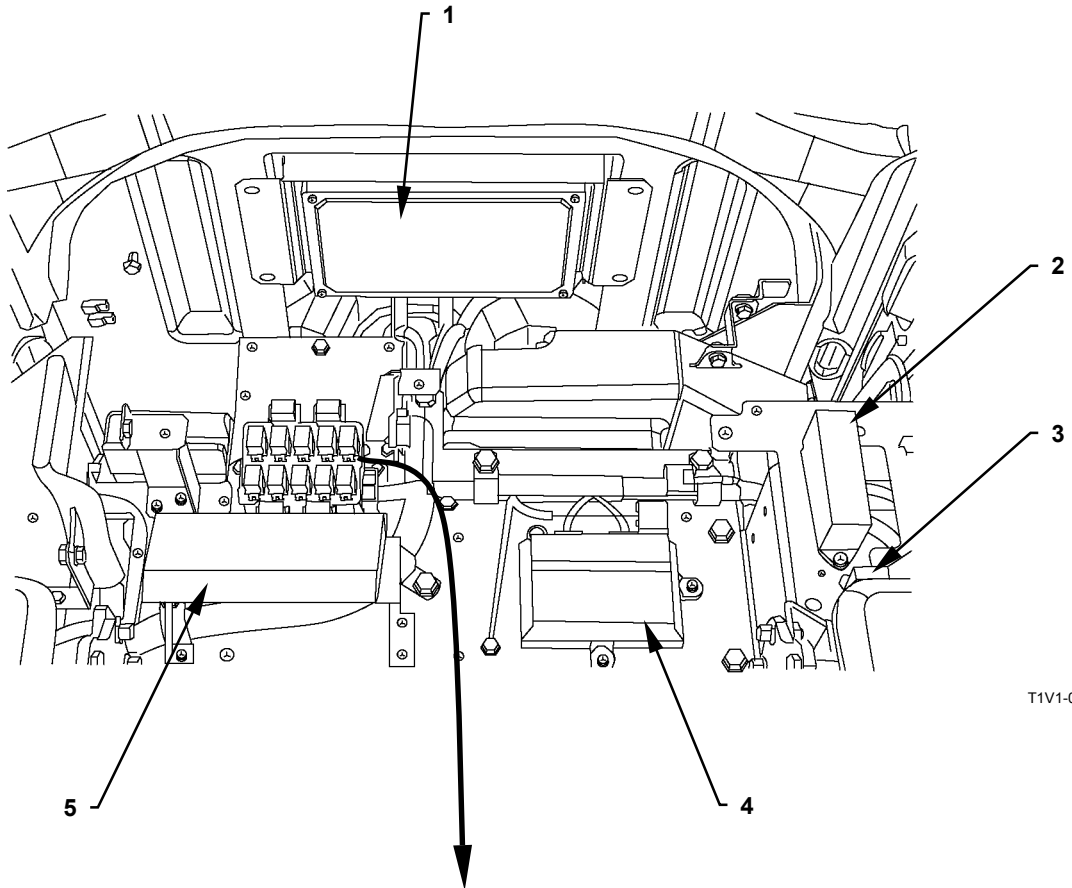
T1V1-01-02-011

1 - Engine Stop Switch

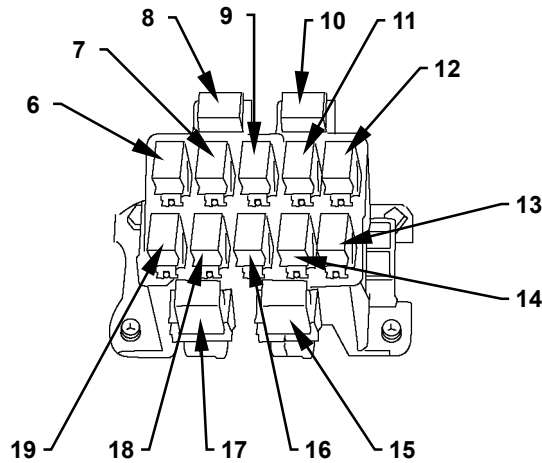
2 - Radio

GENERAL / Component Layout

Electrical System (Rear Tray)



T1V1-01-02-007

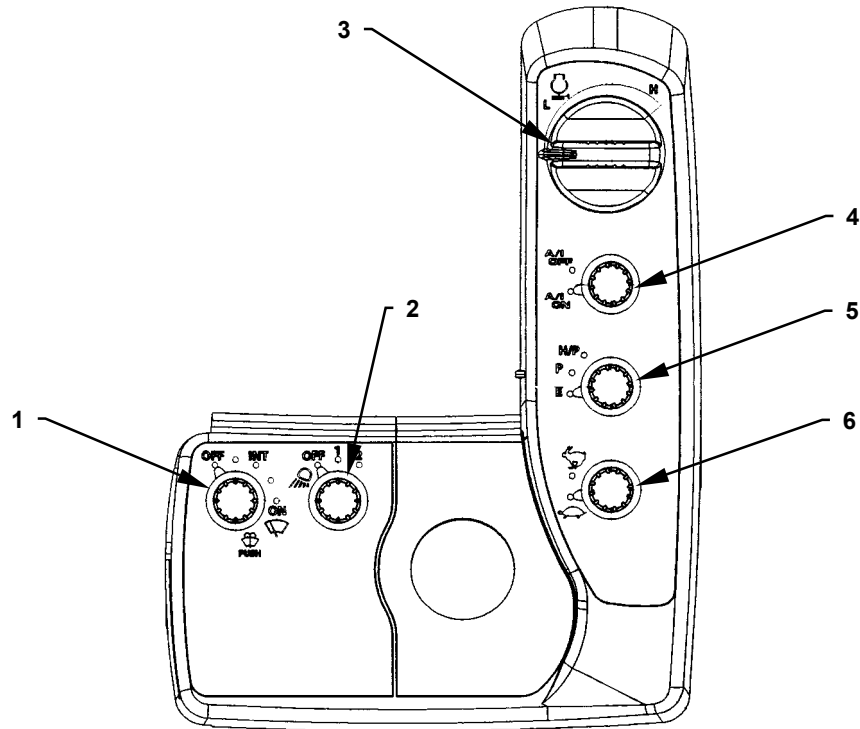


T1V1-01-02-009

- | | | | |
|--|---------------------------------------|---|---|
| 1 - MC (Main Controller) | 6 - Starter Relay 2 (R5) | 11 - Pilot Shut-Off Relay (R12) | 16 - Light Relay 2 (R8) |
| 2 - Fuse Box | 7 - Starter Cut Relay (R4) | 12 - Load Damp Relay (R1) | 17 - ECM (Engine Control Module) Main Relay (R14) |
| 3 - Dr. ZX Connector (Download Connector Using Combinedly) | 8 - OFF Relay (Air Conditioner) (R12) | 13 - Wiper Relay (R6) | 18 - Washer Relay (R9) |
| 4 - ICF (Information Controller) | 9 - Security Horn Relay (R3) | 14 - Light Relay 1 (R7) | 19 - Horn Relay (R10) |
| 5 - Satellite Communication Terminal (Optional) | 10 - Air Conditioner Relay (R11) | 15 - MAX HI Relay (Air Conditioner) (R13) | |

GENERAL / Component Layout

Electrical System (Switch Panel)



T1V1-04-02-001

1 - Wiper / Washer Switch
2 - Working Light Switch

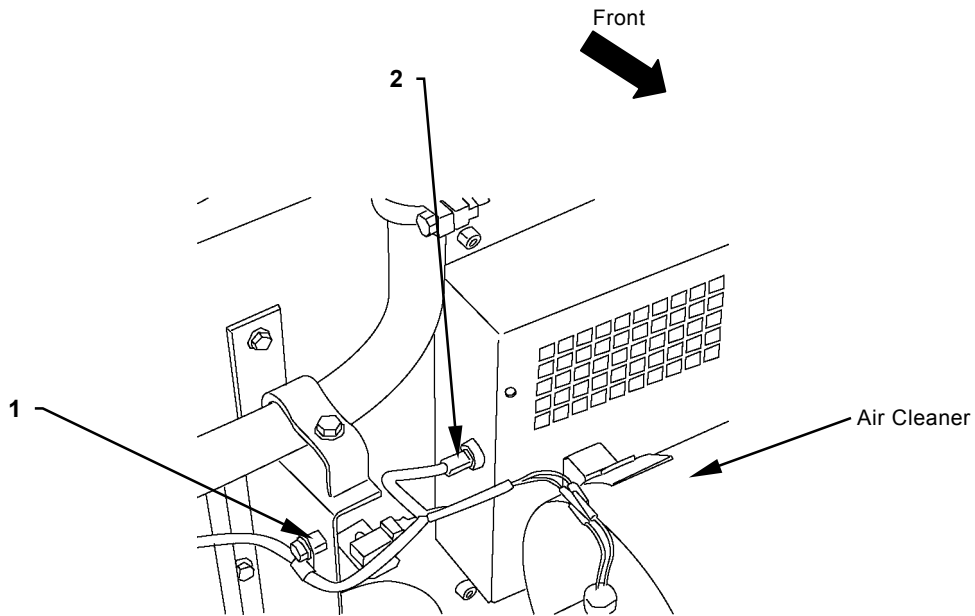
3 - Engine Control Dial
4 - Auto-Idle Switch

5 - Power Mode Switch

6 - Travel Mode Switch

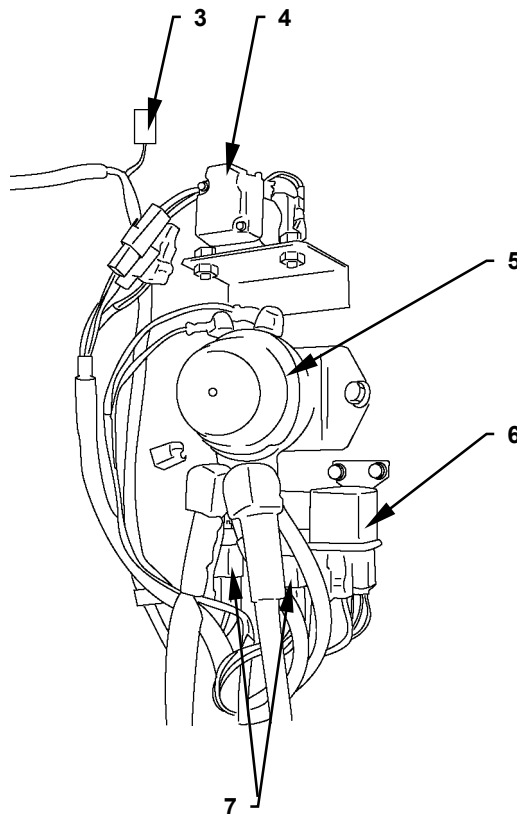
GENERAL / Component Layout

Electrical System (Utility Space)



T1V7-01-02-005

Electrical System (Relays)

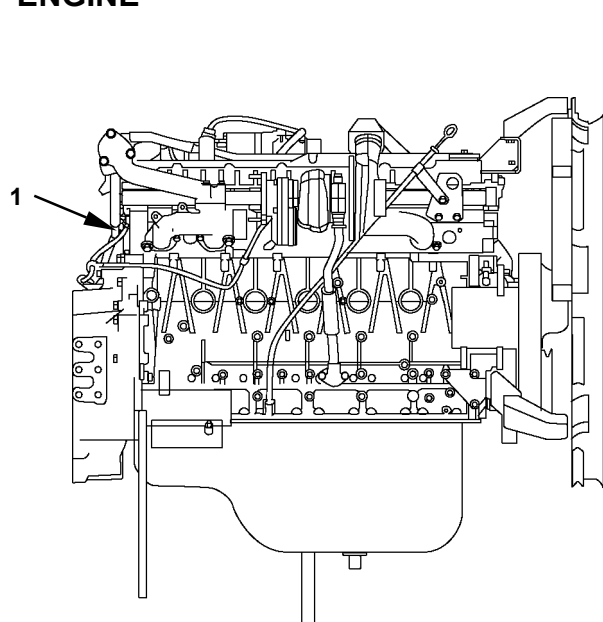


T1V1-01-02-018

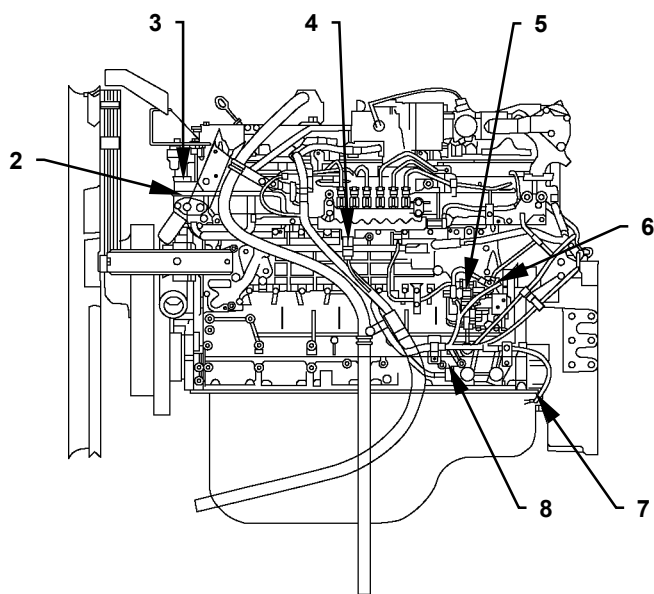
- | | | | |
|-----------------------------------|-------------------------------|-------------------|------------------|
| 1 - Atmospheric Pressure Sensor | 3 - Fresh Air Pressure Sensor | 5 - Battery Relay | 7 - Fusible Link |
| 2 - Intake-Air Temperature Sensor | 4 - Starter Relay 2 | 6 - Glow Relay | |

GENERAL / Component Layout

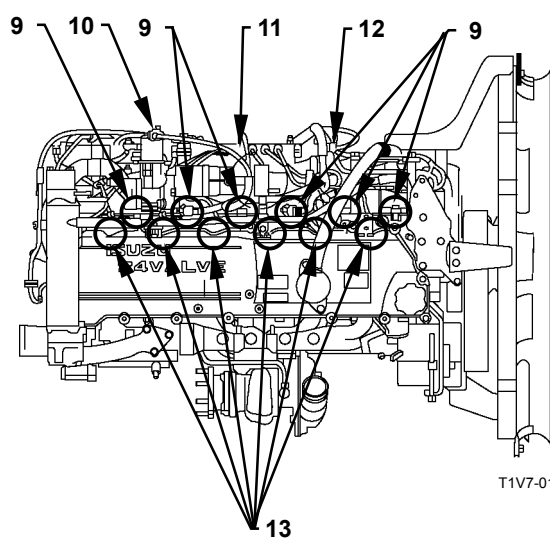
ENGINE



T1V7-01-02-002



T1V7-01-02-003



T1V7-01-02-001

- | | | | |
|---------------------------------|-----------------------------|--|-------------------------------|
| 1 - Cam Angle Sensor | 5 - Supply Pump Actuator | 8 - Hydraulic Oil Pressure Sensor | 11 - Boost Temperature Sensor |
| 2 - Coolant Temperature Sensor | 6 - Fuel Temperature Sensor | 9 - Injector | 12 - Boost Pressure Sensor |
| 3 - Overheat Switch | 7 - Crank Speed Sensor | 10 - EGR (Exhaust Gas Recirculation) Valve | 13 - Glow Plug |
| 4 - Common Rail Pressure Sensor | | | |