DTC-Code	SPN	FMI	Fault description
P0205	5362	5	Engine - Fuel injection quantity injector 5 - Currentbelow normal or open circuit
P0206	5363	6	Engine - Fuel injection quantity injector 6 - Currentabove normal or grounded circuit
P0206	5363	6	Engine - Fuel injection quantity injector 6 - Currentabove normal or grounded circuit
P0206	5363	5	Engine - Fuel injection quantity injector 6 - Currentbelow normal or open circuit
P0207	5364	6	Engine - Fuel injection quantity injector 7- Current above normal or grounded circuit
P0207	5364	6	Engine - Fuel injection quantity injector 7- Current above normal or grounded circuit
P0207	5364	5	Engine - Fuel injection quantity injector 7- Current below normal or open circuit
P0208	5365	6	Engine - Fuel injection quantity injector 8- Current above normal or grounded circuit
P0208	5365	6	Engine - Fuel injection quantity injector 8- Current above normal or grounded circuit
P0208	5365	5	Engine - Fuel injection quantity injector 8- Current below normal or open circuit
P0217	110	0	Engine - Coolant temperature sensor - Data abovenormal operational range (Most severe level)
P0217	110	0	Engine - Coolant temperature sensor - Data abovenormal operational range (Most severe level)
P0219	190	0	Engine - Rotation speed - Data above normaloperational range (Most severe level)
P0251	7103	6	Engine - Rail pressure pump - Current above normal orgrounded circuit
P0251	7103	4	Engine - Rail pressure pump - Voltage below normal orshorted to low source
P0251	7103	3	Engine - Rail pressure pump - Voltage above normal orshorted to high source
P0251	7103	5	Engine - Rail pressure pump - Current below normal oropen circuit
P02E7	132	2	Engine - Air mass - Data erratic intermittent or incorrect
P0336	4201	8	Engine - Crankshaft rotation speed sensor - Abnormalfrequency or pulse width or period
P0336	4201	14	Engine - Crankshaft rotation speed sensor - Specialinstructions
P033F	723	13	Engine - Camshaft rotation speed sensor - Out ofcalibration
P0341	723	8	Engine - Camshaft rotation speed sensor - Abnormalfrequency or pulse width or period
P0341	723	14	Engine - Camshaft rotation speed sensor - Specialinstructions
P0405	411	4	Engine - EGR differential pressure - Voltage belownormal or shorted to low source
P0406	411	3	Engine - EGR differential pressure - Voltage abovenormal or shorted to high source
P040A	412	4	Engine - EGR temperature sensor - Voltage belownormal or shorted to low source

DTC-Code	SPN	FMI	Fault description
P040A	412	3	Engine - EGR temperature sensor - Voltage abovenormal or shorted to high source
P040A	412	17	Engine - EGR temperature sensor - Data below normaloperational range (Least severe level)
P040A	412	15	Engine - EGR temperature sensor - Data above normaloperational range (Least severe level)
P040A	412	2	Engine - EGR temperature sensor - Data erraticintermittent or incorrect
P0425	4765	4	Exhaust aftertreatment - Temperature bevor DOC -Voltage below normal or shorted to low source
P0425	4765	3	Exhaust aftertreatment - Temperature bevor DOC -Voltage above normal or shorted to high source
P0425	4765	2	Exhaust aftertreatment - Temperature bevor DOC -Data erratic intermittent or incorrect
P0425	4765	2	Exhaust aftertreatment - Temperature bevor DOC -Data erratic intermittent or incorrect
P0425	4765	15	Exhaust aftertreatment - Temperature bevor DOC -Data above normal operational range (Least severelevel)
P042A	4766	4	Exhaust aftertreatment - Temperature after DOC -Voltage below normal or shorted to low source
P042A	4766	3	Exhaust aftertreatment - Temperature after DOC -Voltage above normal or shorted to high source
P042A	4766	2	Exhaust aftertreatment - Temperature after DOC - Dataerratic intermittent or incorrect
P042A	4766	15	Exhaust aftertreatment - Temperature after DOC - Dataabove normal operational range (Least severe level)
P042E	27	7	Engine - Position EGR valve - Mechanical system notresponding or out of adjustment
P042F	27	7	Engine - Position EGR valve - Mechanical system notresponding or out of adjustment
P046C	411	2	Engine - EGR differential pressure - Data erraticintermittent or incorrect
P046D	411	2	Engine - EGR differential pressure - Data erraticintermittent or incorrect
P0480	1071	5	Engine - Fan drive output - Current below normal oropen circuit
P0489	27	4	Engine - Position EGR valve - Voltage below normal orshorted to low source
P0490	27	3	Engine - Position EGR valve - Voltage above normal orshorted to high source
P0522	100	4	Engine - Oil pressure sensor - Voltage below normal orshorted to low source
P0523	100	3	Engine - Oil pressure sensor - Voltage above normal orshorted to high source
P0524	100	18	Engine - Oil pressure sensor - Data below normaloperational range (Moderately severe level)
P0524	100	1	Engine - Oil pressure sensor - Data below normaloperational range (Most severe level)

DTC-Code	SPN	FMI	Fault description
P0541	729	4	Engine - Preheating relay - Voltage below normal orshorted to low source
P0542	729	3	Engine - Preheating relay - Voltage above normal orshorted to high source
P0543	729	5	Engine - Preheating relay - Current below normal oropen circuit
P0616	677	4	Engine - Starter relay - Voltage below normal or shorted to low source
P0617	677	3	Engine - Starter relay - Voltage above normal or shorted to high source
P0627	1347	4	Engine - Fuel supply pump - Voltage below normal orshorted to low source
P0627	1347	3	Engine - Fuel supply pump - Voltage above normal orshorted to high source
P0627	1347	5	Engine - Fuel supply pump - Current below normal oropen circuit
P062A	1347	11	Engine - Fuel supply pump - Root cause not known
P062B	3055	14	Engine - Fuel system monitoring - Special instructions
P0638	51	6	Engine - Throttle valve position - Current above normalor grounded circuit
P0638	51	4	Engine - Throttle valve position - Voltage below normalor shorted to low source
P0638	51	3	Engine - Throttle valve position - Voltage above normalor shorted to high source
P0638	51	5	Engine - Throttle valve position - Current below normalor open circuit
P0667	1136	17	Engine - ECU temperature - Data below normaloperational range (Least severe level)
P0667	1136	15	Engine - ECU temperature - Data above normaloperational range (Least severe level)
P0667	1136	1	Engine - ECU temperature - Data below normaloperational range (Most severe level)
P0667	1136	0	Engine - ECU temperature - Data above normaloperational range (Most severe level)
P0667	1136	2	Engine - ECU temperature - Data erratic intermittent orincorrect
P0686	1485	4	Engine - ECU main relay - Voltage below normal orshorted to low source
P0687	1485	3	Engine - ECU main relay - Voltage above normal orshorted to high source
P0691	1071	4	Engine - Fan drive output - Voltage below normal orshorted to low source
P0692	1071	3	Engine - Fan drive output - Voltage above normal orshorted to high source
P06B0	3509	14	Engine - ECU sensor supply voltage - Specialinstructions
P06B1	3509	6	Engine - ECU sensor supply voltage - Current abovenormal or grounded circuit
P06B1	3509	1	Engine - ECU sensor supply voltage - Data belownormal operational range (Most severe level)
P06B2	3509	0	Engine - ECU sensor supply voltage - Data abovenormal operational range (Most severe level)
P06B3	3510	14	Engine - ECU sensor supply voltage 2 - Specialinstructions
P06B4	3510	6	Engine - ECU sensor supply voltage 2 - Current abovenormal or grounded circuit
P06B4	3510	1	Engine - ECU sensor supply voltage 2 - Data belownormal operational range (Most severe level)

DTC-Code	SPN	FMI	Fault description
P06B5	3510	0	Engine - ECU sensor supply voltage 2 - Data abovenormal operational range (Most severe level)
P06E6	3511	14	Engine - ECU sensor supply voltage 3 - Specialinstructions
P06E6	3511	11	Engine - ECU sensor supply voltage 3 - Root cause notknown
P06E7	3511	6	Engine - ECU sensor supply voltage 3 - Current abovenormal or grounded circuit
P06E7	3511	1	Engine - ECU sensor supply voltage 3 - Data belownormal operational range (Most severe level)
P06E8	3511	0	Engine - ECU sensor supply voltage 3 - Data abovenormal operational range (Most severe level)
P1001	2797	14	Engine - Injector group - Special instructions
P1002	164	2	Engine - Rail pressure - Data erratic intermittent orincorrect
P1003	2797	6	Engine - Injector group - Current above normal orgrounded circuit
P1004	2798	6	Engine - Injector group 2 - Current above normal orgrounded circuit
P1005	520280	11	Engine - Injection driver metering unit - Root cause notknown
P1006	7103	3	Engine - Rail pressure pump - Voltage above normal orshorted to high source
P1007	7103	4	Engine - Rail pressure pump - Voltage below normal orshorted to low source
P1008	5571	2	Engine - Pressure relief valve (PRV) - Data erraticintermittent or incorrect
P1009	5571	2	Engine - Pressure relief valve (PRV) - Data erraticintermittent or incorrect
P100A	5571	0	Engine - Pressure relief valve (PRV) - Data abovenormal operational range (Most severe level)
P100B	5571	2	Engine - Pressure relief valve (PRV) - Data erraticintermittent or incorrect
P100C	5571	2	Engine - Pressure relief valve (PRV) - Data erraticintermittent or incorrect
P100D	5571	13	Engine - Pressure relief valve (PRV) - Out of calibration
P100E	5571	16	Engine - Pressure relief valve (PRV) - Data abovenormal operational range (Moderately severe level)
P1010	652	13	Engine - Injector 2 - Out of calibration
P1011	653	13	Engine - Injector 3 - Out of calibration
P1012	654	13	Engine - Injector 4 - Out of calibration
P1013	655	13	Engine - Injector 5 - Out of calibration
P1014	656	13	Engine - Injector 6 - Out of calibration
P1015	7103	13	Engine - Rail pressure pump - Out of calibration
P1016	7103	13	Engine - Rail pressure pump - Out of calibration
P1017	7103	13	Engine - Rail pressure pump - Out of calibration
P1018	7103	2	Engine - Rail pressure pump - Data erratic intermittentor incorrect
P1019	5357	14	Engine - Fuel injection quantity multiple cylinder -Special instructions

DTC-Code	SPN	FMI	Fault description
P101A	157	0	Engine - Rail pressure metering unit - Data abovenormal operational range (Most severe level)
P101D	2797	4	Engine - Injector group - Voltage below normal orshorted to low source
P101E	520426	6	Engine - Injection valve bank Secondary 0 - Currentabove normal or grounded circuit
P101F	520427	6	Engine - Injection valve bank Secondary 1 - Currentabove normal or grounded circuit
P1020	3509	3	Engine - ECU sensor supply voltage - Voltage abovenormal or shorted to high source
P1021	3509	4	Engine - ECU sensor supply voltage - Voltage belownormal or shorted to low source
P1022	520279	7	Machine - HMI return button - Mechanical system notresponding or out of adjustment
P1023	91	3	Machine - Position accelerator pedal - Voltage abovenormal or shorted to high source
P1024	2623	3	Machine - Accelerator pedal channel 2 - Voltage abovenormal or shorted to high source
P1025	29	3	Machine - Position accelerator pedal 2 - Voltage abovenormal or shorted to high source
P1026	2625	3	Machine - Accelerator pedal 2 channel 2 - Voltageabove normal or shorted to high source
P1027	91	4	Machine - Position accelerator pedal - Voltage belownormal or shorted to low source
P1028	2623	4	Machine - Accelerator pedal channel 2 - Voltage belownormal or shorted to low source
P1029	29	4	Machine - Position accelerator pedal 2 - Voltage belownormal or shorted to low source
P102A	2625	4	Machine - Accelerator pedal 2 channel 2 - Voltage belownormal or shorted to low source
P102B	677	5	Engine - Starter relay - Current below normal or opencircuit
P102C	677	3	Engine - Starter relay - Voltage above normal or shorted to high source
P102D	677	4	Engine - Starter relay - Voltage below normal or shorted to low source
P102E	91	11	Machine - Position accelerator pedal - Root cause notknown
P102F	29	11	Machine - Position accelerator pedal 2 - Root cause notknown
P1030	1041	14	Engine - Starter signal KL. 50 - Special instructions
P1031	3510	3	Engine - ECU sensor supply voltage 2 - Voltage abovenormal or shorted to high source
P1032	3510	4	Engine - ECU sensor supply voltage 2 - Voltage belownormal or shorted to low source
P1036	520417	31	Engine - Dummy element - Condition exists
P103D	520424	31	Engine - Controller access failed - Condition exists
P103E	5099	11	Machine - Oil pressure lamp - Root cause not known

DTC-Code	SPN	FMI	Fault description
P103F	5099	3	Machine - Oil pressure lamp - Voltage above normal orshorted to high source
P1040	5099	4	Machine - Oil pressure lamp - Voltage below normal orshorted to low source
P1041	3697	11	Machine - Particle filter lamp - Root cause not known
P1042	624	11	Machine - Amber warning lamp - Root cause not known
P1043	624	3	Machine - Amber warning lamp - Voltage above normalor shorted to high source
P1044	624	4	Machine - Amber warning lamp - Voltage below normalor shorted to low source
P1045	520458	11	Machine - Engine running lamp - Root cause not known
P1046	520458	3	Machine - Engine running lamp - Voltage above normalor shorted to high source
P1047	520458	4	Machine - Engine running lamp - Voltage below normalor shorted to low source
P1048	520459	11	Machine - Multi purpose lamp - Root cause not known
P1049	520459	3	Machine - Multi purpose lamp - Voltage above normal orshorted to high source
P104A	520459	4	Machine - Multi purpose lamp - Voltage below normal orshorted to low source
P104F	51	4	Engine - Throttle valve position - Voltage below normalor shorted to low source
P1050	27	3	Engine - Position EGR valve - Voltage above normal orshorted to high source
P1051	27	4	Engine - Position EGR valve - Voltage below normal orshorted to low source
P1052	27	3	Engine - Position EGR valve - Voltage above normal orshorted to high source
P1053	27	4	Engine - Position EGR valve - Voltage below normal orshorted to low source
P1054	27	6	Engine - Position EGR valve - Current above normal orgrounded circuit
P1055	27	5	Engine - Position EGR valve - Current below normal oropen circuit
P1056	27	5	Engine - Position EGR valve - Current below normal oropen circuit
P1057	27	11	Engine - Position EGR valve - Root cause not known
P1058	27	3	Engine - Position EGR valve - Voltage above normal orshorted to high source
P1059	27	4	Engine - Position EGR valve - Voltage below normal orshorted to low source
P105A	27	11	Engine - Position EGR valve - Root cause not known
P105B	27	2	Engine - Position EGR valve - Data erratic intermittentor incorrect
P105C	27	2	Engine - Position EGR valve - Data erratic intermittentor incorrect
P105D	51	6	Engine - Throttle valve position - Current above normalor grounded circuit
P105E	51	11	Engine - Throttle valve position - Root cause not known
P105F	51	6	Engine - Throttle valve position - Current above normalor grounded circuit
P1060	190	0	Engine - Rotation speed - Data above normaloperational range (Most severe level)
P1061	190	0	Engine - Rotation speed - Data above normaloperational range (Most severe level)
P1062	190	0	Engine - Rotation speed - Data above normaloperational range (Most severe level)

DTC-Code	SPN	FMI	Fault description
P1063	520435	11	Engine - Ouput torque - Root cause not known
P1064	1237	2	Engine - Shutdown override switch - Data erraticintermittent or incorrect
P1067	520491	2	Exhaust aftertreatment - Too many engine starts in tooshort a time - Data erratic intermittent or incorrect
P1068	520433	5	Machine - Resv Lamp - Current below normal or opencircuit
P1069	520433	11	Machine - Resv Lamp - Root cause not known
P106A	520433	3	Machine - Resv Lamp - Voltage above normal orshorted to high source
P106B	520433	4	Machine - Resv Lamp - Voltage below normal or shorted to low source
P106C	5100	11	Machine - Coolant temperature lamp - Root cause notknown
P106D	5100	3	Machine - Coolant temperature lamp - Voltage abovenormal or shorted to high source
P106E	5100	4	Machine - Coolant temperature lamp - Voltage belownormal or shorted to low source
P1070	598	10	Machine - Clutch signal - Abnormal rate of change
P1071	1109	2	Engine - Protection system requested shutdown - Dataerratic intermittent or incorrect
P1072	1109	14	Engine - Protection system requested shutdown -Special instructions
P1075	171	2	Engine - Ambient air temperature sensor - Data erraticintermittent or incorrect
P1076	110	2	Engine - Coolant temperature sensor - Data erraticintermittent or incorrect
P1077	4766	2	Exhaust aftertreatment - Temperature after DOC - Dataerratic intermittent or incorrect
P1078	4765	2	Exhaust aftertreatment - Temperature bevor DOC -Data erratic intermittent or incorrect
P1079	4765	2	Exhaust aftertreatment - Temperature bevor DOC -Data erratic intermittent or incorrect
P107A	1081	11	Machine - Cold start lamp - Root cause not known
P107B	1081	3	Machine - Cold start lamp - Voltage above normal orshorted to high source
P107C	1081	4	Machine - Cold start lamp - Voltage below normal orshorted to low source
P107D	520444	11	Machine - Vehicle speed control lamp - Root cause notknown
P107E	520416	5	Engine - Disc separator - Current below normal or opencircuit
P107F	520416	11	Engine - Disc separator - Root cause not known
P1080	520416	3	Engine - Disc separator - Voltage above normal orshorted to high source
P1081	520416	4	Engine - Disc separator - Voltage below normal orshorted to low source
P1082	520429	2	Engine - Main and Secondary ECU identification - Dataerratic intermittent or incorrect

DTC-Code	SPN	FMI	Fault description
P1083	520430	11	Engine - Exhaust flap failure - Root cause not known
P1085	677	11	Engine - Starter relay - Root cause not known
P1086	6655	11	Machine - ECU power off lamp - Root cause not known
P1087	6655	3	Machine - ECU power off lamp - Voltage above normalor shorted to high source
P1088	6655	4	Machine - ECU power off lamp - Voltage below normalor shorted to low source
P1089	520259	15	Engine - Temperature before engine inlet valve - Dataabove normal operational range (Least severe level)
P108A	520259	16	Engine - Temperature before engine inlet valve - Dataabove normal operational range (Moderately severelevel)
P108B	520259	1	Engine - Temperature before engine inlet valve - Databelow normal operational range (Most severe level)
P108C	107	0	Engine - Air filter differential pressure sensor - Dataabove normal operational range (Most severe level)
P108F	102	2	Engine - Charge air pressure sensor - Data erraticintermittent or incorrect
P1090	102	2	Engine - Charge air pressure sensor - Data erraticintermittent or incorrect
P1091	102	1	Engine - Charge air pressure sensor - Data belownormal operational range (Most severe level)
P1092	51	3	Engine - Throttle valve position - Voltage above normalor shorted to high source
P1093	51	4	Engine - Throttle valve position - Voltage below normalor shorted to low source
P1094	51	11	Engine - Throttle valve position - Root cause not known
P1095	520304	2	Engine - Status throttle valve - Data erratic intermittentor incorrect
P1096	520305	2	Engine - Signal error throttle valve - Data erraticintermittent or incorrect
P1097	520296	31	Engine - Torque reduction TC protection active -Condition exists
P1099	171	16	Engine - Ambient air temperature sensor - Data abovenormal operational range (Moderately severe level)
P109A	171	18	Engine - Ambient air temperature sensor - Data belownormal operational range (Moderately severe level)
P109B	520442	31	Engine - Intake air temperature sensor - Conditionexists
P109C	520443	31	Engine - Intake air temperature sensor not available -Condition exists
P109D	520492	18	Engine - Boost pressure regulation - Data below normaloperational range (Moderately severe level)
P109E	520492	16	Engine - Boost pressure regulation - Data above normaloperational range (Moderately severe level)
P10E0	657	13	Engine - Injector 7 - Out of calibration
P10E1	658	13	Engine - Injector 8 - Out of calibration
P1100	1485	3	Engine - ECU main relay - Voltage above normal orshorted to high source

DTC-Code	SPN	FMI	Fault description
P1101	1485	3	Engine - ECU main relay - Voltage above normal orshorted to high source
P1102	1485	4	Engine - ECU main relay - Voltage below normal orshorted to low source
P1103	1485	4	Engine - ECU main relay - Voltage below normal orshorted to low source
P1104	1485	3	Engine - ECU main relay - Voltage above normal orshorted to high source
P1105	1485	4	Engine - ECU main relay - Voltage below normal orshorted to low source
P1106	629	12	Engine - ECU - Bad intelligent device or component
P1107	629	12	Engine - ECU - Bad intelligent device or component
P1108	629	12	Engine - ECU - Bad intelligent device or component
P1109	629	12	Engine - ECU - Bad intelligent device or component
P110A	629	12	Engine - ECU - Bad intelligent device or component
P110B	629	12	Engine - ECU - Bad intelligent device or component
P110C	629	12	Engine - ECU - Bad intelligent device or component
P110D	629	12	Engine - ECU - Bad intelligent device or component
P110E	629	12	Engine - ECU - Bad intelligent device or component
P110F	629	12	Engine - ECU - Bad intelligent device or component
P1110	629	12	Engine - ECU - Bad intelligent device or component
P1111	629	12	Engine - ECU - Bad intelligent device or component
P1112	629	12	Engine - ECU - Bad intelligent device or component
P1113	629	12	Engine - ECU - Bad intelligent device or component
P1114	629	12	Engine - ECU - Bad intelligent device or component
P1115	629	12	Engine - ECU - Bad intelligent device or component
P1116	629	12	Engine - ECU - Bad intelligent device or component
P1117	629	12	Engine - ECU - Bad intelligent device or component
P1118	629	12	Engine - ECU - Bad intelligent device or component
P1119	629	12	Engine - ECU - Bad intelligent device or component
P111A	629	12	Engine - ECU - Bad intelligent device or component
P111B	629	12	Engine - ECU - Bad intelligent device or component
P111C	629	12	Engine - ECU - Bad intelligent device or component
P111D	629	12	Engine - ECU - Bad intelligent device or component
P111E	629	12	Engine - ECU - Bad intelligent device or component
P111F	629	12	Engine - ECU - Bad intelligent device or component
P1120	629	12	Engine - ECU - Bad intelligent device or component
P1121	629	12	Engine - ECU - Bad intelligent device or component

DTC-Code	SPN	FMI	Fault description
P1122	629	12	Engine - ECU - Bad intelligent device or component
P1123	629	12	Engine - ECU - Bad intelligent device or component
P1124	629	12	Engine - ECU - Bad intelligent device or component
P1125	629	12	Engine - ECU - Bad intelligent device or component
P1126	629	12	Engine - ECU - Bad intelligent device or component
P1127	629	12	Engine - ECU - Bad intelligent device or component
P1128	629	12	Engine - ECU - Bad intelligent device or component
P1129	629	12	Engine - ECU - Bad intelligent device or component
P112A	629	12	Engine - ECU - Bad intelligent device or component
P112B	629	12	Engine - ECU - Bad intelligent device or component
P112C	629	12	Engine - ECU - Bad intelligent device or component
P112D	629	12	Engine - ECU - Bad intelligent device or component
P112E	629	12	Engine - ECU - Bad intelligent device or component
P112F	629	12	Engine - ECU - Bad intelligent device or component
P1130	629	12	Engine - ECU - Bad intelligent device or component
P1131	629	12	Engine - ECU - Bad intelligent device or component
P1132	629	12	Engine - ECU - Bad intelligent device or component
P1133	629	12	Engine - ECU - Bad intelligent device or component
P1134	629	12	Engine - ECU - Bad intelligent device or component
P1135	629	12	Engine - ECU - Bad intelligent device or component
P1136	629	12	Engine - ECU - Bad intelligent device or component
P1137	629	12	Engine - ECU - Bad intelligent device or component
P1138	629	12	Engine - ECU - Bad intelligent device or component
P1139	629	12	Engine - ECU - Bad intelligent device or component
P113A	629	12	Engine - ECU - Bad intelligent device or component
P113B	629	12	Engine - ECU - Bad intelligent device or component
P113C	629	12	Engine - ECU - Bad intelligent device or component
P113D	629	12	Engine - ECU - Bad intelligent device or component
P113E	520370	2	Engine - ECU afterun not waited - Data erraticintermittent or incorrect
P113F	520371	2	Engine - ECU afterun too often not waited - Data erraticintermittent or incorrect
P1140	520372	2	Engine - ECU afterun too often consecutive not waited -Data erratic intermittent or incorrect
P1141	1485	3	Engine - ECU main relay - Voltage above normal orshorted to high source

DTC-Code	SPN	FMI	Fault description
P1142	1485	4	Engine - ECU main relay - Voltage below normal orshorted to low source
P1143	1485	3	Engine - ECU main relay - Voltage above normal orshorted to high source
P1144	1485	4	Engine - ECU main relay - Voltage below normal orshorted to low source
P1145	1485	3	Engine - ECU main relay - Voltage above normal orshorted to high source
P1146	1485	4	Engine - ECU main relay - Voltage below normal orshorted to low source
P1147	1485	3	Engine - ECU main relay - Voltage above normal orshorted to high source
P1148	1485	4	Engine - ECU main relay - Voltage below normal orshorted to low source
P1149	1485	3	Engine - ECU main relay - Voltage above normal orshorted to high source
P114A	1485	4	Engine - ECU main relay - Voltage below normal orshorted to low source
P114B	1485	3	Engine - ECU main relay - Voltage above normal orshorted to high source
P114C	1485	4	Engine - ECU main relay - Voltage below normal orshorted to low source
P114E	1485	4	Engine - ECU main relay - Voltage below normal orshorted to low source
P115A	3513	14	Engine - ECU sensor supply voltage 5 - Specialinstructions
P115A	3513	11	Engine - ECU sensor supply voltage 5 - Root cause notknown
P115B	3513	0	Engine - ECU sensor supply voltage 5 - Data abovenormal operational range (Most severe level)
P115C	3513	6	Engine - ECU sensor supply voltage 5 - Current abovenormal or grounded circuit
P115C	3513	1	Engine - ECU sensor supply voltage 5 - Data belownormal operational range (Most severe level)
P115D	3514	14	Engine - ECU sensor supply voltage 6 - Specialinstructions
P115D	3514	11	Engine - ECU sensor supply voltage 6 - Root cause notknown
P115E	3514	0	Engine - ECU sensor supply voltage 6 - Data abovenormal operational range (Most severe level)
P115F	3514	6	Engine - ECU sensor supply voltage 6 - Current abovenormal or grounded circuit
P115F	3514	1	Engine - ECU sensor supply voltage 6 - Data belownormal operational range (Most severe level)
P1168	520378	11	Machine - MCAN not enough memory - Root cause notknown
P1169	520379	11	Machine - MCANR not enough memory - Root causenot known
P116A	520425	4	Engine - Powerstage on CJ945 - Voltage below normalor shorted to low source
P116A	520425	3	Engine - Powerstage on CJ945 - Voltage above normalor shorted to high source
P116A	520425	5	Engine - Powerstage on CJ945 - Current below normalor open circuit
P116A	520425	12	Engine - Powerstage on CJ945 - Bad intelligent deviceor component
P1173	520437	31	Engine - Replacement fault code triggered by FIDUVMDSM04/V-engine: Main-secondary ECU swapped -Condition exists
P1174	520438	31	Engine - Replacement fault code triggered by FIDUVMDSM04 - Condition exists

DTC-Code	SPN	FMI	Fault description
P1175	520439	31	Engine - Replacement fault code triggered by FIDUVMDSM10 - Condition exists
P1176	520440	31	Engine - Replacement fault code triggered by FIDUVMDSM12 - Condition exists
P1177	520441	31	Engine - Replacement fault code triggered by FIDUVMDSM13 - Condition exists
P1178	520496	11	Engine - Exhaust flap internal fault - Root cause notknown
P1179	520497	11	Engine - Exhaust flap external fault - Root cause notknown
P117A	520498	13	Engine - Exhaust flap learning fault - Out of calibration
P119A	629	12	Engine - ECU - Bad intelligent device or component
P119B	629	12	Engine - ECU - Bad intelligent device or component
P119C	629	12	Engine - ECU - Bad intelligent device or component
P119D	91	14	Machine - Position accelerator pedal - Specialinstructions
P119E	190	2	Engine - Rotation speed - Data erratic intermittent orincorrect
P119F	5357	2	Engine - Fuel injection quantity multiple cylinder - Dataerratic intermittent or incorrect
P11A0	5441	2	Engine - Fuel injection timing error multiple cylinders -Data erratic intermittent or incorrect
P11A1	520281	2	Engine - Injection temperature compensation - Dataerratic intermittent or incorrect
P11A2	5357	2	Engine - Fuel injection quantity multiple cylinder - Dataerratic intermittent or incorrect
P11A3	523612	12	Engine - ECU - Bad intelligent device or component
P11A4	523612	12	Engine - ECU - Bad intelligent device or component
P11A5	523612	12	Engine - ECU - Bad intelligent device or component
P11A6	5357	2	Engine - Fuel injection quantity multiple cylinder - Dataerratic intermittent or incorrect
P11A7	5357	2	Engine - Fuel injection quantity multiple cylinder - Dataerratic intermittent or incorrect
P11A8	5442	2	Engine - Fuel injection pressure error multiple cylinders -Data erratic intermittent or incorrect
P11A9	29	2	Machine - Position accelerator pedal 2 - Data erraticintermittent or incorrect
P11AA	677	2	Engine - Starter relay - Data erratic intermittent orincorrect
P11AB	513	2	Engine - Actual percent totque - Data erratic intermittentor incorrect
P11AC	513	2	Engine - Actual percent totque - Data erratic intermittentor incorrect
P11AD	520250	2	Engine - Function monitoring - Data erratic intermittentor incorrect
P11AE	629	12	Engine - ECU - Bad intelligent device or component
P11AF	629	12	Engine - ECU - Bad intelligent device or component
P11B0	629	12	Engine - ECU - Bad intelligent device or component

DTC-Code	SPN	FMI	Fault description
P11B1	629	12	Engine - ECU - Bad intelligent device or component
P11B2	629	12	Engine - ECU - Bad intelligent device or component
P11B3	629	12	Engine - ECU - Bad intelligent device or component
P11B4	629	12	Engine - ECU - Bad intelligent device or component
P11B5	629	12	Engine - ECU - Bad intelligent device or component
P11B6	629	12	Engine - ECU - Bad intelligent device or component
P11B7	629	12	Engine - ECU - Bad intelligent device or component
P11B8	629	12	Engine - ECU - Bad intelligent device or component
P11B9	629	12	Engine - ECU - Bad intelligent device or component
P11BA	629	12	Engine - ECU - Bad intelligent device or component
P11BB	629	12	Engine - ECU - Bad intelligent device or component
P11BC	629	12	Engine - ECU - Bad intelligent device or component
P11BD	629	12	Engine - ECU - Bad intelligent device or component
P11BE	629	12	Engine - ECU - Bad intelligent device or component
P11BF	629	12	Engine - ECU - Bad intelligent device or component
P11C0	629	12	Engine - ECU - Bad intelligent device or component
P11C1	629	12	Engine - ECU - Bad intelligent device or component
P11C2	629	12	Engine - ECU - Bad intelligent device or component
P11C3	629	12	Engine - ECU - Bad intelligent device or component
P11C4	629	12	Engine - ECU - Bad intelligent device or component
P11C5	629	12	Engine - ECU - Bad intelligent device or component
P11C6	629	12	Engine - ECU - Bad intelligent device or component
P11C7	629	12	Engine - ECU - Bad intelligent device or component
P11C8	629	12	Engine - ECU - Bad intelligent device or component
P11C9	629	12	Engine - ECU - Bad intelligent device or component
P11CA	629	12	Engine - ECU - Bad intelligent device or component
P11CB	629	12	Engine - ECU - Bad intelligent device or component
P11CC	629	12	Engine - ECU - Bad intelligent device or component
P11CD	629	12	Engine - ECU - Bad intelligent device or component
P11CE	629	12	Engine - ECU - Bad intelligent device or component
P11CF	629	12	Engine - ECU - Bad intelligent device or component
P11D0	629	12	Engine - ECU - Bad intelligent device or component

DTC-Code	SPN	FMI	Fault description
P11D1	629	12	Engine - ECU - Bad intelligent device or component
P11D2	629	12	Engine - ECU - Bad intelligent device or component
P11D3	629	12	Engine - ECU - Bad intelligent device or component
P11D4	629	12	Engine - ECU - Bad intelligent device or component
P11D5	629	12	Engine - ECU - Bad intelligent device or component
P11D6	629	12	Engine - ECU - Bad intelligent device or component
P11D7	629	12	Engine - ECU - Bad intelligent device or component
P11D8	629	12	Engine - ECU - Bad intelligent device or component
P11D9	629	12	Engine - ECU - Bad intelligent device or component
P11DA	629	12	Engine - ECU - Bad intelligent device or component
P11DB	629	12	Engine - ECU - Bad intelligent device or component
P11DC	629	12	Engine - ECU - Bad intelligent device or component
P11DD	629	12	Engine - ECU - Bad intelligent device or component
P11DE	629	12	Engine - ECU - Bad intelligent device or component
P11DF	629	12	Engine - ECU - Bad intelligent device or component
P11E0	629	12	Engine - ECU - Bad intelligent device or component
P11E1	629	12	Engine - ECU - Bad intelligent device or component
P11E2	629	12	Engine - ECU - Bad intelligent device or component
P11E3	629	12	Engine - ECU - Bad intelligent device or component
P11E4	629	12	Engine - ECU - Bad intelligent device or component
P11E5	629	12	Engine - ECU - Bad intelligent device or component
P11E6	629	12	Engine - ECU - Bad intelligent device or component
P11E7	629	12	Engine - ECU - Bad intelligent device or component
P11E8	629	12	Engine - ECU - Bad intelligent device or component
P11E9	629	12	Engine - ECU - Bad intelligent device or component
P11EA	629	12	Engine - ECU - Bad intelligent device or component
P11EB	629	12	Engine - ECU - Bad intelligent device or component
P11EC	629	12	Engine - ECU - Bad intelligent device or component
P11ED	629	12	Engine - ECU - Bad intelligent device or component
P11EE	629	12	Engine - ECU - Bad intelligent device or component
P11EF	629	12	Engine - ECU - Bad intelligent device or component
P11F0	629	12	Engine - ECU - Bad intelligent device or component

DTC-Code	SPN	FMI	Fault description
P11F1	629	12	Engine - ECU - Bad intelligent device or component
P11F2	629	12	Engine - ECU - Bad intelligent device or component
P11F3	629	12	Engine - ECU - Bad intelligent device or component
P11F4	629	12	Engine - ECU - Bad intelligent device or component
P11F5	629	12	Engine - ECU - Bad intelligent device or component
P11F6	629	12	Engine - ECU - Bad intelligent device or component
P11F7	629	12	Engine - ECU - Bad intelligent device or component
P11F8	520473	31	Engine - Wrong engine ECU - Condition exists
P1251	520282	7	Exhaust aftertreatment - Lines DPF sensor inverted -Mechanical system not responding or out of adjustment
P1252	520283	14	Engine - Oil change request - Special instructions
P1253	520300	2	Exhaust aftertreatment - Pressure after DPF - Dataerratic intermittent or incorrect
P1254	4781	14	Exhaust aftertreatment - DEF soot load - Specialinstructions
P1255	10156	0	Exhaust aftertreatment - DPF regeneration time - Dataabove normal operational range (Most severe level)
P1256	3735	16	Exhaust aftertreatment - Time Stand Still - Data abovenormal operational range (Moderately severe level)
P1257	3735	0	Exhaust aftertreatment - Time Stand Still - Data abovenormal operational range (Most severe level)
P1258	4766	1	Exhaust aftertreatment - Temperature after DOC - Databelow normal operational range (Most severe level)
P1259	3251	14	Exhaust aftertreatment - DPF differential pressure -Special instructions
P125A	3251	14	Exhaust aftertreatment - DPF differential pressure -Special instructions
P125B	3251	14	Exhaust aftertreatment - DPF differential pressure -Special instructions
P125C	3251	14	Exhaust aftertreatment - DPF differential pressure -Special instructions
P125F	4766	2	Exhaust aftertreatment - Temperature after DOC - Dataerratic intermittent or incorrect
P1260	4766	2	Exhaust aftertreatment - Temperature after DOC - Dataerratic intermittent or incorrect
P1261	3734	0	Exhaust aftertreatment - Time Stand Still - Data abovenormal operational range (Most severe level)
P1262	520254	8	Exhaust aftertreatment - Time Stand Still - Abnormalfrequency or pulse width or period
P1263	520255	2	Exhaust aftertreatment - Lines DPF sensor wrongconected - Data erratic intermittent or incorrect
P1264	520434	14	Exhaust aftertreatment - Condition Stand Still - Specialinstructions
P1265	520472	11	Exhaust aftertreatment - ETV actuator light error - Rootcause not known

DTC-Code	SPN	FMI	Fault description
P1266	520493	15	Engine - PCD power reduction step 1 active - Dataabove normal operational range (Least severe level)
P1267	520494	0	Engine - PCD power reduction step 2 active - Dataabove normal operational range (Most severe level)
P1268	520495	14	Engine - Pre trigger for PCD inducement level 2 active -Special instructions
P1351	3226	0	Exhaust aftertreatment - NOx sensor behind SCR - Dataabove normal operational range (Most severe level)
P1352	3226	2	Exhaust aftertreatment - NOx sensor behind SCR - Dataerratic intermittent or incorrect
P1353	3216	2	Exhaust aftertreatment - NOx sensor infront of SCR -Data erratic intermittent or incorrect
P1354	520286	2	Exhaust aftertreatment - Calculated lambda value - Dataerratic intermittent or incorrect
P1355	7351	0	Exhaust aftertreatment - NOx emissiones after SCR Cat- Data above normal operational range (Most severelevel)
P1356	520287	2	Exhaust aftertreatment - NOx conversion SCR Cat -Data erratic intermittent or incorrect
P1358	520289	14	Exhaust aftertreatment - Emptying DEF supply system -Special instructions
P1359	6875	31	Exhaust aftertreatment - DEF metering pressure -Condition exists
P135A	520290	14	Exhaust aftertreatment - DEF pressure - Specialinstructions
P135B	6875	0	Exhaust aftertreatment - DEF metering pressure - Dataabove normal operational range (Most severe level)
P135C	520291	11	Exhaust aftertreatment - DEF warm up - Root cause notknown
P135D	520292	11	Exhaust aftertreatment - DEF metering valve blocked -Root cause not known
P135E	3226	0	Exhaust aftertreatment - NOx sensor behind SCR - Dataabove normal operational range (Most severe level)
P135F	3226	9	Exhaust aftertreatment - NOx sensor behind SCR -Abnormal update rate timeout
P1360	3226	13	Exhaust aftertreatment - NOx sensor behind SCR - Outof calibration
P1361	3226	31	Exhaust aftertreatment - NOx sensor behind SCR -Condition exists
P1362	3216	0	Exhaust aftertreatment - NOx sensor infront of SCR -Data above normal operational range (Most severelevel)
P1363	3216	9	Exhaust aftertreatment - NOx sensor infront of SCR -Abnormal update rate timeout
P1364	3216	13	Exhaust aftertreatment - NOx sensor infront of SCR -Out of calibration
P1365	3216	31	Exhaust aftertreatment - NOx sensor infront of SCR -Condition exists
P1366	4360	2	Exhaust aftertreatment - Temperature before SCR Cat -Data erratic intermittent or incorrect
P1367	4360	3	Exhaust aftertreatment - Temperature before SCR Cat -Voltage above normal or shorted to high source

DTC-Code	SPN	FMI	Fault description
P1368	4360	4	Exhaust aftertreatment - Temperature before SCR Cat -Voltage below normal or shorted to low source
P136A	3516	1	Exhaust aftertreatment - DEF concentration - Databelow normal operational range (Most severe level)
P136B	524087	11	Machine - DEF error lamp - Root cause not known
P136C	524087	3	Machine - DEF error lamp - Voltage above normal orshorted to high source
P136D	524087	4	Machine - DEF error lamp - Voltage below normal orshorted to low source
P136E	520375	15	Exhaust aftertreatment - SCR crystallisation monitoring -Data above normal operational range (Least severelevel)
P136F	520375	0	Exhaust aftertreatment - SCR crystallisation monitoring -Data above normal operational range (Most severelevel)
P1372	5746	5	Exhaust aftertreatment - DEF metering unit heater relay- Current below normal or open circuit
P1373	5746	3	Exhaust aftertreatment - DEF metering unit heater relay- Voltage above normal or shorted to high source
P1374	5746	4	Exhaust aftertreatment - DEF metering unit heater relay- Voltage below normal or shorted to low source
P1375	4334	2	Exhaust aftertreatment - DEF pump pressure - Dataerratic intermittent or incorrect
P1376	520311	11	Exhaust aftertreatment - DEF supply module heaterover temperature - Root cause not known
P1378	4376	5	Exhaust aftertreatment - DEF reverse valve - Currentbelow normal or open circuit
P1379	4376	3	Exhaust aftertreatment - DEF reverse valve - Voltageabove normal or shorted to high source
P137A	4376	4	Exhaust aftertreatment - DEF reverse valve - Voltagebelow normal or shorted to low source
P137E	520284	15	Engine - Power reduction step 1 active - Data abovenormal operational range (Least severe level)
P1380	5826	14	Exhaust aftertreatment - Power reduction - Specialinstructions
P1381	520285	0	Engine - Power reduction step 2 active - Data abovenormal operational range (Most severe level)
P1383	520293	15	Exhaust aftertreatment - Particle diagnostic powerreduction step 1 active - Data above normal operationalrange (Least severe level)
P1384	520294	14	Exhaust aftertreatment - Particle diagnostic pretriggerpower reduction step 2 active - Special instructions
P1385	520295	0	Exhaust aftertreatment - Particle diagnostic powerreduction step 2 active - Data above normal operationalrange (Most severe level)
P1386	520301	2	Exhaust aftertreatment - NOx conversion efficiency -Data erratic intermittent or incorrect
P1387	520302	2	Exhaust aftertreatment - Voltage for power supply DEFheater - Data erratic intermittent or incorrect
P1388	520303	11	Exhaust aftertreatment - Relay DEF heater - Root causenot known

DTC-Code	SPN	FMI	Fault description
P1389	3226	12	Exhaust aftertreatment - NOx sensor behind SCR - Badintelligent device or component
P138A	3226	31	Exhaust aftertreatment - NOx sensor behind SCR -Condition exists
P138B	3216	12	Exhaust aftertreatment - NOx sensor infront of SCR -Bad intelligent device or component
P138C	3216	31	Exhaust aftertreatment - NOx sensor infront of SCR -Condition exists
P138D	4360	11	Exhaust aftertreatment - Temperature before SCR Cat -Root cause not known
P138F	520375	15	Exhaust aftertreatment - SCR crystallisation monitoring -Data above normal operational range (Least severelevel)
P138F	520375	0	Exhaust aftertreatment - SCR crystallisation monitoring -Data above normal operational range (Most severelevel)
P1390	520373	9	Exhaust aftertreatment - CAN DEF quality sensor -Abnormal update rate timeout
P1391	520374	9	Exhaust aftertreatment - CAN DEF tanktemperature/level sensor - Abnormal update ratetimeout
P1392	3532	3	Exhaust aftertreatment - DEF tank level sensor -Voltage above normal or shorted to high source
P1393	3532	4	Exhaust aftertreatment - DEF tank level sensor -Voltage below normal or shorted to low source
P1394	3031	3	Exhaust aftertreatment - DEF tank temperature -Voltage above normal or shorted to high source
P1395	3031	4	Exhaust aftertreatment - DEF tank temperature -Voltage below normal or shorted to low source
P1396	7540	11	Exhaust aftertreatment - DEF backflow line heater relay- Root cause not known
P1397	5746	11	Exhaust aftertreatment - DEF metering unit heater relay- Root cause not known
P1398	7069	11	Exhaust aftertreatment - DEF pressure line heater relay- Root cause not known
P1399	5491	11	Exhaust aftertreatment - DEF heater relay cable - Rootcause not known
P139A	5746	8	Exhaust aftertreatment - DEF metering unit heater relay- Abnormal frequency or pulse width or period
P139B	520317	8	Exhaust aftertreatment - DEF supply module overtemperature - Abnormal frequency or pulse width orperiod
P139C	520445	2	Machine - DEF pump motor communication - Dataerratic intermittent or incorrect
P139D	520307	11	Exhaust aftertreatment - DEF heater relay overtemperature - Root cause not known
P139E	3520	2	Exhaust aftertreatment - DEF quality sensor - Dataerratic intermittent or incorrect
P139F	3520	2	Exhaust aftertreatment - DEF quality sensor - Dataerratic intermittent or incorrect
P13A0	3520	2	Exhaust aftertreatment - DEF quality sensor - Dataerratic intermittent or incorrect
P13A1	3520	2	Exhaust aftertreatment - DEF quality sensor - Dataerratic intermittent or incorrect
P13A2	3520	13	Exhaust aftertreatment - DEF quality sensor - Out ofcalibration

DTC-Code	SPN	FMI	Fault description
P13A3	3520	2	Exhaust aftertreatment - DEF quality sensor - Dataerratic intermittent or incorrect
P13A4	520436	11	Exhaust aftertreatment - DEF quality sensor - Rootcause not known
P13A5	520436	3	Exhaust aftertreatment - DEF quality sensor - Voltageabove normal or shorted to high source
P13A6	520436	4	Exhaust aftertreatment - DEF quality sensor - Voltagebelow normal or shorted to low source
P13A7	3532	2	Exhaust aftertreatment - DEF tank level sensor - Dataerratic intermittent or incorrect
P13A8	3532	2	Exhaust aftertreatment - DEF tank level sensor - Dataerratic intermittent or incorrect
P13A9	3532	2	Exhaust aftertreatment - DEF tank level sensor - Dataerratic intermittent or incorrect
P13AA	3532	2	Exhaust aftertreatment - DEF tank level sensor - Dataerratic intermittent or incorrect
P13AB	3031	2	Exhaust aftertreatment - DEF tank temperature - Dataerratic intermittent or incorrect
P13AC	3031	2	Exhaust aftertreatment - DEF tank temperature - Dataerratic intermittent or incorrect
P13AD	3031	2	Exhaust aftertreatment - DEF tank temperature - Dataerratic intermittent or incorrect
P13AE	4360	2	Exhaust aftertreatment - Temperature before SCR Cat -Data erratic intermittent or incorrect
P13AF	520489	2	Exhaust aftertreatment - DEF pump temperature - Dataerratic intermittent or incorrect
P13B0	5707	2	Exhaust aftertreatment - DEF pump heater temperature- Data erratic intermittent or incorrect
P13B1	520490	2	Exhaust aftertreatment - DEF pump pressure - Dataerratic intermittent or incorrect
P1452	520321	12	Engine - CAN Main Secondary no communication - Badintelligent device or component
P1453	520322	9	Exhaust aftertreatment - Collective fault on Main ECUtriggered by fault couple coordinator Secondary -Abnormal update rate timeout
P1454	520323	11	Exhaust aftertreatment - SCR diagnostic disabled onMain ECU triggered by fault on Secondary - Root causenot known
P1457	520326	11	Exhaust aftertreatment - SCR system turned off on MainECU triggered by fault on Secondary - Root cause notknown
P1458	520327	11	Exhaust aftertreatment - SCR system turned off/Systemon hold on Main ECU triggered by fault on Secondary -Root cause not known
P1459	520328	11	Exhaust aftertreatment - SCR system turned off/Systemon hold on Main ECU triggered by fault on Secondary -Root cause not known
P145A	520329	11	Exhaust aftertreatment - Standstill forbidden on MainECU - Root cause not known

DTC-Code	SPN	FMI	Fault description
P145B	520330	11	Engine - Power reduction request by 25% on Main ECUtriggered by failure Secondary - Root cause not known
P145C	520331	11	Engine - Power reduction request by 50% on Main ECUtriggered by failure Secondary - Root cause not known
P145D	520332	11	Engine - Collective fault on Main ECU triggered bySoftware-reset failure Secondary - Root cause notknown
P145E	520333	11	Engine- Collective fault on Main ECU triggered by noengine speed signal Secondary - Root cause not known
P145F	520334	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by light failure of ETV Secondary - Root causenot known
P1460	520335	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by severe failure of ETV Secondary - Rootcause not known
P1461	520336	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by DEF CAN sensor failure Secondary - Rootcause not known
P1462	520337	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by NOx sensor downstream failure Secondary- Root cause not known
P1463	520338	11	Exhaust aftertreatment - ETV safe position - Root causenot known
P1464	520339	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by dosing valve failure Secondary - Rootcause not known
P1465	520340	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by Stand Still temperature not reached failureSecondary - Root cause not known
P1466	520341	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by DEF pressure problems Secondary - Rootcause not known
P1467	520342	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by reverting valve failure Secondary - Rootcause not known
P1468	520343	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by DEF back flow line heater failure Secondary- Root cause not known
P1469	520344	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by NOx-Tailpipe emissions too high failureSecondary - Root cause not known
P146A	520345	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by DEF suction line heater failure Secondary -Root cause not known
P146B	520346	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by supply module heater lines failureSecondary - Root cause not known
P146C	520347	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by exhaust pressure upstream SCR failureSecondary - Root cause not known
P146D	520348	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by exhaust temperature upstream SCR failureSecondary - Root cause not known
P146E	520349	11	Exhaust aftertreatment - NCD timer activated on MainECU triggered by fault on Secondary - Root cause notknown
P146F	520350	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by DEF pressure line heater failure Secondary- Root cause not known
P1470	520351	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by DEF pump temperature failure Secondary -Root cause not known

DTC-Code	SPN	FMI	Fault description
P1471	520352	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by DEF heater relais failure Secondary - Rootcause not known
P1472	520353	11	Exhaust aftertreatment - PCD timer activated on MainECU triggered by fault on Secondary - Root cause notknown
P1473	520354	11	Engine - Collective fault on Main ECU triggered bymicrocontroller failure Secondary - Root cause notknown
P1474	520355	11	Engine - Collective fault on Main ECU triggered bysensor supply voltage failure Secondary - Root causenot known
P1475	520356	11	Engine - Collective fault on Main ECU triggered by dataset ID failure Secondary - Root cause not known
P1476	520357	11	Engine - Power reduction request by 25% on Main ECUtriggered by failure Secondary - Root cause not known
P1477	520358	11	Engine - Power reduction request by 50% on Main ECUtriggered by failure Secondary - Root cause not known
P1479	520360	11	Exhaust aftertreatment - NCD reduction fail timeractivated on Main ECU triggered by fault on Secondary -Root cause not known
P147A	520361	11	Exhaust aftertreatment - Standstill change main toafterrun phase Secondary - Root cause not known
P147B	520362	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by temperature upstream of DOC failureSecondary - Root cause not known
P147C	520363	11	Exhaust aftertreatment - power reduction, Stand Stillinhibited, ETV turned off on Main ECU triggered by faulton Secondary - Root cause not known
P147D	520364	11	Engine - Collective fault on Main ECU triggered byKeepAlive error at an external device Secondary - Rootcause not known
P147E	520365	11	Engine - Collective fault on Main ECU triggered bybattery voltage failure Secondary - Root cause notknown
P147F	520366	11	Engine - Collective fault on Main ECU triggered by CANfailure Secondary - Root cause not known
P1480	520367	11	Engine - Collective fault on Main ECU triggered byfunction monitoring failure Secondary - Root cause notknown
P1481	520368	11	Engine - Collective fault on Main ECU triggered bymicrocrontroller hardware failure Secondary - Rootcause not known
P1482	520369	11	Engine - Collective fault on Main ECU triggered by ECUtemperature failure Secondary - Root cause not known
P1483	520320	13	Engine - Main and Secondary ECU software versionmismatch - Out of calibration
P1484	520460	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by differential pressure sensor failureSecondary - Root cause not known
P1485	520461	11	Engine - Collective fault on Main ECU triggered byenvironment pressure sensor failure Secondary - Rootcause not known
P1486	520462	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by DEF-supply system failure Secondary -Root cause not known
P1487	520463	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by NH3 sensor failure Secondary - Root causenot known

DTC-Code	SPN	FMI	Fault description
P1488	520464	11	Engine - Collective fault on Main ECU triggered bycamshaft speed signal failure Secondary - Root causenot known
P148A	520466	11	Engine - Power reduction request by 50% on Main ECUtriggered by failure Secondary - Root cause not known
P148B	520467	11	Engine - Power reduction request by 25% on Main ECUtriggered by failure Secondary - Root cause not known
P148C	520468	11	Engine - Power reduction request by 50% on Main ECUtriggered by failure Secondary - Root cause not known
P148D	520469	11	Exhaust aftertreatment - Collective fault on Main ECUtriggered by SCR crystallization failure Secondary - Rootcause not known
P148E	520470	11	Exhaust aftertreatment - Standstill request fromSecondary ECU to Main ECU - Root cause not known
P148F	520475	11	Engine - Power reduction request by 25% on Main ECUtriggered by failure Secondary - Root cause not known
P1490	520476	11	Exhaust aftertreatment - Deactivation NOx MonitoringSecondary - Root cause not known
P1491	520477	11	Exhaust aftertreatment - Activation of replacement valuefor ETV Secondary - Root cause not known
P1492	520478	11	Exhaust aftertreatment - Deactivation NOx plausibilitycheck Secondary - Root cause not known
P1493	520479	11	Exhaust aftertreatment - Standstill forbidden on MainECU - Root cause not known
P1494	520480	11	Exhaust aftertreatment - Standstill forbidden on MainECU, execution only possible with service tool - Rootcause not known
P1495	520481	11	Engine - Set “FID” on Main ECU - Root cause notknown
P1496	520482	11	Exhaust aftertreatment - Activation of “Performanceintervention” on Main ECU - Root cause not known
P1497	520483	11	Exhaust aftertreatment - Forces SCR supply system on Main ECU in status “hold” - Root cause not known
P1498	520484	11	Exhaust aftertreatment - Collective fault on Main ECU triggered by electrical supply module failure Secondary -Root cause not known
P1499	520485	11	Exhaust aftertreatment - Deactivation DEF dosingadapation on Main ECU - Root cause not known
P149A	520486	11	Exhaust aftertreatment - Deactivation NOx downstreammonitoring on Main ECU - Root cause not known
P149B	520487	13	Engine - Inconsistent dataset on Main and SecondaryECU - Out of calibration
P149C	520488	0	Exhaust aftertreatment - SCR Crystallization - Dataabove normal operational range (Most severe level)
P202A	4366	5	Exhaust aftertreatment - DEF tank heating valve -Current below normal or open circuit
P202B	4366	4	Exhaust aftertreatment - DEF tank heating valve -Voltage below normal or shorted to low source

DTC-Code	SPN	FMI	Fault description
P202C	4366	3	Exhaust aftertreatment - DEF tank heating valve -Voltage above normal or shorted to high source
P203B	1761	0	Exhaust aftertreatment - DEF tank level sensor - Dataabove normal operational range (Most severe level)
P203B	1761	2	Exhaust aftertreatment - DEF tank level sensor - Dataerratic intermittent or incorrect
P203C	3532	4	Exhaust aftertreatment - DEF tank level sensor -Voltage below normal or shorted to low source
P203D	3532	3	Exhaust aftertreatment - DEF tank level sensor -Voltage above normal or shorted to high source
P203F	3532	1	Exhaust aftertreatment - DEF tank level sensor - Databelow normal operational range (Most severe level)
P2047	3361	6	Exhaust aftertreatment - DEF metering unit - Currentabove normal or grounded circuit
P2047	3361	5	Exhaust aftertreatment - DEF metering unit - Currentbelow normal or open circuit
P2048	3361	4	Exhaust aftertreatment - DEF metering unit - Voltagebelow normal or shorted to low source
P2049	3361	3	Exhaust aftertreatment - DEF metering unit - Voltageabove normal or shorted to high source
P204C	4334	4	Exhaust aftertreatment - DEF pump pressure - Voltagebelow normal or shorted to low source
P204D	4334	3	Exhaust aftertreatment - DEF pump pressure - Voltageabove normal or shorted to high source
P205B	3031	1	Exhaust aftertreatment - DEF tank temperature - Databelow normal operational range (Most severe level)
P205B	3031	0	Exhaust aftertreatment - DEF tank temperature - Dataabove normal operational range (Most severe level)
P205B	520319	11	Exhaust aftertreatment - DEF tank temperature error -Root cause not known
P205B	3031	2	Exhaust aftertreatment - DEF tank temperature - Dataerratic intermittent or incorrect
P205C	3031	4	Exhaust aftertreatment - DEF tank temperature -Voltage below normal or shorted to low source
P205D	3031	3	Exhaust aftertreatment - DEF tank temperature -Voltage above normal or shorted to high source
P206A	3520	2	Exhaust aftertreatment - DEF quality sensor - Dataerratic intermittent or incorrect
P207F	3520	1	Exhaust aftertreatment - DEF quality sensor - Databelow normal operational range (Most severe level)
P208A	7107	5	Exhaust aftertreatment - DEF pump - Current belownormal or open circuit
P208B	520306	11	Exhaust aftertreatment - DEF pump motor overtemperature - Root cause not known
P208C	7107	4	Exhaust aftertreatment - DEF pump - Voltage belownormal or shorted to low source

DTC-Code	SPN	FMI	Fault description
P208D	7107	3	Exhaust aftertreatment - DEF pump - Voltage abovenormal or shorted to high source
P209F	520312	11	Exhaust aftertreatment - DEF tank heater overtemperature - Root cause not known
P20B9	4341	5	Exhaust aftertreatment - Heater DEF supply line -Current below normal or open circuit
P20BA	520310	11	Exhaust aftertreatment - DEF suction line heater overtemperature - Root cause not known
P20BB	4341	4	Exhaust aftertreatment - Heater DEF supply line -Voltage below normal or shorted to low source
P20BC	4341	3	Exhaust aftertreatment - Heater DEF supply line -Voltage above normal or shorted to high source
P20BD	4343	5	Exhaust aftertreatment - Heater DEF pressure line -Current below normal or open circuit
P20BE	520309	11	Exhaust aftertreatment - DEF pressure line heater overtemperature - Root cause not known
P20BF	4343	4	Exhaust aftertreatment - Heater DEF pressure line -Voltage below normal or shorted to low source
P20C0	4343	3	Exhaust aftertreatment - Heater DEF pressure line -Voltage above normal or shorted to high source
P20C1	4345	5	Exhaust aftertreatment - Heater DEF return line -Current below normal or open circuit
P20C2	520308	11	Exhaust aftertreatment - DEF backflow line heater overtemperature - Root cause not known
P20C3	4345	4	Exhaust aftertreatment - Heater DEF return line -Voltage below normal or shorted to low source
P20C4	4345	3	Exhaust aftertreatment - Heater DEF return line -Voltage above normal or shorted to high source
P20C5	520471	5	Exhaust aftertreatment - DEF downstream line heater -Current below normal or open circuit
P20C6	520471	11	Exhaust aftertreatment - DEF downstream line heater -Root cause not known
P20C7	520471	4	Exhaust aftertreatment - DEF downstream line heater -Voltage below normal or shorted to low source
P20C8	520471	3	Exhaust aftertreatment - DEF downstream line heater -Voltage above normal or shorted to high source
P20E8	4334	1	Exhaust aftertreatment - DEF pump pressure - Databelow normal operational range (Most severe level)
P20E9	4334	0	Exhaust aftertreatment - DEF pump pressure - Dataabove normal operational range (Most severe level)
P20EE	5304	2	Exhaust aftertreatment - NOx Cat efficiency - Dataerratic intermittent or incorrect
P2100	51	5	Engine - Throttle valve position - Current below normalor open circuit
P2101	51	11	Engine - Throttle valve position - Root cause not known

DTC-Code	SPN	FMI	Fault description
P2102	51	4	Engine - Throttle valve position - Voltage below normalor shorted to low source
P2102	51	4	Engine - Throttle valve position - Voltage below normalor shorted to low source
P2103	51	3	Engine - Throttle valve position - Voltage above normalor shorted to high source
P2103	51	3	Engine - Throttle valve position - Voltage above normalor shorted to high source
P2111	51	7	Engine - Throttle valve position - Mechanical system notresponding or out of adjustment
P2112	51	7	Engine - Throttle valve position - Mechanical system notresponding or out of adjustment
P214A	4360	0	Exhaust aftertreatment - Temperature before SCR Cat -Data above normal operational range (Most severelevel)
P21C2	5491	5	Exhaust aftertreatment - DEF heater relay cable -Current below normal or open circuit
P21C3	5491	4	Exhaust aftertreatment - DEF heater relay cable -Voltage below normal or shorted to low source
P21C4	5491	3	Exhaust aftertreatment - DEF heater relay cable -Voltage above normal or shorted to high source
P2227	108	1	Engine - Ambient pressure sensor - Data below normaloperational range (Most severe level)
P2227	108	0	Engine - Ambient pressure sensor - Data above normaloperational range (Most severe level)
P2227	108	2	Engine - Ambient pressure sensor - Data erraticintermittent or incorrect
P2228	108	4	Engine - Ambient pressure sensor - Voltage belownormal or shorted to low source
P2229	108	3	Engine - Ambient pressure sensor - Voltage abovenormal or shorted to high source
P2264	97	0	Engine - Water in fuel sensor - Data above normaloperational range (Most severe level)
P2266	97	4	Engine - Water in fuel sensor - Voltage below normal orshorted to low source
P2267	97	3	Engine - Water in fuel sensor - Voltage above normal orshorted to high source
P226B	102	16	Engine - Charge air pressure sensor - Data abovenormal operational range (Moderately severe level)
P226B	102	0	Engine - Charge air pressure sensor - Data abovenormal operational range (Most severe level)
P229F	3226	2	Exhaust aftertreatment - NOx sensor behind SCR - Dataerratic intermittent or incorrect
P22FF	4360	1	Exhaust aftertreatment - Temperature before SCR Cat -Data below normal operational range (Most severelevel)
P242F	3720	16	Exhaust aftertreatment - DPF ash load - Data abovenormal operational range (Moderately severe level)

DTC-Code	SPN	FMI	Fault description
P244A	3251	18	Exhaust aftertreatment - DPF differential pressure -Data below normal operational range (Moderatelysevere level)
P244A	3251	1	Exhaust aftertreatment - DPF differential pressure -Data below normal operational range (Most severelevel)
P244B	3251	16	Exhaust aftertreatment - DPF differential pressure -Data above normal operational range (Moderatelysevere level)
P244B	3251	0	Exhaust aftertreatment - DPF differential pressure -Data above normal operational range (Most severelevel)
P2454	3251	4	Exhaust aftertreatment - DPF differential pressure -Voltage below normal or shorted to low source
P2455	3251	3	Exhaust aftertreatment - DPF differential pressure -Voltage above normal or shorted to high source
P2456	3251	2	Exhaust aftertreatment - DPF differential pressure -Data erratic intermittent or incorrect
P245F	520300	18	Exhaust aftertreatment - Pressure after DPF - Databelow normal operational range (Moderately severelevel)
P245F	520300	16	Exhaust aftertreatment - Pressure after DPF - Dataabove normal operational range (Moderately severelevel)
P2463	4781	16	Exhaust aftertreatment - DEF soot load - Data abovenormal operational range (Moderately severe level)
P2463	4781	0	Exhaust aftertreatment - DEF soot load - Data abovenormal operational range (Most severe level)
P24E1	4377	2	Exhaust aftertreatment - NH3 sensor - Data erraticintermittent or incorrect
P24E9	4382	2	Exhaust aftertreatment - NH3 sensor heater - Dataerratic intermittent or incorrect
P250A	98	2	Engine - Oil level - Data erratic intermittent or incorrect
P250A	98	31	Engine - Oil level - Condition exists
P250A	98	2	Engine - Oil level - Data erratic intermittent or incorrect
P250B	98	31	Engine - Oil level - Condition exists
P250E	98	14	Engine - Oil level - Special instructions
P2541	94	4	Engine - Fuel low pressure sensor - Voltage belownormal or shorted to low source
P2542	94	3	Engine - Fuel low pressure sensor - Voltage abovenormal or shorted to high source
P2560	111	1	Engine - Coolant level sensor - Data below normaloperational range (Most severe level)
P2604	729	12	Engine - Preheating relay - Bad intelligent device orcomponent
P2604	729	5	Engine - Preheating relay - Current below normal oropen circuit
P2604	729	12	Engine - Preheating relay - Bad intelligent device orcomponent
P260E	3697	4	Machine - Particle filter lamp - Voltage below normal orshorted to low source

DTC-Code	SPN	FMI	Fault description
P260E	3697	3	Machine - Particle filter lamp - Voltage above normal orshorted to high source
P268A	651	13	Engine - Injector 1 - Out of calibration
P26DF	3512	14	Engine - ECU sensor supply voltage 4 - Specialinstructions
P26DF	3512	11	Engine - ECU sensor supply voltage 4 - Root cause notknown
P26E0	3512	6	Engine - ECU sensor supply voltage 4 - Current abovenormal or grounded circuit
P26E0	3512	1	Engine - ECU sensor supply voltage 4 - Data belownormal operational range (Most severe level)
P26E1	3512	0	Engine - ECU sensor supply voltage 4 - Data abovenormal operational range (Most severe level)
P2D87	1071	11	Engine - Fan drive output - Root cause not known
U0010	1231	14	Machine - CAN - Special instructions
U0028	639	14	Machine - CAN - Special instructions
U1700	520261	9	Exhaust aftertreatment - CAN communication to NOxsensor before Cat - Abnormal update rate timeout
U1704	520265	9	Exhaust aftertreatment - CAN communication to NOxsensor after Cat - Abnormal update rate timeout
U170C	1669	14	Machine - CAN - Special instructions
U170D	520252	2	Exhaust aftertreatment - CAN control message - Dataerratic intermittent or incorrect
U170E	520269	2	Machine - CAN Engine start (GeraBox) checksum -Data erratic intermittent or incorrect
U170F	520270	2	Machine - CAN Engine start (Vehicle controller)checksum - Data erratic intermittent or incorrect
U1710	4207	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U1711	4207	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U1712	4207	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U1713	4207	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U1715	523212	9	Engine - CAN engine protection - Abnormal update ratetimeout
U1716	523741	14	Machine - CAN shut down request from engine shutdown - Special instructions
U1717	523240	9	Engine - CAN Functional mode control - Abnormalupdate rate timeout
U1718	520253	2	Exhaust aftertreatment - CAN control message - Dataerratic intermittent or incorrect
U1719	520271	2	Machine - CAN Engine start (GeraBox) rolling counter -Data erratic intermittent or incorrect
U171A	520272	2	Machine - CAN Engine start (Vehicle controller) rollingcounter - Data erratic intermittent or incorrect

DTC-Code	SPN	FMI	Fault description
U171B	4206	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U171C	4206	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U171D	4206	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U171E	4206	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U1720	520273	2	Machine - CAN Engine start (GeraBox) - Data erraticintermittent or incorrect
U1721	520274	9	Machine - CAN Engine start (GeraBox) - Abnormalupdate rate timeout
U1722	520275	2	Machine - CAN Engine start (Vehicle controller) - Dataerratic intermittent or incorrect
U1723	520276	9	Machine - CAN Engine start (Vehicle controller) -Abnormal update rate timeout
U1725	520278	9	Machine - CAN ETV actuator - Abnormal update ratetimeout
U1726	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U1727	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U1728	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U1729	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U172A	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U172B	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U172C	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U172D	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U172E	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U172F	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U1730	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U1731	3349	0	Machine - CAN torque rotation speed control - Dataabove normal operational range (Most severe level)
U1732	523982	0	Engine - Power stage diagnostic - Data above normaloperational range (Most severe level)
U1733	523982	1	Engine - Power stage diagnostic - Data below normaloperational range (Most severe level)

DTC-Code	SPN	FMI	Fault description
U1734	520256	9	Exhaust aftertreatment - CAN control message -Abnormal update rate timeout
U1737	520380	14	Machine - Exhaust aftertreatment CAN shortcut -Special instructions
U1738	520381	14	Machine - Main and Secondary CAN shortcut - Specialinstructions
U1739	520382	14	Machine - Engine CAN shortcut - Special instructions
U173A	520383	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U173B	520384	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U173C	520385	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U173D	520386	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U173E	520387	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U173F	520388	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1740	520389	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1741	520390	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1742	520391	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1743	520392	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1744	520393	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1745	520394	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1746	520395	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1747	520396	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1748	520397	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1749	520398	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U174A	520399	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U174B	520400	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U174C	520401	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U174D	520402	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U174E	520403	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U174F	520404	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1750	520405	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1751	520406	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1752	520407	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1753	520408	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1754	520409	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1755	520410	9	Engine - CAN Main Secondary - Abnormal update ratetimeout

DTC-Code	SPN	FMI	Fault description
U1756	520411	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1757	520412	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U1758	520413	2	Engine - CAN Main Secondary, ECU checksum - Dataerratic intermittent or incorrect
U1759	520414	2	Engine - CAN Main Secondary, time synchrounuslyprivate CAN - Data erratic intermittent or incorrect
U175A	520415	2	Engine - CAN Main Secondary, ECU rolling counter -Data erratic intermittent or incorrect
U175C	520431	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U175D	520432	9	Engine - CAN Main Secondary - Abnormal update ratetimeout
U175E	3349	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U175F	3349	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U1760	3349	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U1761	3349	2	Machine - CAN torque rotation speed control - Dataerratic intermittent or incorrect
U1762	520446	9	Machine - CAN-Receive-Frame ComMS_SWS10_MRcv- Abnormal update rate timeout
U1763	520447	9	Machine - CAN-Receive-Frame ComMS_SWS13_SRcv- Abnormal update rate timeout
U1764	520448	9	Machine - CAN-Receive-Frame ComMS_SWS14_SRcv- Abnormal update rate timeout
U1765	520449	9	Machine - CAN-Receive-Frame ComMS_SWS15_SRcv- Abnormal update rate timeout
U1766	520450	9	Machine - CAN-Receive-Frame ComMS_SWS16_SRcv- Abnormal update rate timeout
U1767	520451	9	Machine - CAN-Receive-Frame ComMS_SWS17_SRcv- Abnormal update rate timeout
U1768	520452	9	Machine - CAN-Receive-Frame ComMS_SWS18_SRcv- Abnormal update rate timeout
U1769	520453	9	Machine - CAN-Receive-Frame ComMS_SWS19_SRcv- Abnormal update rate timeout
U176A	520454	9	Machine - CAN-Receive-Frame ComMS_SWS20_SRcv- Abnormal update rate timeout
U176B	520455	9	Machine - CAN-Receive-Frame ComMS_SWS7_MRcv- Abnormal update rate timeout
U176C	520456	9	Machine - CAN-Receive-Frame ComMS_SWS8_MRcv- Abnormal update rate timeout
U176D	520457	9	Machine - CAN-Receive-Frame ComMS_SWS9_MRcv- Abnormal update rate timeout
U1770	520314	9	Machine - CAN ETV actuator Secondary - Abnormalupdate rate timeout

DTC-Code	SPN	FMI	Fault description
U1771	1638	2	Machine - Hydraulic oil temperature - Data erraticintermittent or incorrect
U1772	1638	9	Machine - Hydraulic oil temperature - Abnormal updaterate timeout
U1773	520313	9	Machine - CAN ETV actuator - Abnormal update ratetimeout
U3003	168	4	Machine - Battery voltage - Voltage below normal orshorted to low source
U3003	168	3	Machine - Battery voltage - Voltage above normal orshorted to high source
U3003	168	1	Machine - Battery voltage - Data below normaloperational range (Most severe level)
U3003	168	0	Machine - Battery voltage - Data above normaloperational range (Most severe level)
U3003	168	0	Machine - Battery voltage - Data above normaloperational range (Most severe level)
U3003	168	1	Machine - Battery voltage - Data below normaloperational range (Most severe level)

MEMO

OTHER SYMPTOMS

For symptoms not included in the table below or if the problem persists after the proper remedies have been taken, consult your sales or service dealer.

Symptoms	Major causes	Remedies
Left and right operating levers do not move smoothly	• Insufficient grease on the left and right operating levers	• Grease the levers. Refer to page 5-78.
Travel levers, blade lever and pedals do not move smoothly	• Insufficient grease on travel levers, blade lever and pedals	• Grease the levers and pedals. Refer to page 5-78.
Operation of hoe attachment, dozer blade, auxiliary hydraulics, slewing or traveling is not possible.	• Safety lock lever is raised (locked)	• Lower (release) the safety lock lever. Refer to page 2-65.
	• Fuse is blown	• Replace the fuse. Refer to page 6-7.
Digging force is insufficient	• Hydraulic oil level too low	• Add to the specified level. Refer to page 5-28.
	• Hydraulic oil is not warm enough	• Perform the warm-up. Refer to page 3-10.
	• Air cleaner is clogged	• Clean the air cleaner. Refer to page 5-30.
	• Hydraulic oil is not of suitable type	• Replace the hydraulic oil. Refer to page 5-68.
Traveling is not possible or not smooth	• Stones or foreign objects are stuck	• Remove the foreign object.
Machine veers to the right/left	• Stones or foreign objects are stuck	• Remove the foreign object.
	• Crawler belt tension is faulty.	• Check and adjust (ask your sales or service dealer). Refer to page 5-40.

Symptoms	Major causes	Remedies
Travel speed cannot be changed	• Fuse is blown	• Replace the fuse. Refer to page 6-7.
Slewing is not possible or not smooth	• Insufficient grease on slew bearing	• Grease the bearing. Refer to page 5-54.
Hydraulic oil temperature is too high	• Hydraulic oil level too low	• Add up to the specified level. Refer to page 5-28.
Starter motor turns but engine does not start	• Insufficient fuel	• Add fuel. Refer to page 5-27.
	• Air in fuel system	• Bleed air. Refer to page 6-11.
	• Water in fuel system	• Drain water. Refer to page 5-42.
	• Fuel is frozen.	• Warm the fuel pipe with hot water or wait until the ambient temperature becomes high.
	• Engine control system is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Fuel line is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Preheating device is faulty.	• Adjust or repair (ask your sales or service dealer).
Crawlers come off	• Crawlers too loose	• Check and adjust (ask your sales or service dealer). Refer to page 5-40.

Symptoms	Major causes	Remedies
Engine exhaust is white or bluish	• Excessive engine oil	• Adjust to the specified level. Refer to page 5-24.
	• Insufficient engine warm-up.	• Perform the warm-up operation. Refer to page 3-6.
	• Engine control system is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Fuel line is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Prolonged idling (approx. two hours or more)	• Increase the engine RPM and check for smoke.
	• Poor fuel	• Replace the fuel.
Engine exhaust is occasionally black	• Air cleaner is clogged	• Clean the air cleaner. Refer to page 5-30.
	• Engine control system is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Fuel line is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Clogging in the exhaust line.	• Adjust or repair (ask your sales or service dealer).
Irregular noise is produced from the engine (combustion or mechanical noise)	• Low quality fuel is being used	• Replace the fuel.
	• Engine is overheating	• Refer to page 6-3.
	• Damage inside the muffler	• Replace the muffler. For replacement, ask your sales or service dealer.
The display is not shown when the starter key is turned to the ON position.	• The display is failed to activate.	• Disconnect the battery terminal and connect it again.

LOWERING THE BOOM TO THE GROUND

If the hoe attachment must be lowered to the ground while the engine is stopped, use the following procedure.

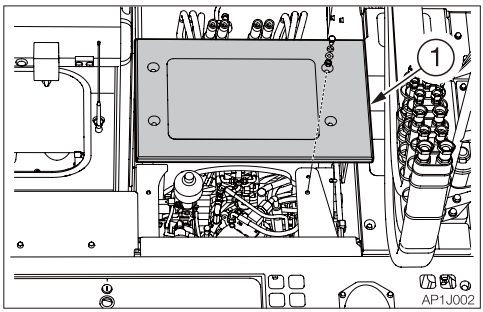
Procedure 1 (when engine can be started)
Perform this operation within 10 minutes after the engine stopping.

1. Sit at the operator's seat.
2. Turn the starter switch to the ON position.
3. Lower the safety lock lever to the unlock position
4. Slowly push the operating lever forward to lower the boom.

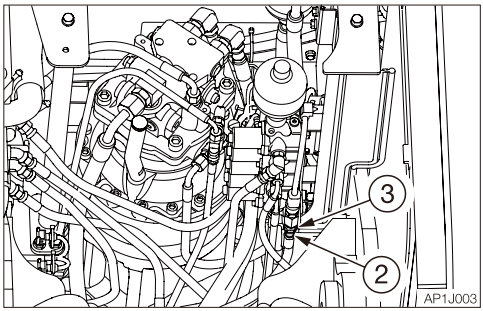
Procedure 2 (when engine cannot be started)
This operation is dangerous and requires experience. Ask your sales or service dealer for it.

⚠ WARNING

- **Stop the engine and allow the machine to cool down before performing maintenance.**
  - **The engine and the hydraulic system and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.**
  - **The hydraulic oil is also hot and under high pressure immediately after the engine is stopped.**
    Be careful when loosening the caps or plugs. Working on the machine under these conditions could result in burns or injuries due to the hot oil spurting out.
- **Keep away from the working area when the hoe attachment is lowered. You may be hit by dirt falling out of the bucket or the hoe attachment as it drops.**
- **Stand in a position away from danger of lowering boom and loosen the hose nut. Otherwise, you could be hit by the boom.**
- **Do not loosen or remove the hoses not located in the specified places. Oil may spurt out if wrongly handled.**
- **When performing maintenance on the machine, clean up the foot area and strictly observe the following so as not to fall:**
  - **Do not spill oil or grease.**
  - **Do not leave tools scattered around.**
  - **Watch your step when walking.**
- **Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.**



1. Remove the cover (1).



2. Place a pan under the hose to catch the waste oil.
3. Hold the hose fitting (2) with a wrench and loosen the hose nut (3) with another wrench.
4. The oil in the boom cylinder is drained and the hoe attachment is lowered.
5. After the hoe attachment is lowered to the ground, check the safety and stability of the machine.
6. Hold the hose fitting (2) with a wrench and tighten the hose nut (3) with another wrench.
   · Tightening torque: 31.4 N·m (23.1 ft-lb.)

TOWING

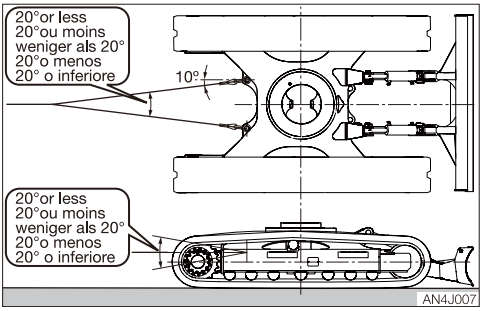
⚠ WARNING

When towing, serious injury or death could result, if performed incorrectly or the wire rope being used is inappropriate or not properly inspected.

- **It becomes dangerous if the wire rope breaks or becomes disengaged. Use a wire rope appropriate for the required tractive force.**
- **Do not use a wire rope that is kinked, twisted or otherwise damaged.**
- **Do not apply heavy loads abruptly to the wire rope.**
- **Wear safety gloves when handling the wire rope.**
- **Make sure there is an operator on the machine being towed as well as on the machine that is towing.**
- **Never tow on slopes.**
- **Do not let anyone come near to the wire rope while towing.**

IMPORTANT: Do not tow a machine if its engine does not start or if the machine does not run. Doing so could damage the machine being towed.
When recovering the machine gets stuck in the mud, lift the machine, or contact a Takeuchi sales or service dealer.

Towing the machine (if engine can be started and travel motor runs normally)
Use the procedure described below to tow heavy objects or the machine itself if it should get stuck in the mud and not be able to get out on its own.



- Permissible forces: 228 kN (51254 lbf)

1. Attach the wire rope to the shackle (1).
2. Fasten the shackle (1) to the towing hole (2).
3. Make sure that the wire rope is at a cone angle of 20° or less to the travel frame.
4. Move the machine to tension the wire rope.
5. Move the machine at a low speed of 2 km/h (1.24 mph) or less to a place (convenient location for repair) a short distance from the site.

IF THE CAB IS DAMAGED

⚠ WARNING

Immediately replace the damaged cab. Serious injury or death may occur if the machine is operated with damaged cab. Do not operate the machine until the replacement is complete. Do not try to repair the damaged cab by welding. Doing so could endanger the safety of the cab.

Cab part number: 05786-00161

<Applicable machine models 514901229 or later>

EXHAUST GAS CONTROL SYSTEM ERROR

ERROR CODE LIST

If the exhaust gas control system detects an error, the ECM error warning lamp flashes and the following error codes appear.
If an error code appears, immediately repair the fault part detected, or consult your sales or service dealer for help.

N: NCD
P: PCD
NCD: NOx Control Diagnostic system
PCD: Particulate Control Diagnostic system

KWP-Code	SPN	FMI	Error details	PCD or NCD Error	Limited engine (Induce-ment)
129	3224	2	DLC Error of CAN-Receive-Frame AT1IG1Vol; NOx sensor.	N	√
130	3224	9	Timeout Error of CAN-Receive-Frame AT1IG1Vol; NOx sensor.	N	√
134	523939	9	Broadcast Announce Message of the calibration message of the upstream catalytic NOx sensor has failed.	N	√
138	3234	2	DLC Error of CAN-Receive-Frame AT1O1Vol NOx	N	√
139	3234	9	Timeout Error of CAN-Receive-Frame AT1OG1Vol.	N	√
141	523942	9	Calibration message 1 of the after catalyst NOx sensor has failed.	N	√
168	523935	12	Timeout Error of CAN-Transmit-Frame EEC3VOL1; Engine send messages	N	√
169	523936	12	Timeout Error of CAN-Transmit-Frame EEC3VOL2; Engine send messages	N	√
417	171	3	Sensor error SCR-System environment temperature; DPF-System air inlet temperature; signal range check high	N	√
418	171	4	Sensor error SCR-System environment temperature; DPF-System air inlet temperature; signal range check low	N	√
795	411	3	Sensor error differential pressure Venturi unit (EGR), signal range check low.	N	√
796	411	4	Sensor error differential pressure Venturi unit (EGR), signal range check high.	N	√

KWP-Code	SPN	FMI	Error details	PCD or NCD Error	Limited engine (Induce-ment)
807	3253	2	Differential pressure DPF, plausibility error	P	√
809	3251	0	Differential pressure DPF maximum value is exceeded	P	√
810	3251	0	Differential pressure sensor across DPF exceeds warning high limit	P	√
812	3251	1	Differential pressure DPF, pressure below lower shutoff threshold.	P	√
813	3251	1	Differential pressure DPF, pressure below lower warning threshold.	P	√
814	3253	3	Electrical error differential pressure B58 (DPF). (Signal range check high)	P	√
815	3253	4	Electrical error differential pressure (DPF). Signal range check low.	P	√
849	1176	3	Pressure sensor upstream turbine, signal range check (SRC) high.	N	√
850	1176	4	Pressure sensor upstream turbine, signal range check (SRC) low.	N	√
925	523720	8	DEF supply module heater temperature; duty cycle in failure range.	N	√
926	523720	8	DEF supply module heater temperature; duty cycle in invalid range.	N	√
927	523721	11	Urea supply module temperature measurement not available.	N	√
928	523722	8	DEF supply module PWM signal; period outside valid range.	N	√
929	523722	8	Detect faulty PWM signal from Supply Module.	N	√
930	523721	8	DEF supply module temperature; duty cycle in failure range.	N	√
931	523721	8	Urea supply module temperature; duty cycle in invalid range.	N	√
1014	51	6	Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8). Signal range check high.	N	
1015	520521	5	Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); signal range check low.	N	
1016	51	7	Actuator position for EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8) not plausible.	N	
1022	51	6	Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); signal range check high	N	
1023	51	5	Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); signal range check low	N	
1024	51	3	Position sensor error of actuator EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8). Signal range check high.	N	
1025	51	4	Position sensor error actuator EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8). Signal range check low.	N	

KWP-Code	SPN	FMI	Error details	PCD or NCD Error	Limited engine (Induce-ment)
1026	4769	2	Temperature downstream DOC, plausibility error	P	
1034	4769	3	Sensor error exhaust gas temperature downstream (DOC); signal range check high	P	
1035	4769	4	Sensor error exhaust gas temperature downstream (DOC); signal range check low	P	
1036	4768	2	Temperature upstream DOC, plausibility error	P	
1044	4768	3	Electrical error exhaust gas temperature upstream (DOC); signal range check high	P	
1045	4768	4	Electrical error exhaust gas temperature upstream (DOC); signal range check low	P	
1070	4360	1	Sensed exhaust temperature before SCR-Cat is < physical low limit	N	√
1072	4361	3	Sensor error DEF catalyst exhaust gas temperature upstream; signal range check high	P, N	√
1073	4361	4	Sensor error DEF catalyst exhaust gas temperature upstream; signal range check low	P, N	√
1075	3361	6	DEF dosing valve; power at the end of injection too high	N	√
1077	3361	3	DEF dosing valve; short circuit to battery on low side	N	√
1078	3361	3	DEF dosing valve; short circuit to battery or open load on high side	N	√
1079	3361	4	Urea dosing valve; short circuit to ground or open load on low side	N	√
1080	3361	4	DEF dosing valve; short circuit on high side	N	√
1117	523632	11	Pump motor not available for actuation	N	√
1118	4375	5	Urea pump motor; open load	N	√
1121	4375	4	Urea pump motor; short circuit to ground	N	√
1122	4334	0	Supply module DEF, DEF pressure above upper physical threshold	N	√
1127	523632	3	Sensor error urea pump pressure; signal range check high	N	√
1128	523632	4	Sensor error urea pump pressure; signal range check low	N	√
1129	4376	5	SCR reversal valve; open load	N	√
1131	4376	3	SCR reversal valve; short circuit to battery	N	√
1132	4376	4	SCR reversing valve; short circuit to ground	N	√
1135	3031	0	DEF tank, DEF temperature in DEF tank is too high.	N	√
1136	3031	1	DEF tank, DEF temperature below lower physical threshold	N	

KWP-Code	SPN	FMI	Error details	PCD or NCD Error	Limited engine (Induce-ment)
1223	51	5	Actuator EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); open load	N	
1224	51	6	Actuator EGR-Valve (2.9;3.6) or Throttle-Valve (6.1,7.8); over current	N	
1226	51	3	EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to battery	N	
1227	51	3	EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to battery	N	
1228	51	4	EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to ground	N	
1229	51	4	EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to ground	N	
1230	51	6	Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); Overload by short-circuit	N	
1231	51	11	Power stage over temperature due to high current.	N	
1232	51	4	Actuator EGR valve (2.9;3.6) or throttle valve (4.1;6.1;7.8); Voltage below threshold.	N	
1241	523986	4	UB6; Short circuit to ground actuator relay 6	N	√
1423	51	0	Warning threshold for an internal actuator error exceeded, <4L EGR.actuator and >4L Air Intake Flap	N	
1424	51	1	Shut off threshold for an internal actuator error exceeded, <4L EGR.actuator and >4L Air Intake Flap	N	
1533	524074	9	NOx sensor downstream SCR-CAT, sensor internally open load	N	√
1534	524075	11	NOx sensor downstream SCR-CAT, sensor internally short circuit	N	√
1535	524076	9	NOx sensor upstream SCR-CAT, sensor internally open line	N	√
1536	524077	11	NOx sensor upstream SCR-CAT, sensor internally short circuit	N	√
1537	524078	9	NOx sensor downstream SCR-CAT, lambda value above upper physical threshold	N	√
1539	524080	9	NOx sensor upstream SCR-CAT, lambda value above upper physical threshold	N	√
1566	524065	1	Pressure sensor upstream SCR-CAT, pressure below lower physical threshold	N	√
1569	524065	3	Pressure sensor upstream SCR-CAT; short circuit battery or open load	P, N	√
1570	524065	4	Pressure sensor upstream SCR-CAT; short circuit ground	P, N	√

KWP-Code	SPN	FMI	Error details	PCD or NCD Error	Limited engine (Induce-ment)
1582	524067	1	DEF supply module, heater temperature below lower physical threshold	N	√
1586	524067	1	DEF supply module, temperature below lower physical threshold	N	√
1598	524065	2	Pressure sensor upstream SCR-CAT, plausibility error	P, N	√
1752	2791	7	EGR actuator, actuator blocked	N	√
1753	2791	2	EGR actuator, CAN error	N	√
1755	2791	12	EGR Actuator, internal electrical fault	N	√
1757	2791	6	EGR actuator current is above maximum threshold	N	√
1758	2791	3	EGR actuator supply voltage is above the maximum threshold	N	√
1759	2791	4	EGR actuator supply voltage is below minimum threshold.	N	√
1761	2791	7	EGR actuator, broken spring detected.	N	√
1858	524147	7	SCR-System, reverting valve blocked	N	√
1859	524175	0	SCR-CAT, NOx emissions above maximum threshold	N	√
1864	524178	7	SCR System, DEF pressure out of range	N	√
1866	4334	2	DEF supply module pressure, plausibility error	N	√
1867	524067	2	Supply module heater temperature, plausibility error	N	√
1868	524067	2	Supply module temperature, plausibility error	N	√
1874	524152	2	Urea Quality Sensor; Timeout CAN message	N	√
1875	524153	2	Urea tank level & urea tank temperature via CAN bus, timeout of CAN message	N	√
1895	3519	12	DEF tank temperature, temperature too high	N	√
1896	3520	3	DEF quality sensor, short circuit to battery or open load	N	√
1897	3520	4	DEF quality sensor, short circuit to ground	N	√
1898	3519	3	DEF quality sensor, internal temperature sensor short circuit to battery or open load	N	√
1899	3519	4	DEF quality sensor, internal temperature sensor short circuit to ground	N	√
1904	3520	2	DEF quality sensor, bad DEF quality detected or no DEF measuring possible.	N	√
1905	3520	8	DEF quality sensor, measurement conditions not fulfilled	N	√

KWP-Code	SPN	FMI	Error details	PCD or NCD Error	Limited engine (Induce-ment)
1908	3519	13	Temperature at UQS invalid	N	√
1909	4365	12	Urea Tank Temperature is above the warning threshold	N	√
1910	3532	13	DEF quality sensor, tank level; DEF level out of physical range	N	√
1911	3532	3	The DEF Level at UQS out of max. physical range	N	√
1912	3532	4	Quality at UQS out of min. physical range	N	√
1913	4365	13	DEF quality sensor, tank temperature; Temperature out of physical range	N	√
1914	4365	3	DEF quality sensor, tank temperature; Short circuit to battery or open load	N	√
1915	4365	4	DEF quality sensor, tank temperature; Short circuit to ground	N	√
2011	4171	2	Dynamic temperature check of temp before SCR	P, N	√
2013	524147	13	Set together with DFC_SCRCoBldUpLoPres. DFC_SCRCoBldUpLoPresRst is only used for inducement purposes. It ensures that legal inducement is working correctly.	N	√
2014	3520	1	Bad DEF quality	N	√
2032	411	2	Insufficient change in EGR venturi signal.	N	√

NOX CONTROL DIAGNOSTIC SYSTEM (NCD)

The NCD system warns the operator of any error detected by flashing the warning lamp and displaying an engine error code. The engine output is limited depending on the type of fault.

PARTICULATE CONTROL DIAGNOSTIC SYSTEM (PCD)

The PCD system warns the operator of any error detected in the particulate after-treatment system such as the DPF, by using the warning lamp and displaying an engine error code.

LIMITING THE ENGINE OUTPUT

If the exhaust gas control system detects an error, the engine output is limited depending on the type of fault.
Note: If the time interval between the fault repairing and error detecting is short, the regular operation may be executed with a shorter pre operation.

Pre operation: If an error is detected, the engine torque becomes limited.
Regular operation: If the pre operation continues, the regular operation is activated to forcibly set the engine speed to low idle. The regular operation continues until the error is resolved.

SPECIFICATIONS



BASIC SPECIFICATIONS

Type				Mono boom	2-Piece boom
MASS					
Operating mass	kg (lb)	Rubber crawlers		15420 (33995)	16050 (35384)
		Steel crawlers		15520 (34215)	16150 (35604)
PERFORMANCE					
Bucket capacity (Standard bucket)	m^3 (cu. ft.)	Heaped		0.45 (15.89)	
		Struck		0.34 (12.01)	
Slew speed	min^{-1} (rpm)			11 (11)	
Travel speed	km/h (mph)	Rubber crawlers	1st	2.9 (1.80)	
			2nd	5.5 (3.42)	
		Steel crawlers	1st	2.7 (1.68)	
			2nd	5.1 (3.17)	
Gradeability	(degrees)			35	
Ground pressure	kPa (psi)	Rubber crawlers		45.4 (6.58)	47.3 (6.86)
		Steel crawlers		46.2 (6.7)	48.1 (6.97)
ENGINE					
Manufacturer and model				DEUTZ TCD3.6L4	
Rated output	(ISO 14396)	kW/min^{-1} (hp/rpm)		85/2000 (113.9/2000)	
Displacement		ml (cu.in.)		3621 (221)	
Amount of CO_2 emission****		g/kWh		742.9***	
Starter		V-kW		24-4.0	
Alternator		V-kW		28-2.24	
Battery (IEC 60095-1)		V-A·h		12-92 X 2	
CCA		A		835	

*: Applicable machine models 514800713 or later
**: Applicable machine models 514901229 or later
***: Applicable machine models 514901229 or later
****: The amount of CO_2 emission refers to the value obtained by testing the parent engine representing the engine type (engine family member) being used; it shall not guarantee the performance of the machine.

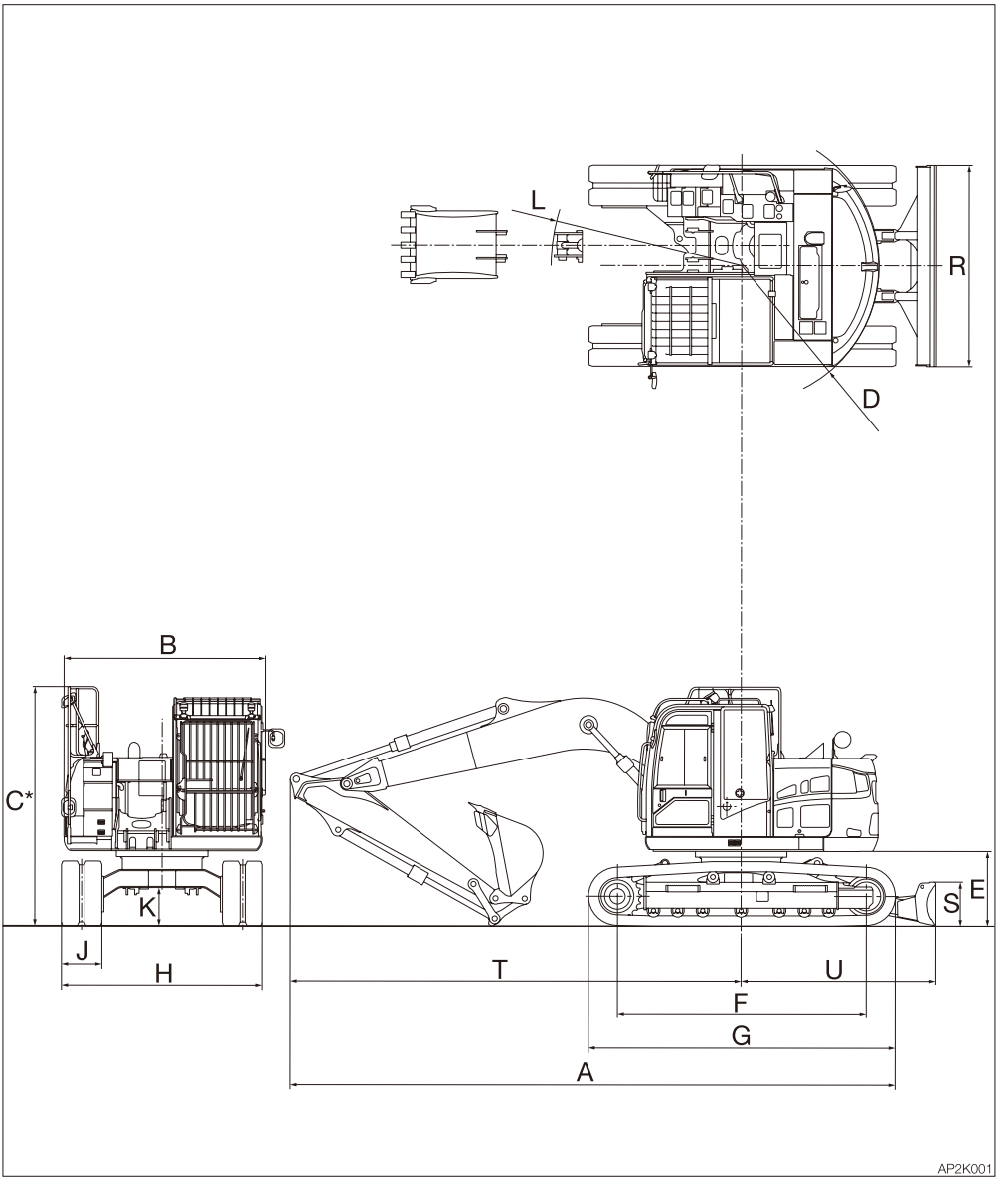
Unit:dB (A)

NOISE EMISSION		
DECLARED SINGLE-NUMBER NOISE EMISSION VALUES in accordance with ISO 4871*		
Sound power level (2000/14/EC)	Guaranteed sound power level	98
Emission sound pressure level at the operator's position**	Emission sound pressure level	75
Measured values and Uncertainties		
Sound power level (2000/14/EC)	Measured sound power level	97
	uncertainty	1
Emission sound pressure level at the operator's position**	Measured emission sound pressure level	73
	uncertainty	2

*: Declared single-number noise emission values are the sum of measured values and the associated uncertainty.
**: Values determined according to noise test code given in ISO 6396.

MACHINE DIMENSIONS

Mono boom

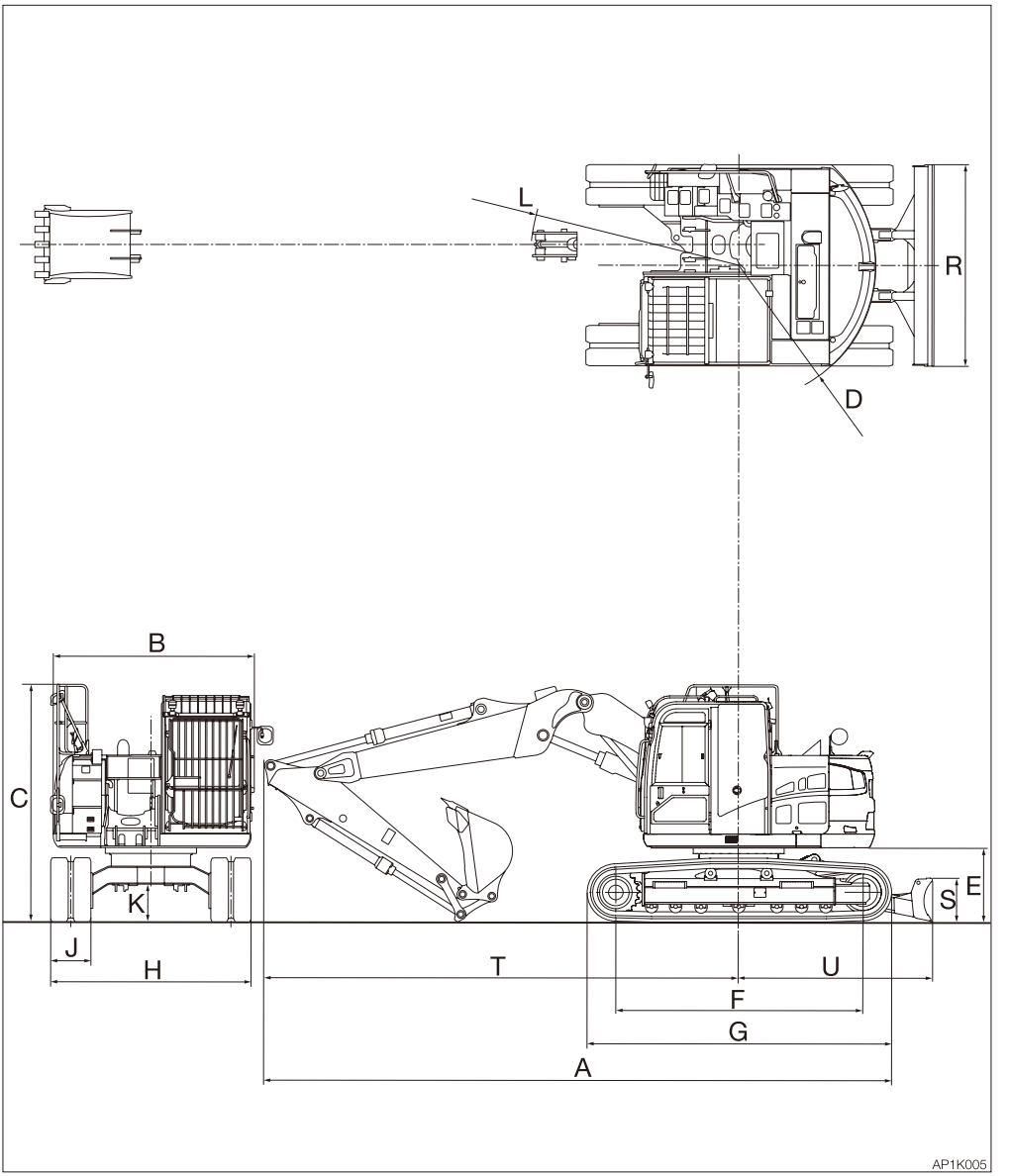


Unit: mm (inch)

	Item	Middle arm		Long arm	
		Rubber crawlers	Steel crawlers	Rubber crawlers	Steel crawlers
A	Overall length	7490 (294.9)	7470 (294.1)	7445 (293.1)	7405 (291.5)
B	Upperstructure overall width	2500 (98.4)	←	←	←
C*	Overall height	2960 (116.5)	2950 (116.1)	3190 (125.6)	←
D	Slew radius	1700 (66.9)	←	←	←
E	Clearance height under upperstructure	930 (36.6)	900 (35.4)	930 (36.6)	900 (35.4)
F	Crawler base	3080 (121.3)	3045 (119.9)	3080 (121.3)	3045 (119.9)
G	Crawler overall length	3795 (149.4)	3750 (147.6)	3795 (149.4)	3750 (147.6)
H	Crawler overall width	2490 (98)	←	←	←
J	Crawler shoe width	500 (19.7)	←	←	←
K	Ground clearance of undercarriage	475 (18.7)	445 (17.5)	475 (18.7)	445 (17.5)
L	Minimum radius of equipment and attachment	2360 (92.9)	←	2610 (102.8)	←
R	Dozer blade width	2490 (98)	←	←	←
S	Dozer blade height	550 (21.7)	←	←	←
T	Front distance to axis of rotation	5580 (219.7)	←	5535 (217.9)	←
U	Dozer blade distance to axis of rotation	2395 (94.3)	←	←	←

C*: For the long arm machine, the boom height is higher than the handrail.

2-Piece boom

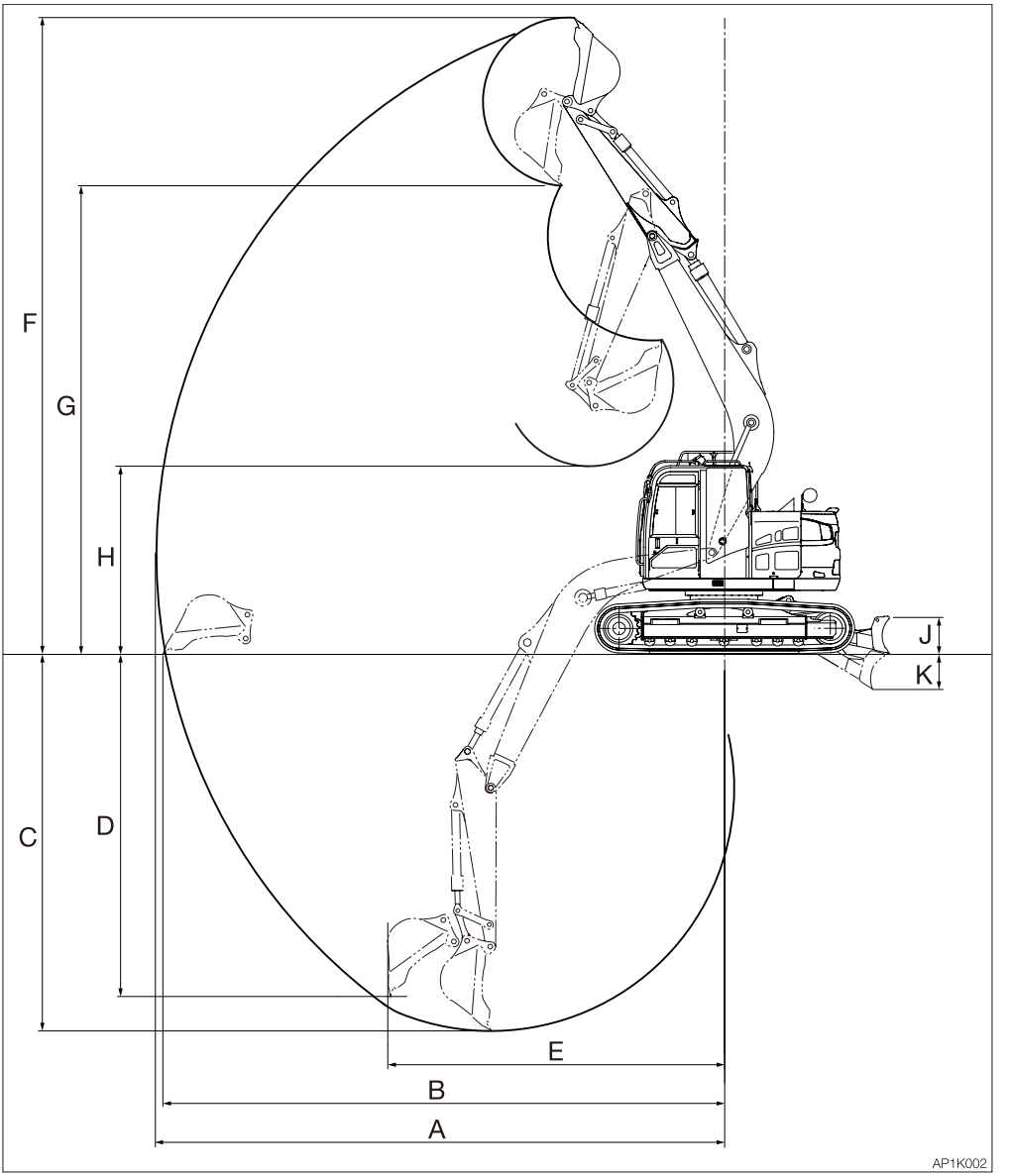


Unit: mm (inch)

	Item	Middle arm	
		Rubber crawlers	Steel crawlers
A	Overall length	7785 (306.5)	←
B	Upperstructure overall width	2500 (98.4)	←
C	Overall height	2960 (116.5)	2950 (116.1)
D	Slew radius	1700 (66.9)	←
E	Clearance height under upperstructure	930 (36.6)	900 (35.4)
F	Crawler base	3080 (121.3)	3045 (119.9)
G	Crawler overall length	3795 (149.4)	3750 (147.6)
H	Crawler overall width	2490 (98)	←
J	Crawler shoe width	500 (19.7)	←
K	Ground clearance of undercarriage	475 (18.7)	445 (17.5)
L	Minimum radius of equipment and attachment	2590 (102)	←
R	Dozer blade width	2490 (98)	←
S	Dozer blade height	550 (21.7)	←
T	Front distance to axis of rotation	5880 (231.5)	←
U	Dozer blade distance to axis of rotation	2395 (94.3)	←

OPERATING RANGES

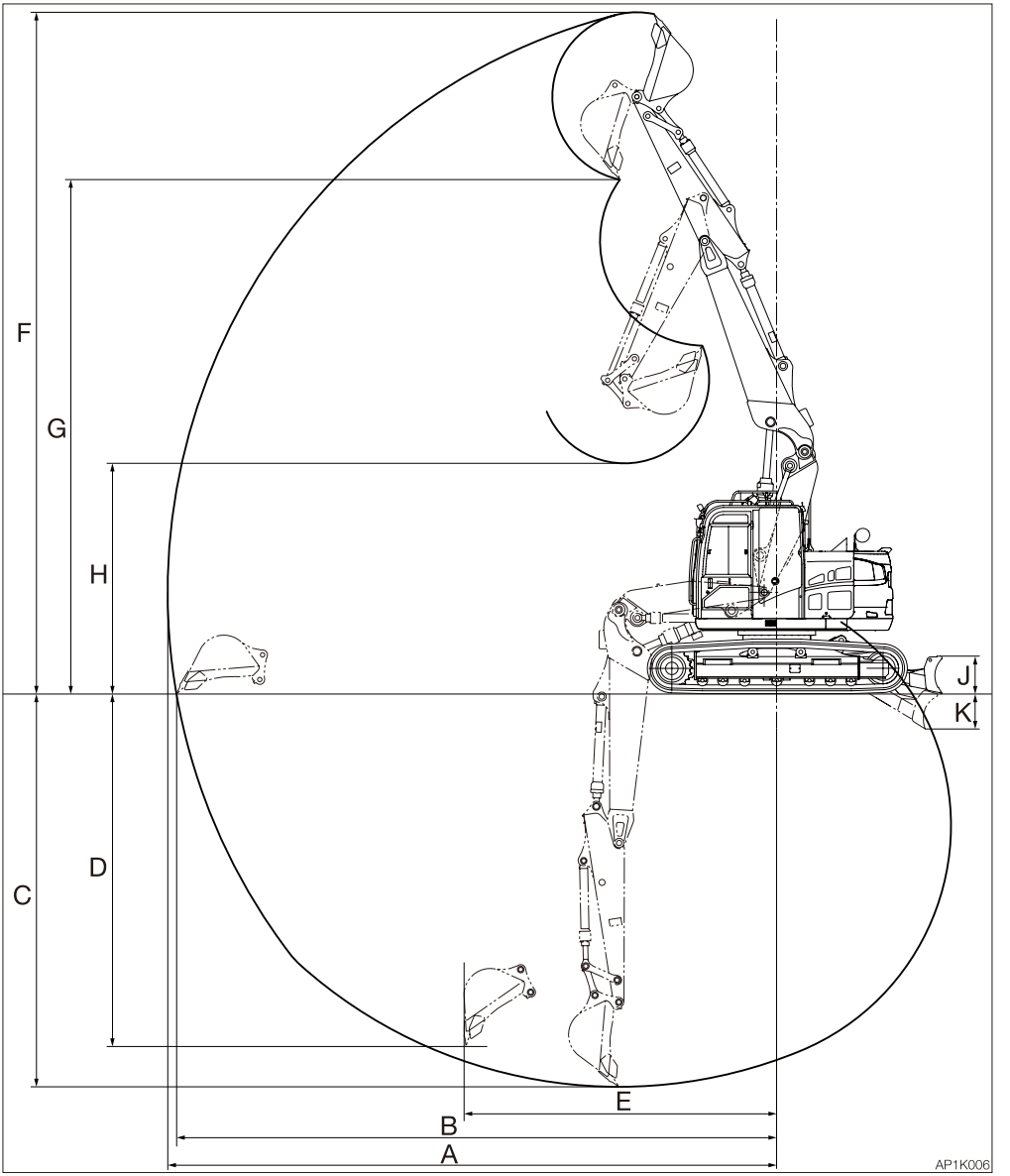
Mono boom



Unit: mm (inch)

	Item	Middle arm		Long arm	
		Rubber crawlers	Steel crawlers	Rubber crawlers	Steel crawlers
A	Maximum reach	8330 (328)	←	8790 (346.1)	←
B	Maximum reach at ground reference plane	8195 (322.6)	←	8665 (341.1)	←
C	Maximum digging depth	5500 (216.5)	5530 (217.7)	6030 (237.4)	6060 (238.6)
D	Maximum vertical digging depth	4995 (196.7)	5025 (197.8)	5515 (217.1)	5545 (218.3)
E	Reach at maximum vertical digging depth	4915 (193.5)	←	5025 (197.8)	←
F	Maximum height of cutting edge	9300 (366.1)	9270 (365)	9630 (379.1)	9600 (378)
G	Maximum dumping height	6845 (269.5)	6815 (268.3)	7170 (282.3)	7140 (281.1)
H	Minimum dumping height	2750 (108.3)	2720 (107.1)	2280 (89.8)	2250 (88.6)
J	Dozer blade maximum lifting	540 (21.3)	510 (20.1)	540 (21.3)	510 (20.1)
K	Dozer blade maximum lowering	515 (20.3)	545 (21.5)	515 (20.3)	545 (21.5)

2-Piece boom



Unit: mm (inch)

	Item	Middle arm	
		Rubber crawlers	Steel crawlers
A	Maximum reach	8860 (348.8)	←
B	Maximum reach at ground reference plane	8730 (343.7)	←
C	Maximum digging depth	5720 (225.2)	5750 (226.4)
D	Maximum vertical digging depth	5130 (202)	5160 (203.1)
E	Reach at maximum vertical digging depth	4545 (178.9)	←
F	Maximum height of cutting edge	9925 (390.7)	9895 (389.6)
G	Maximum dumping height	7490 (294.9)	7460 (293.7)
H	Minimum dumping height	3360 (132.3)	3330 (131.1)
J	Dozer blade maximum lifting	540 (21.3)	510 (20.1)
K	Dozer blade maximum lowering	515 (20.3)	545 (21.5)

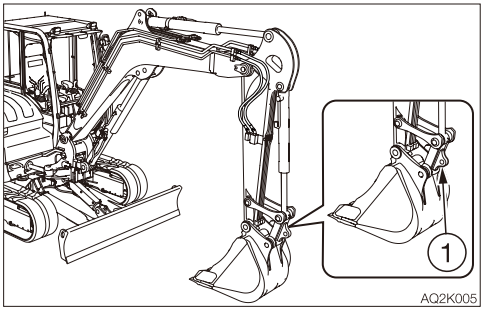
LIFTING CAPACITIES

When an excavator is used to lift loads in Europe, it must comply with EN 474-1: 2022.
Install the following devices, and then turn on the overload warning switch before starting the lifting operation:
- Lifting device
- Lifting safety device

The lifting safety device must include the emergency shut-off valves on the boom and on the arm.
For a 2-piece boom machine, an emergency shut-off valve must be installed on the first boom, the second boom and the arm, respectively.
If the blade is used as an outrigger when lifting loads, the blade cylinder must be equipped with an emergency shut-off valve.
Refer to “Lifting safety device” on page 2-108.

Rated lift capacity chart
- The loads in the charts do not exceed 87% of hydraulic lift capacity or 75% of tipping load.
- Figures marked with an asterisk (*, ※) are hydraulically-limited capacities.
- The bucket mass is excluded.
- The mass of slings and any other lifting devices shall be deducted from the rated load to determine the net load that may be lifted.
- The load point is the bucket hinge pin.
- The bucket cylinder is fully extended.
- Unit: kg (lbs)

Lifting device (If equipped)



IMPORTANT: When a lifting operation is performed using a machine in Europe, you must use a machine equipped with a lifting device that complies with EN 474-1: 2022. Use a Takeuchi genuine lifting device (1).
If your machine is not equipped with our genuine lifting device (1), you must install an attachment that has a lifting device complying with EN 474-1: 2022.
When such an attachment is required, contact a Takeuchi sales or service dealer for advice.

When lifting loads, install the sling on the lifting device (1).

Load hooking system
A load hooking system must be provided with the following capabilities.
1. A system which can withstand two-and-a-half times the rated lift capacity no matter at what position the load is applied.
2. A system that poses no risk of the lifted load falling from the hooking device. For example, equipped with a hook slippage prevention device.
3. A system that poses no risk of the hooking system slipping from the hoe attachment.

Inspection before lifting loads

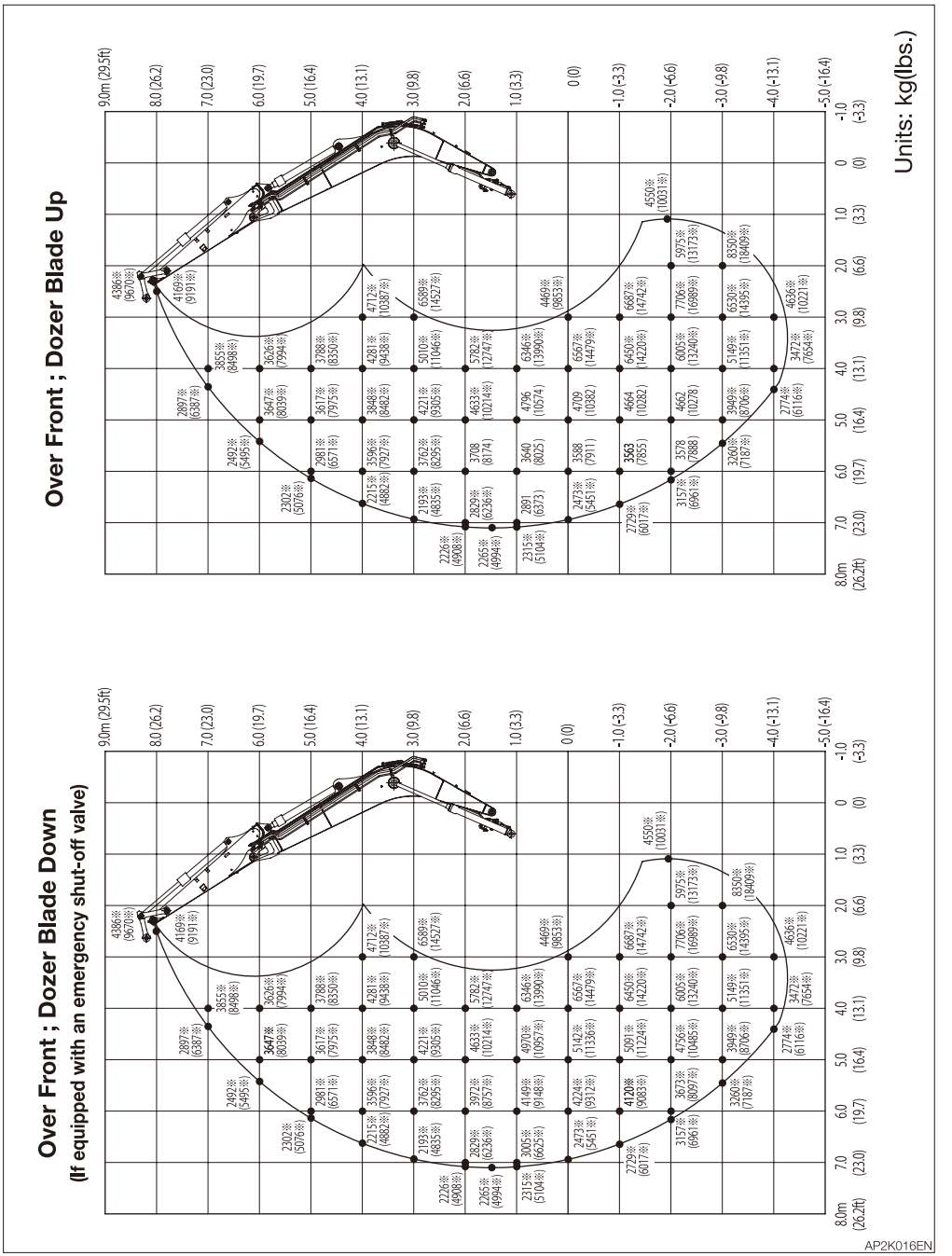
Before lifting loads, inspect the following items to ensure there is no abnormality:

- Inspect for any damage to the attachment, hose or lifting device.
- Confirm that the overload warning device operates.
  Turn on the overload warning switch, and then fully raise the boom. If the horn is sounded, the overload warning device is normal.

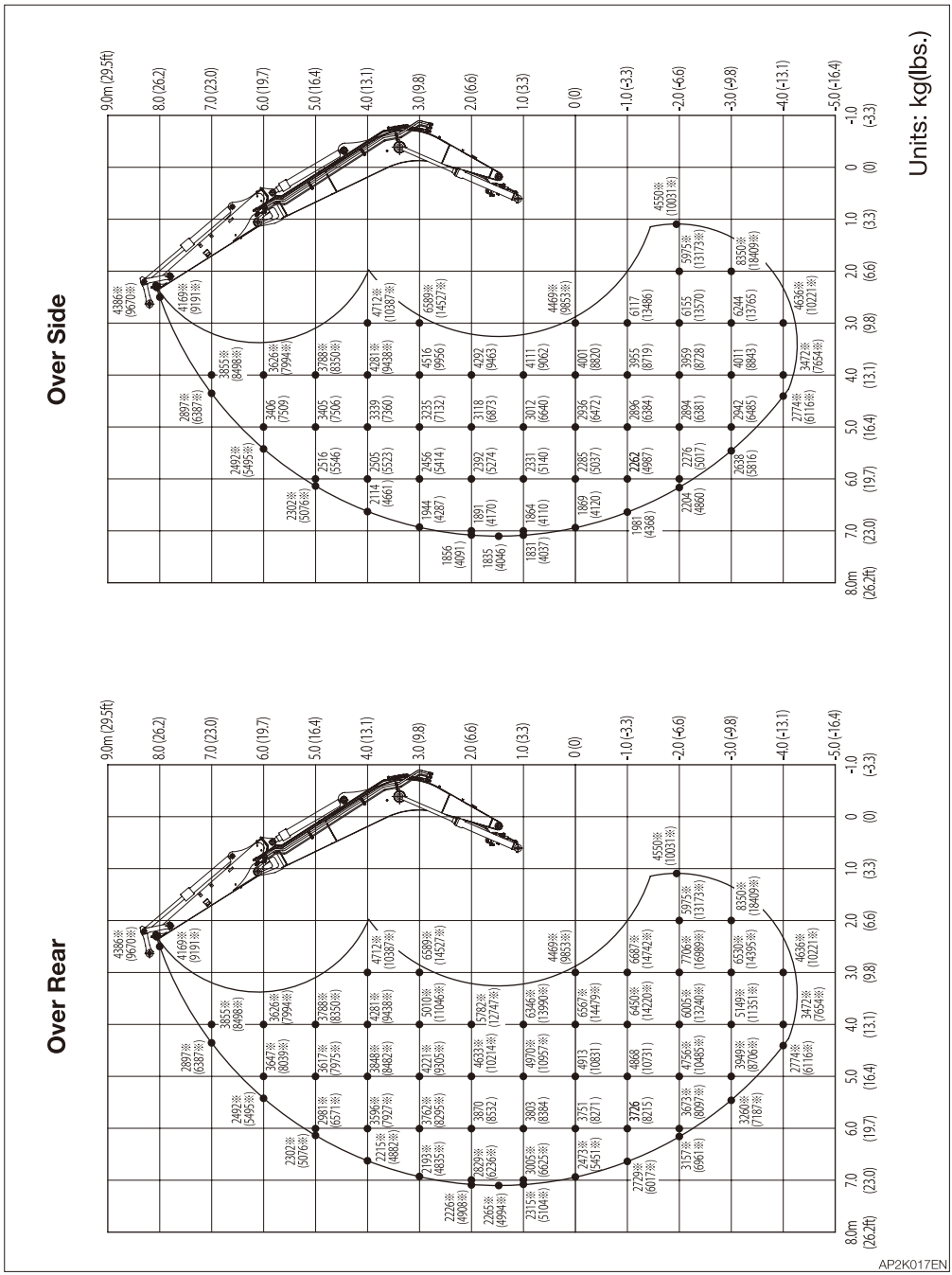
⚠ WARNING

- **Do not attempt to lift or hold any load that is greater than these rated values at their specified load radii and height.**
- **The rated lift capacities are based on the machine being level and situated on a firm supporting surface. For safe lifting, the operator is expected to make due allowance for the particular job conditions such as soft or uneven ground, non-level condition, load to the machine sides, hazardous conditions, experience of personnel, etc. The operator and other personnel should fully acquaint themselves with the operator's manual furnished by the manufacturer before operating this machine. When operating the machine, the safety rules of the equipment must also be followed.**
- **Do not travel while lifting a load; It is very dangerous.**

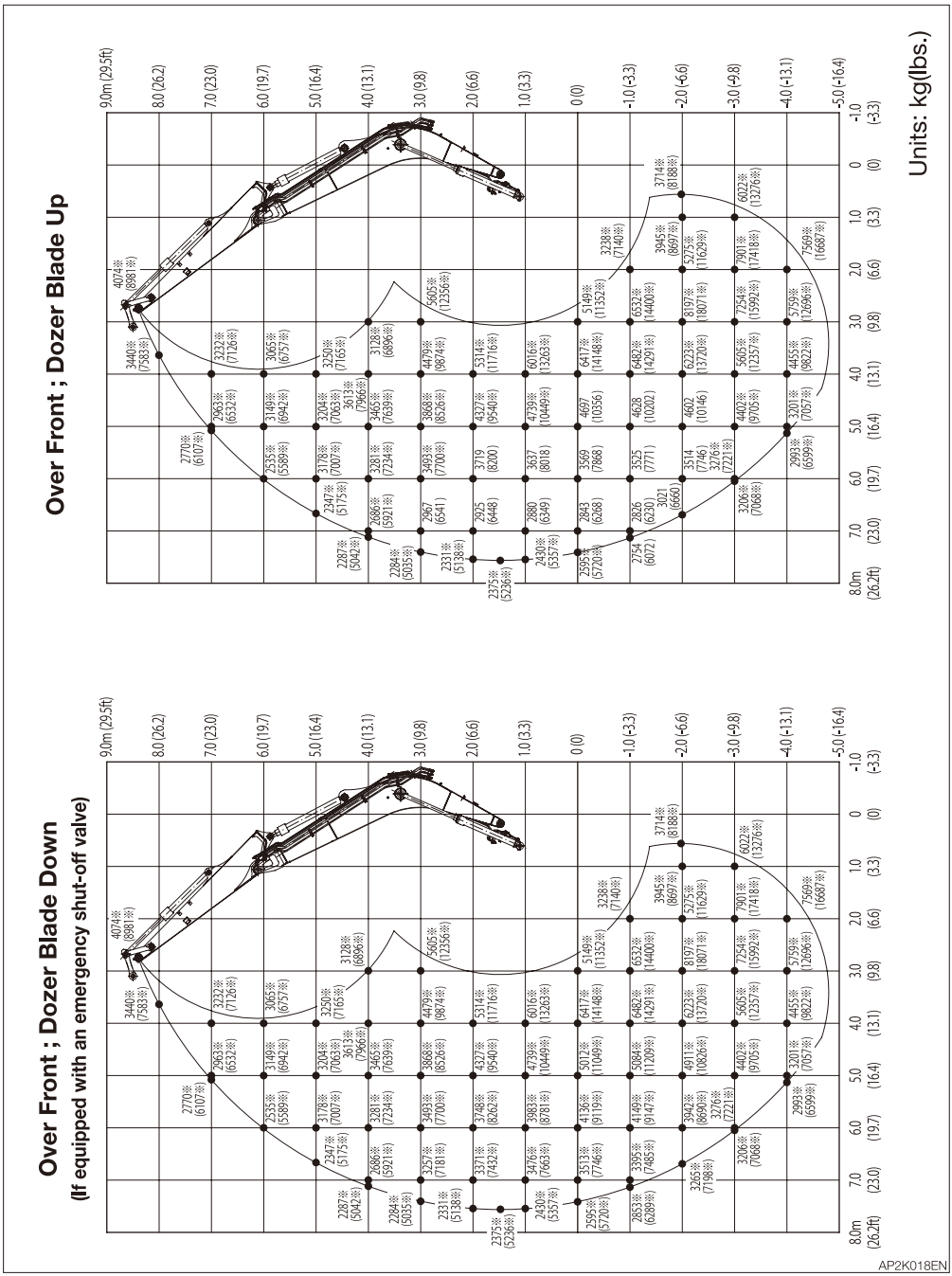
Mono-boom with dozer blade (middle arm)



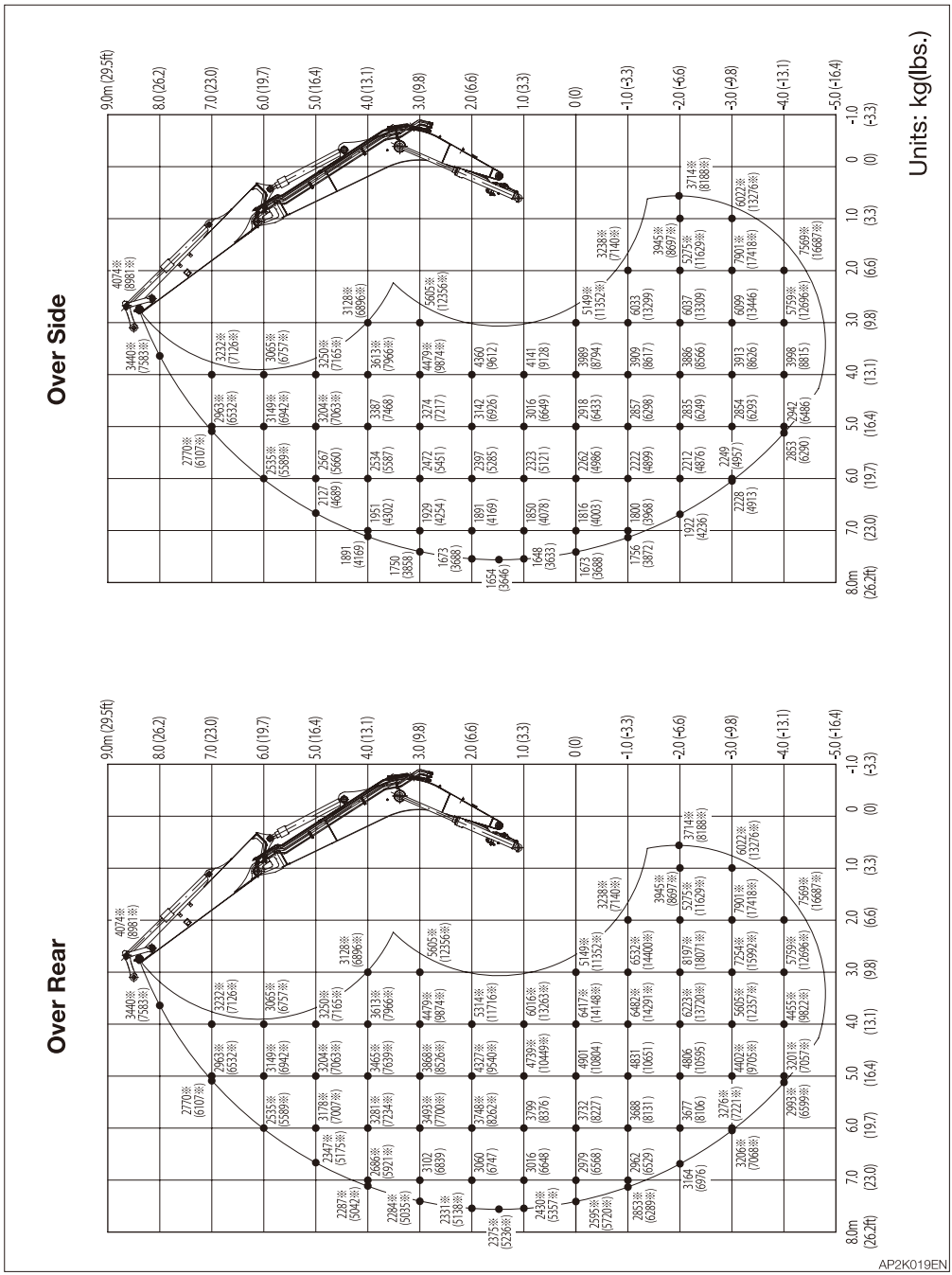
Mono-boom with dozer blade (middle arm)



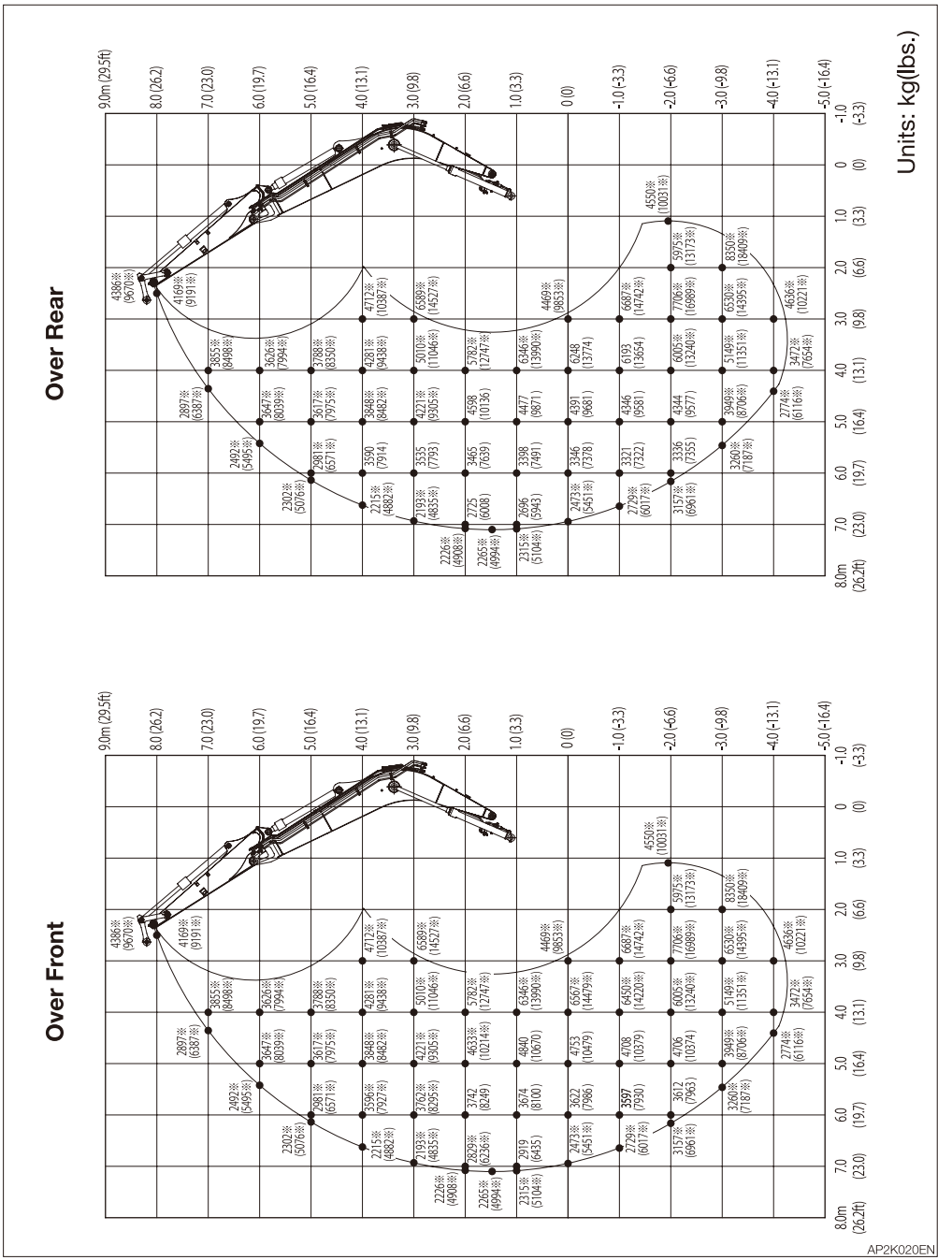
Mono-boom with dozer blade (long arm)



Mono-boom with dozer blade (long arm)

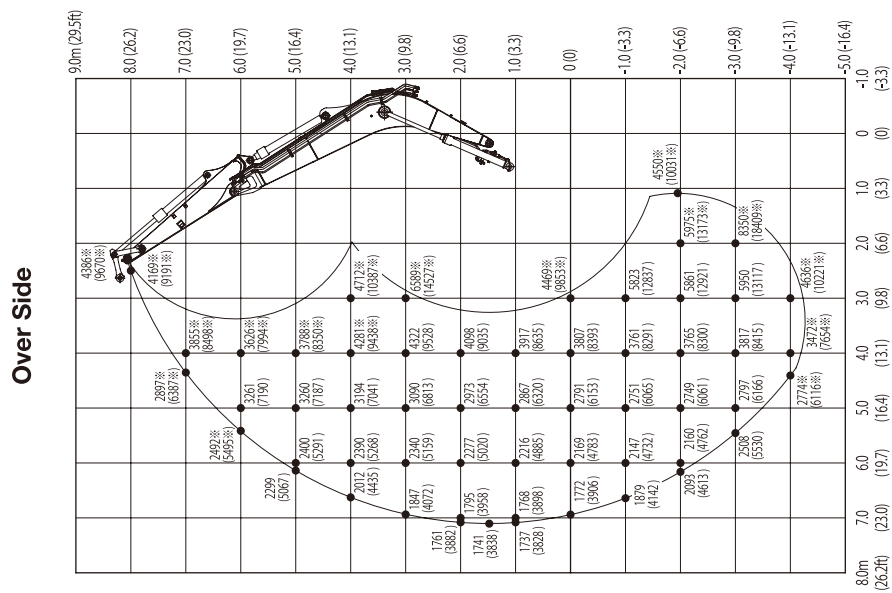


Mono-boom without dozer blade (middle arm)



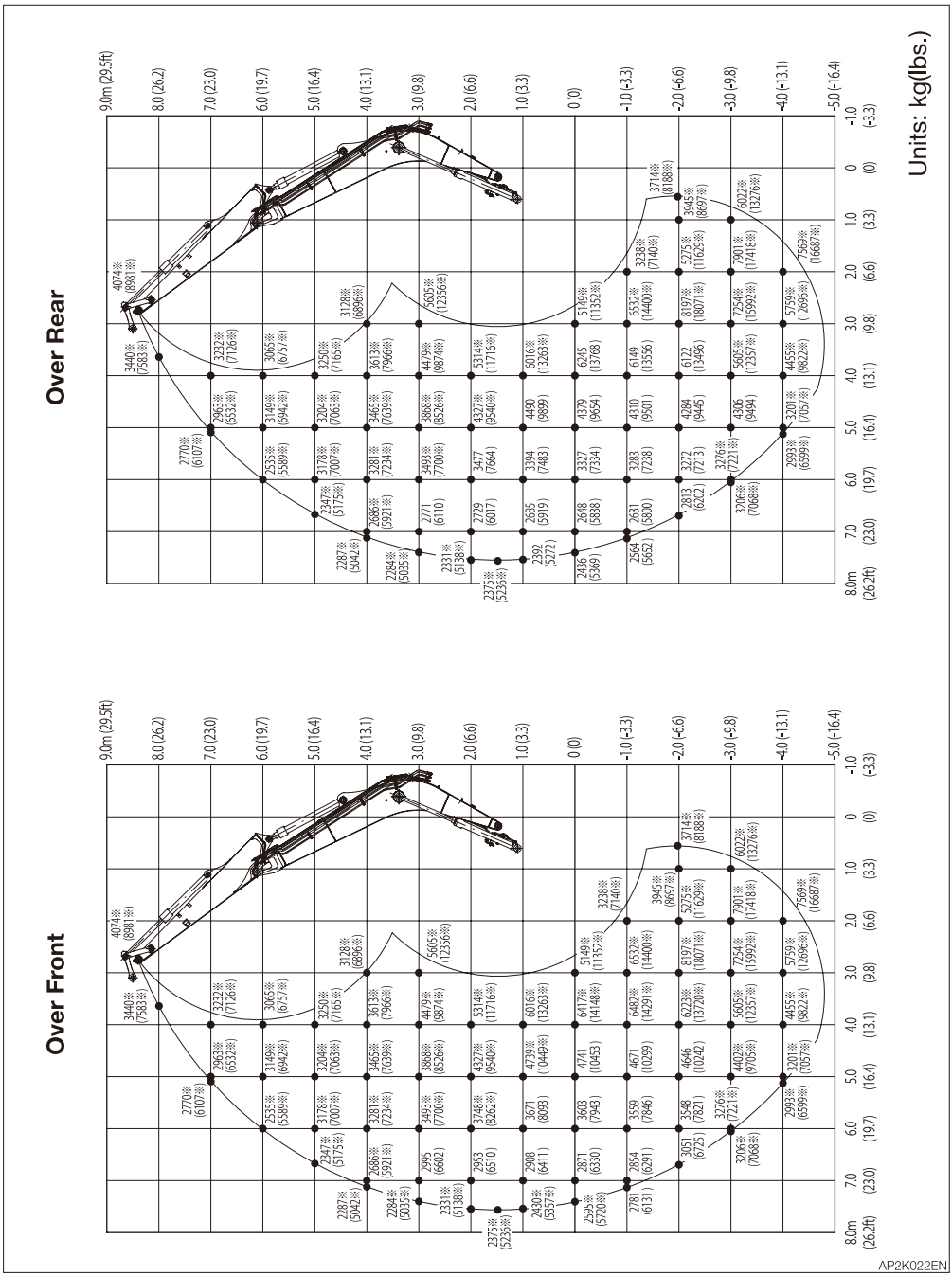
Mono-boom without dozer blade (middle arm)

Units: kg(lbs.)



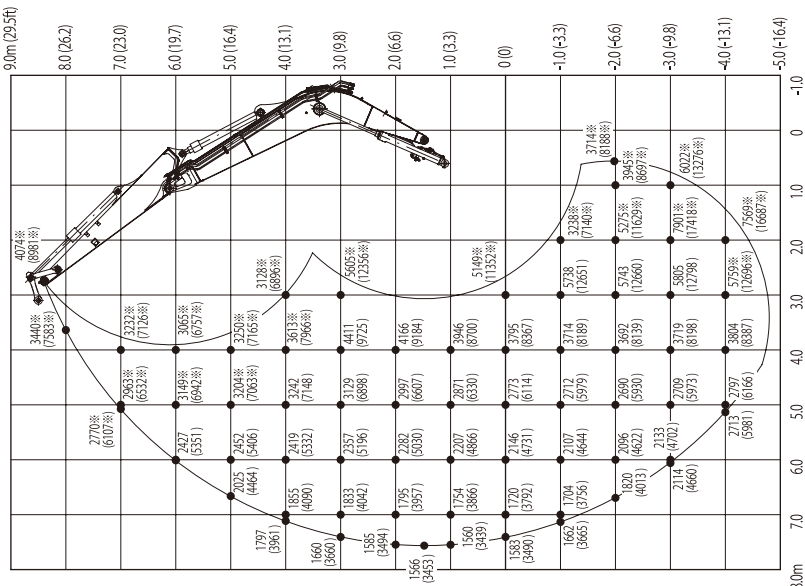
AP2K021EN

Mono-boom without dozer blade (long arm)



Mono-boom without dozer blade (long arm)

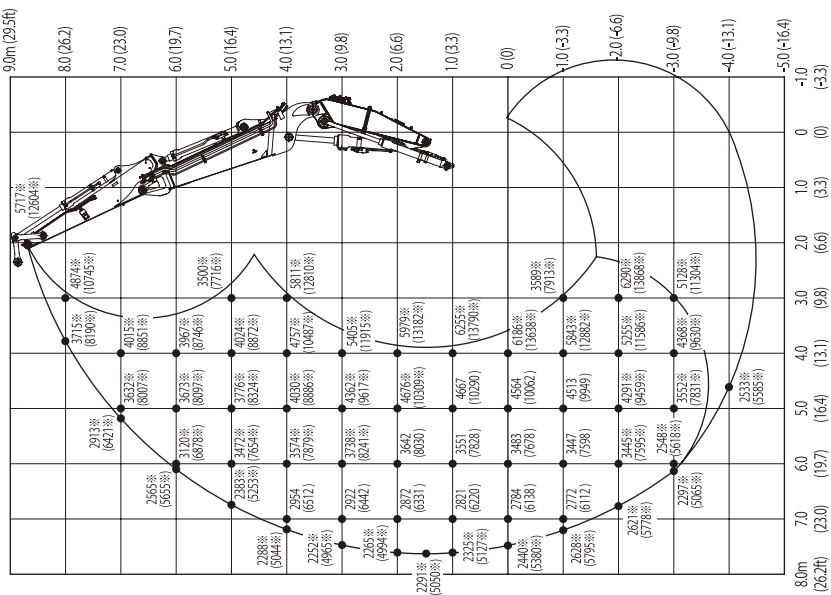
Units: kg(lbs.)



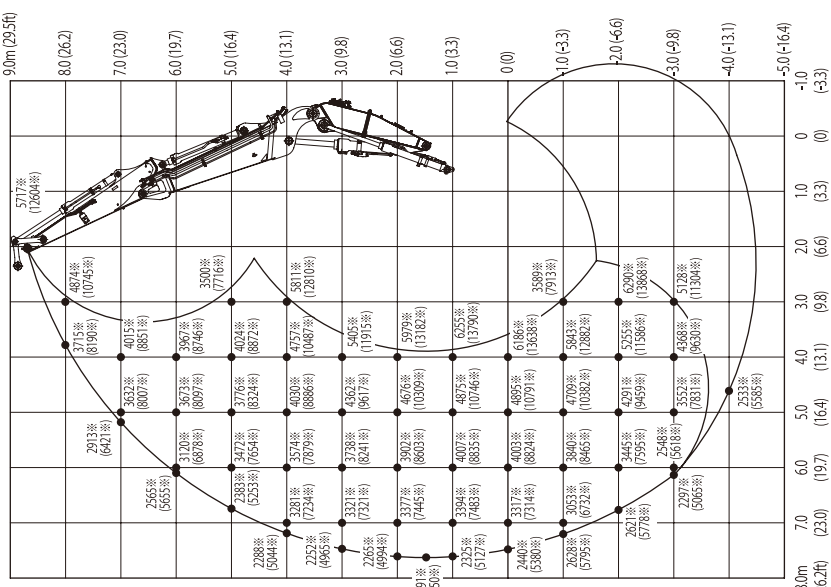
AP2K023EN

2-Piece boom

Over Front ; Dozer Blade Up



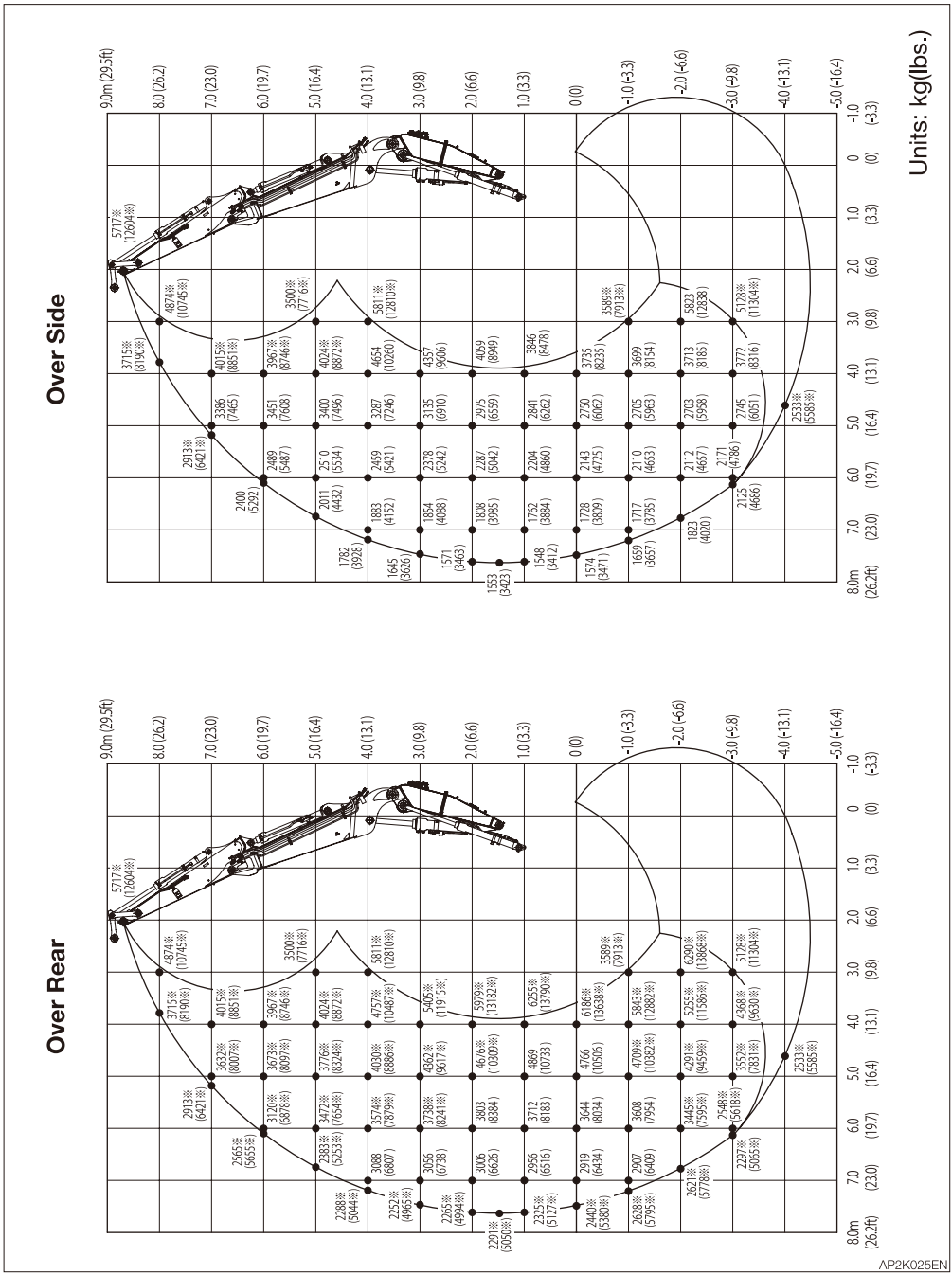
Over Front ; Dozer Blade Down
(If equipped with an emergency shut-off valve)



Units: kg(lbs.)

AP2K024EN

2-Piece boom



OPTIONS

GENERAL PRECAUTIONS

SAFETY PRECAUTIONS

⚠ WARNING

When removing or installing an attachment or optional part, take the following precautions.

- **Consult with Takeuchi before installing an optional attachment.**
- **Do not use any attachments not approved by Takeuchi. Doing so may cause safety problems. Or, it may adversely affect the machine's operation or service life.**
- **We will not be held responsible for any injuries, accidents or damage to its products caused by the use by a non-approved attachment.**
- **Select a firm, level work area. Also, be sure to park in a well ventilated place.**
- **Clear obstacles and dangerous objects, and clean up spilled fuel immediately.**
- **When lifting, be sure to designate a person to act as a signalman. Follow the instructions of the signalman regarding the procedure and measures.**
- **When it is necessary to temporally place a heavy object or an attachment on the ground during removal or installation, be sure to place it in a stable position.**
- **Keep everyone out of the area when lifting. There is a hazard of objects falling or contacting with people in the area.**
- **Use a crane to move heavy objects (25 kg (55 lb.) or greater).**
- **Before removing a heavy object, be sure to put a support to it. When lifting with a crane, pay attention to the center of gravity of the load to keep the machine in balance.**
- **Do not operate the machine while the load is lifted by a crane stand.**
- **Use the proper procedure when mounting a boom or arm; otherwise serious damage could result. Consult your sales or service dealer for help.**

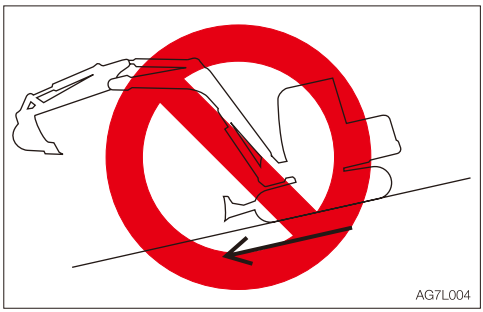
CAUTIONS WHEN INSTALLING ATTACHMENTS

Be sure to perform a test operation after an optional or other special attachment has been replaced. Inspect the hydraulic oil level and recharge it as necessary. Consult your sales or service dealer for detailed procedures on installing/removing attachments.

CAUTIONS WHEN OPERATING ATTACHMENTS

⚠ WARNING

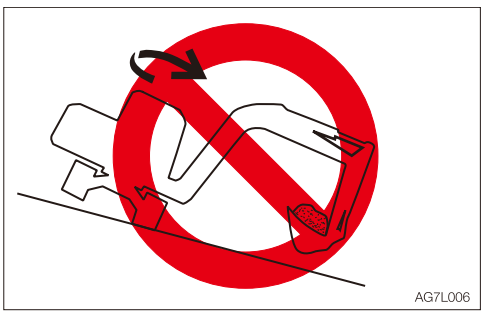
Long attachments reduce stability of the machine. The machine may tip over if it loses the balance when traveling or slewing on slopes.
Never perform the operations listed below as they are extremely dangerous.



- Traveling down the slopes with the attachment raised



- Traveling across slopes



- Slewing on slopes
- If there is a heavy attachment is installed, the machine takes longer distance than usual to come to a complete stop when the stopping operation is performed. Carefully judge the distance so as not to bump into an object around the machine. Keep a safe distance from surrounding obstacles. When a heavy attachment is installed, natural drop (the gradual dropping of the attachment under its own weight when it is stopped in midair) increases.
- The machine can tip over more easily in the lateral direction than in the longitudinal direction.
  - Do not slew sideways with a heavy load at the how attachment. In particular, do not slew sideways on slopes.
  - The attachment is heavier for machines equipped with breakers or crushers than for machines equipped with the standard bucket. Do not operate such machines sideways, especially digging downhill.
- When a long arm is installed, the operating range increases. Carefully judge the distance so as not to bump into an object around the machine. Keep a safe distance from surrounding obstacles.

ATTACHMENT COMBINATION TABLE

The table below shows which bucket should be installed when the machine is using a standard arm, middle arm or long arm. Select a proper bucket by following the table.

⚠ WARNING

- **Consult with Takeuchi before installing an optional attachment.**
- **Do not use any attachments not approved by Takeuchi. Doing so may cause safety problems. Or, it may adversely affect the machine's operation or service life.**
- **We will not be held responsible for any injuries, accidents or damage to its products caused by the use by a non-approved attachment.**

√: Can be used.
Δ: Can be used only for light operations (digging and loading of dry and loose soil or mud)
—: Cannot be used.
Total bucket mass = Bucket mass + Heaped bucket load (specific gravity: 1.8)

Bucket	Rated capacity m^3 (cu.yd.)	Bucket cutting width mm (inch)	Middle arm 2320 mm (91.3 in.)	Long arm 2850 mm (112.2 in.)
970 W (S.T.D.)	0.45 (0.54)	970 (38.2)	√	√
Total bucket mass = Within 1190 kg (2620 lb.)		Within 970 (38.2)	√	√

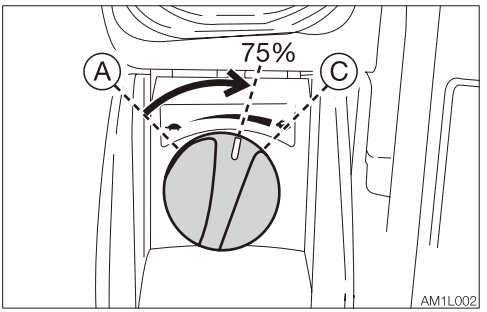
MEMO

HYDRAULIC BREAKER

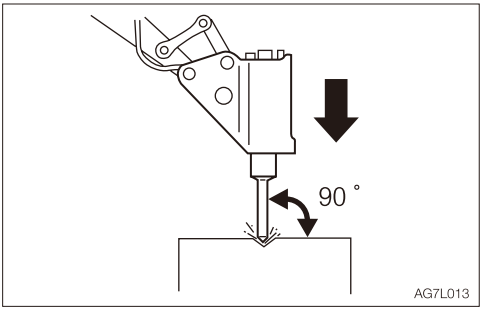
For handling of the breaker, read the hydraulic breaker's manual, provided separately.

IMPORTANT: When installing an attachment, make sure that it is appropriate for the machine being used. Contact your sales or service dealer for advice on selecting attachments.

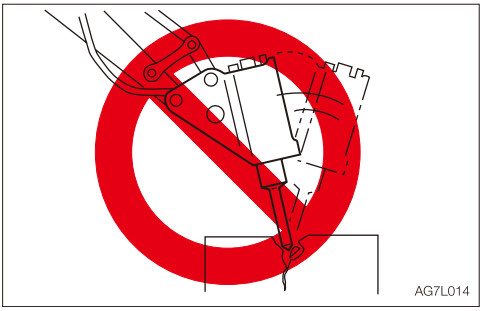
CAUTIONS ON OPERATING



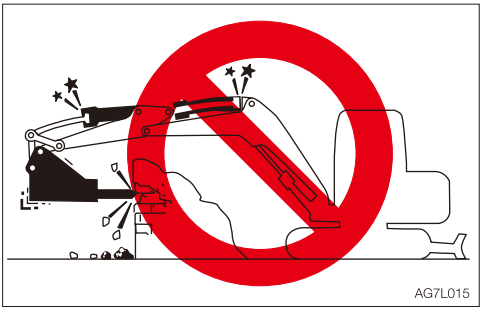
- Start the engine and run it at 75% of the maximum speed.



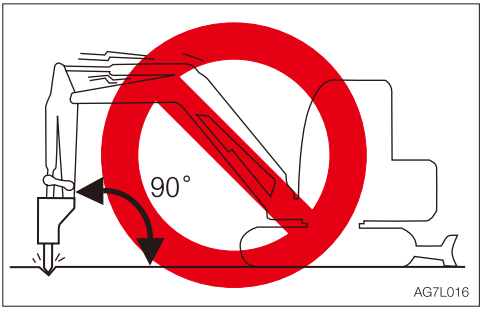
- Pound with the chisel pressed perpendicular to the surface to be pounded.
- When pounding, press the chisel properly against the object to be broken so as to avoid pounding the air.



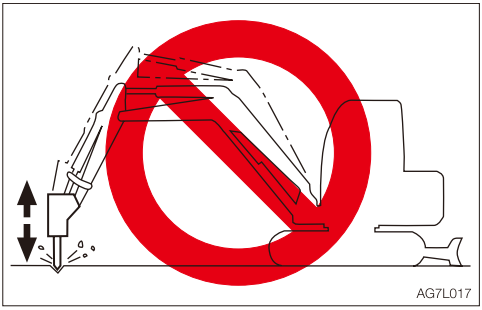
- Do not pry with the chisel or do not pry while pounding.
- Do not move the chisel while pounding.
- Do not pound continuously for over 30 seconds on the same surface.



- Do not pound with the cylinder fully extended or retracted (at the stroke end). Leave a margin of at least 50mm (2 in).



- Do not pound with the arm placed perpendicular to the ground surface.



- Do not drop the breaker itself on the object to be broken in order to break it.
- Do not move objects to be broken or rocks with the breaker itself.
- Slew the machine occasionally to cool the engine.
- If a hydraulic hose is vibrating abnormally, nitrogen gas may be leaking from the accumulator. Ask for an inspection early.

REPLACING THE HYDRAULIC OIL REGULARLY

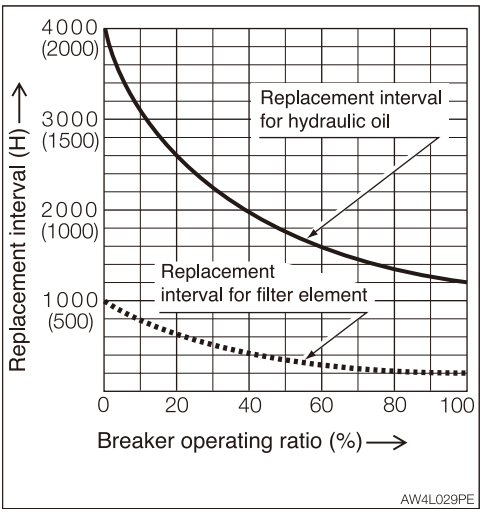
When a hydraulic breaker is used, the oil deteriorates more quickly than that used for a usual operation. Be sure to replace the hydraulic oil and the return filter elements.

- Failure to replace these in time can lead to damage to the machine and the breaker hydraulic system. To improve the service life of the hydraulic systems, be sure to replace the hydraulic oil and return filter element after the number of hours shown on the diagram below.
- When replacing the hydraulic oil, clean the suction strainer.

Replacement interval (hours)

Item	Hydraulic oil	Filter element
1st time	—	25
2nd time	—	100
Periodically	1200 (600)	200

When the breaker operating ratio is 100%.



( ): When using conventional antiwear hydraulic oil.

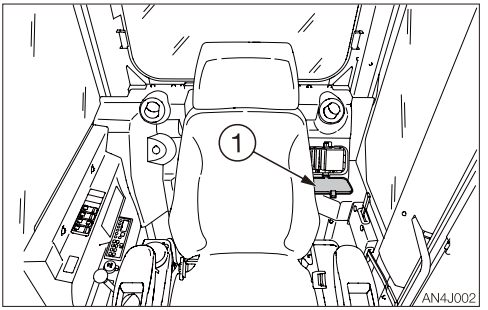
TRAVEL ALARM

The alarm sounds while the machine is traveling and stops when the machine stops traveling.
If the alarm does not sound when the machine travels, the fuse may be blown. Inspect the fuses.

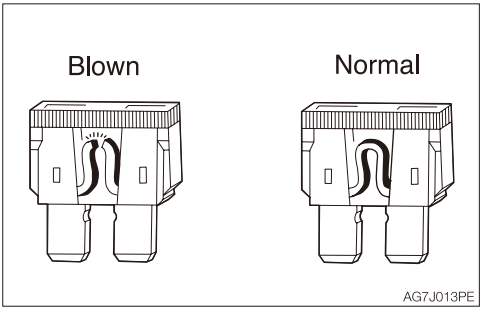
⚠ WARNING

If the fuse blows again soon after replacement, then the electric system is likely faulty. It may pose a fire hazard if not properly repaired. Contact your sales or service dealer for advice.

1. Turn the starter key to the OFF position to stop the engine.

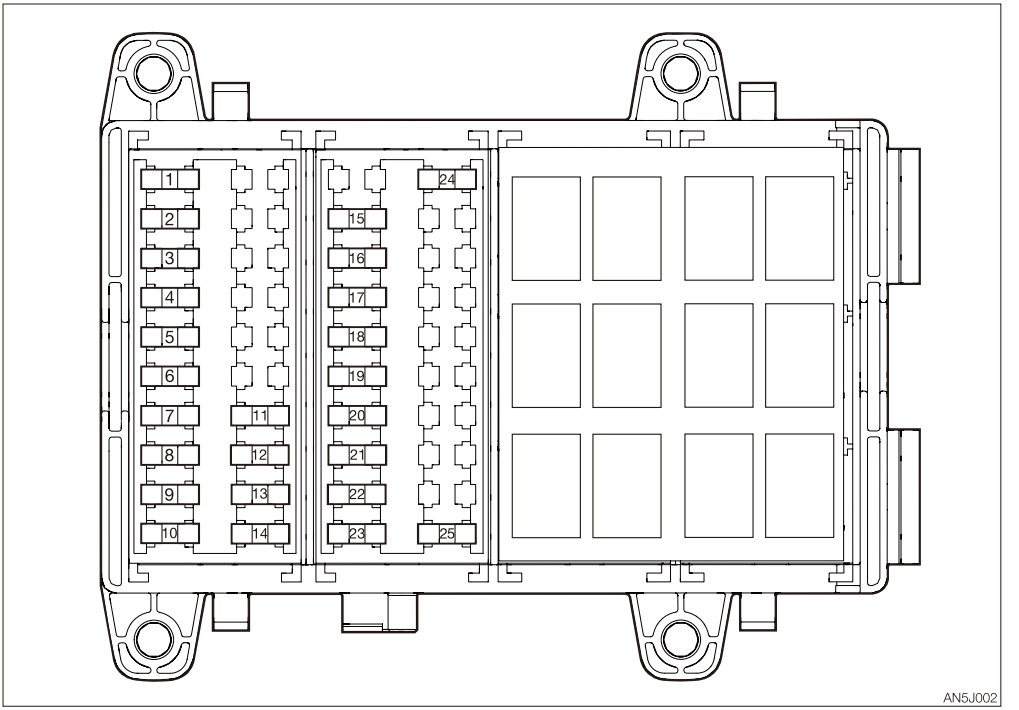


2. Loosen the screw and open the fuse box cover (1).
3. Check for any blown fuses (2).



4. If a fuse is blown, replace it with a spare fuse of the same capacity.

Fuse layout and circuits protected



No.	Capacity	Symbol	Protected circuit	Fuse No.
1	25A		Fan switch	F1
2	10A		Air conditioner switch	F2
3	15A	OPT (2)	Option (2)	F3
4	15A	OPT (1)	Option (1)	F4
5	25A	CAB	Cab	F5
6	10A		Display	F6
7	10A		Controller, **travel alarm**	F7
8	20A		Safety lock lever	F8
9	10A		Wiper	F9
10	20A		Lights	F10
11	5A	OPT (12V)	Option (12V)	F11
12	15A		NOx sensor	F12

No.	Capacity	Symbol	Protected circuit	Fuse No.
13	5A		DEF sensor	F12
14	3A		Anti-theft	F11
15	15A		Controller	F29
16	10A		Display	F28
17	3A		Anti-theft	F27
18	25A		Fuel supply pump	F26
19	30A		ECU	F25
20	20A 10A**		Feed pump	F24
21	30A		SCR system	F23
22	10A		Starter switch	F22
23	10A		Horn	F21
24	10A	OPT (12V)	Option (12V)	F40
25*	5A		Pre heater	F31

*: Applicable machine models 514800713 or later
**: Applicable machine models 514800743 or later
Applicable machine models 514901503 to 514901512, 514901514 or later

OPTIONAL EQUIPMENT MASS

OPTION	
Steel crawlers of 500-mm width (including shoe guide)	100 (220)
Segment rubber (including shoe guide)	185 (410)
Steel crawlers of 700-mm width (including shoe guide, steps and blade)	650 (1435)
Steel crawlers of 600-mm width (including shoe guide, steps and blade)	315 (695)
Blade for 700-mm width	30 (66)
Center guide	25 (55)
Float	15 (33)
Emergency shut-off valve (Arm)	10 (22)
Auxiliary 3rd + Auxiliary 4th.	45 (99)
Auxiliary 3rd	20 (44)
2-Piece boom (with adjust shut-off valve)	630 (1389)
No bucket	–380 (–838)
Front guard	55 (121)
No blade	–795 (–1753)
Long arm	70 (154)

Units: kg (lb)

*: Mass of optional equipment is added to the standard machine mass.
*: This table only contains the optional equipment of 10kg (20lb) or more in mass.

BIODEGRADABLE OIL

Biodegradable oil is a new type of hydraulic oil that is decomposed into carbon dioxide and water by microorganisms in the soil and water. It is highly safe for living organisms and offers advantages in term of environmental protection.

- Recommended biodegradable oil: Mobile EAL Envirosyn 46H (an ester synthetic oil) and Panolin HLP Synth 46 (an ester synthetic oil).
  When replacing the mineral oil with biodegradable oil, use either of the above brand oil.
  Note that there are oils of other brands, even among ester synthetic oils, which may damage O-rings, packings and seals.
- When switching from a mineral oil to a biodegradable oil, the parking brake torque decreases by about 30%.

REPLACING THE HYDRAULIC OIL WITH BIODEGRADABLE OIL

- A mixture of mineral oil and biodegradable oil or a mixture of different brands of biodegradable oils will result in a decrease in performance of the hydraulic oil, biodegradability and safety. The inside of the hydraulic oil system must be flushed (cleaned) before replacing. The residual mineral oil in the machine should be about 2% or less, as complying with the ISO 15380.
- This operation is dangerous and requires experience. Ask a Takeuchi sales or service dealer for help.

Flushing

To be performed by a Takeuchi sales or service outlet

1. Drain the hydraulic oil (mineral oil) from the hydraulic oil tank and clean the inside of the tank and suction strainer.
   Refer to “Replacing the hydraulic oil and cleaning the suction strainer” on page 5-68.
2. Remove the cylinder hoses and drain the hydraulic oil (mineral oil) from inside the cylinders.
3. Supply new biodegradable oil to the hydraulic oil tank.
4. Bleed the air from the hydraulic oil system.
5. Operate the hydraulic devices for 30 minutes.
6. Drain the biodegradable oil from the tank and cylinders.
7. Replace the hydraulic oil return filter with a new filter.
8. Repeat steps 3 and 4.
9. Operate the hydraulic devices for 30 minutes.
10. Drain the biodegradable oil from the tank and cylinders.
11. Repeat steps 3 and 4.
12. Operate the hydraulic devices for 1 hour.
13. Drain the biodegradable oil from the tank and cylinders.
14. Replace the return filter with a new filter.
15. Repeat steps 3 and 4.
16. Operate the hydraulic devices, then check for oil leakage.

There is no need to flush the hydraulic oil system when switching from biodegradable to mineral hydraulic oil.

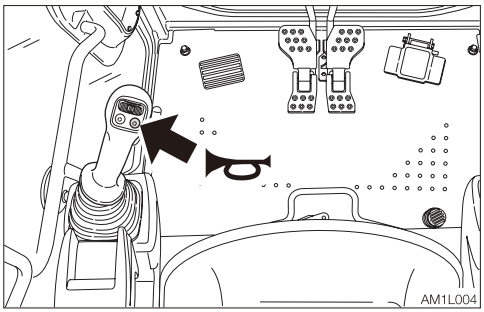
CAB OPTIONS



1. Front guard (Level II: ISO 10262)
2. Rear light

OPERATING LEVER SWITCH KIT 1

HORN BUTTON

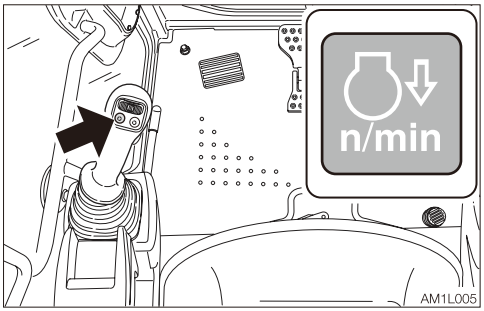


Press the button situated on the left operating lever to blow the horn.

DECELERATION BUTTON

⚠ WARNING

Before operating the deceleration button, set the operating lever to the neutral position and take your foot off the pedals. If the deceleration button is pressed while driving, the machine's operating speed will abruptly change to result in a dangerous situation.

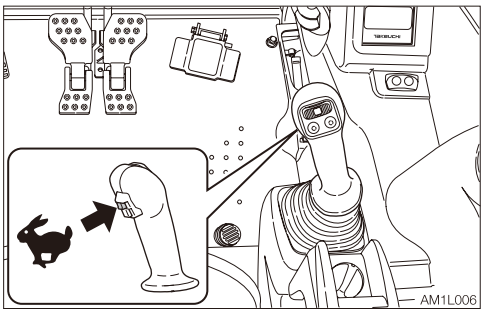


Press this button on the left operating lever to lower the engine speed to low idling. Press the button again to return to the engine speed set with the throttle controller. For safety reasons, it is designed that the deceleration function is activated to set the engine revolutions to low idling whenever the engine is started.
Cancel the deceleration mode by pressing the deceleration button as necessary.
Note: This deceleration button is capable of decreasing the engine speed and reducing the fuel consumption, with a simple operation, in a situation such as when little engine output is required and thus the operating or the travel levers are in neutral.

TRAVEL SPEED BUTTON

⚠ WARNING

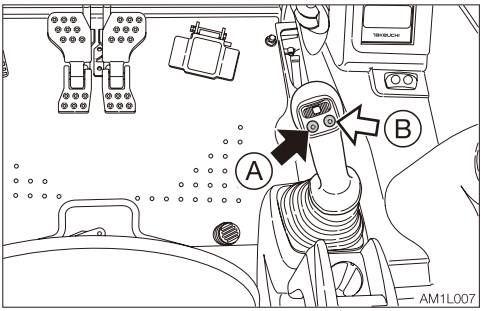
When a load greater than a set value is applied during traveling in 2nd (high) speed, the speed will automatically slow down to 1st (low) speed. When the load becomes lighter, the speed will increase and return to 2nd (high) speed. It should be noted that the travel speed changes depending on the load condition (for machines with the automatic travel shift-down system).



Press this switch to set the travel speed to 2nd (high) speed. Press it again to return to 1st (low) speed.

AUXILIARY 1ST SWITCHES

Auxiliary hydraulic buttons



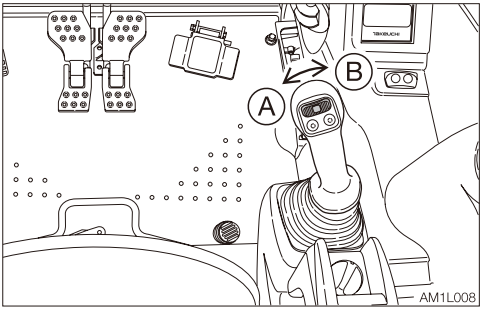
Press those buttons to control the flow of the oil in the first auxiliary hydraulic lines.

- Proportional control of the auxiliary hydraulic circuit is not possible.

(A).....Hydraulic oil flows to the left auxiliary line (a).
(B) .....Hydraulic oil flows to the right auxiliary line (b).

Slider switch (Proportional control)

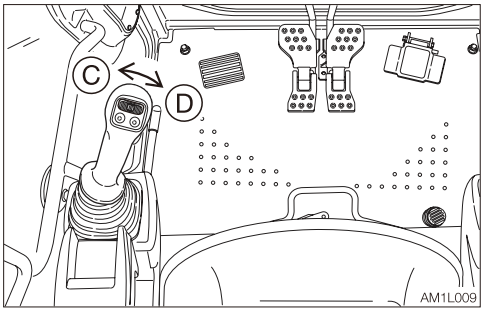
Proportional control allows for slow-to-fast/ fast-to-slow movement of attachment. Example: If you move the slider switch half way, the attachment will move at approximately one-half the speed.



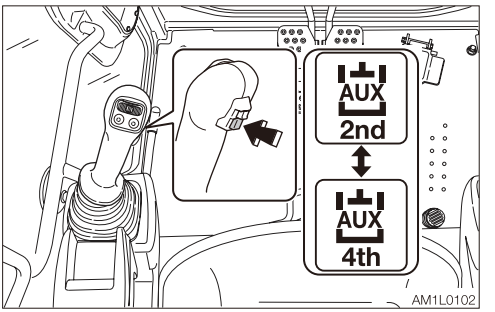
Move this switch to control the flow of the oil in the first auxiliary hydraulic lines.
(A).....Hydraulic oil flows to the left auxiliary line (a).
(B) .....Hydraulic oil flows to the right auxiliary line (b).
Refer to “Auxiliary hydraulic lines” on page 2-102.

AUXILIARY 2ND/4TH SWITCH

Slider switch
(Proportional control)
Proportional control allows for slow-to-fast/ fast-to-slow movement of attachment.
Example: If you move the slider switch half way, the attachment will move at approximately one-half the speed.

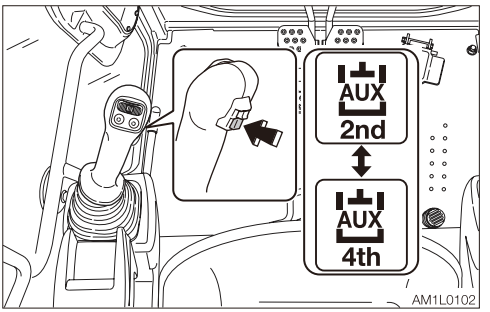


Move this switch to control the flow of the oil in the second auxiliary hydraulic lines.
(C): .....Hydraulic oil flows to the left auxiliary line (c).
(D): .....Hydraulic oil flows to the right auxiliary line (d).

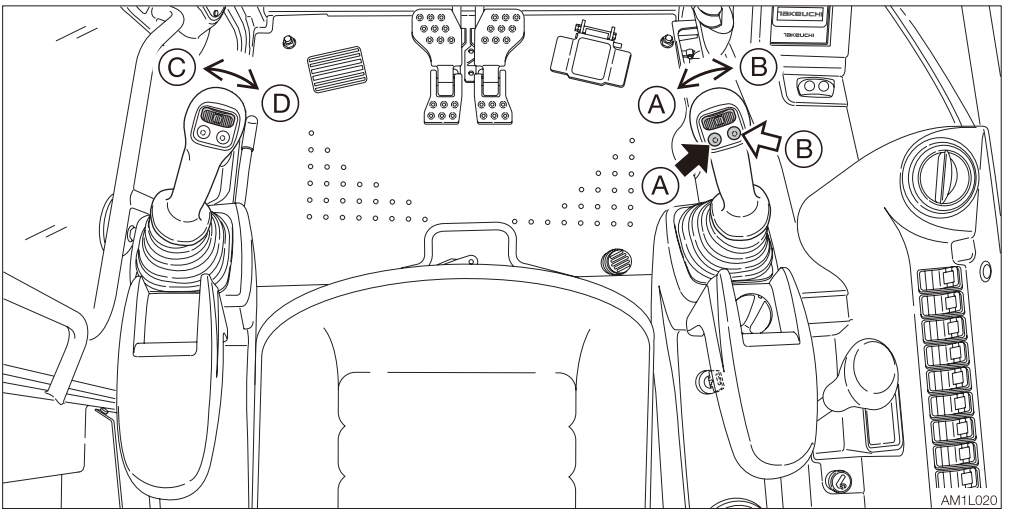


To use the auxiliary 4th hydraulic line, press the auxiliary 2/4 select button to change to the operation of the auxiliary 4th.
Refer to “Auxiliary hydraulic lines” on page 2-102.

AUXILIARY 2/4 SELECT BUTTON



This switch is used to change from the second auxiliary operation to the fourth auxiliary operation.
Pressing this button displays the second auxiliary on the Multi-information display to indicate that the second auxiliary operation is enabled. Pressing this button again displays the auxiliary 4th on the Multi-information display to indicate that the auxiliary 4th operation is enabled.
The actual operation is performed with the auxiliary 2nd/4th switch (slider switch).



Operating

Press those buttons to control the flow of the oil in the first/second auxiliary hydraulic lines.

(A).....Hydraulic oil flows to left auxiliary line (a).

(B) .....Hydraulic oil flows to right auxiliary line (b).

(C) .....Hydraulic oil flows to left auxiliary line (c).

(D) .....Hydraulic oil flows to right auxiliary line (d).

Refer to “Auxiliary hydraulic lines” on page 2-102.

Releasing the residual pressure

After the auxiliary hydraulic circuits have been used, pressure remains in the circuits. This is called the residual pressure. Release this residual pressure before disconnecting the lines.

Perform the residual pressure releasing within 10 minutes after the engine stopping.

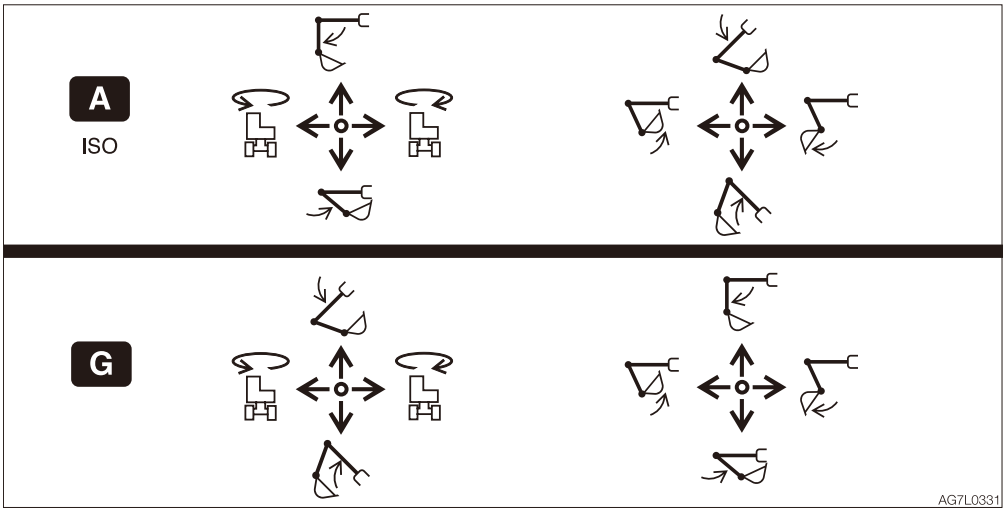
1. Park the machine on a flat, rigid and safe ground.
2. Stop the engine.
3. Lower the safety lock lever to the unlocked position.
4. Turn the starter switch to the ON position.
5. Press the auxiliary hydraulic switches several times to release the residual pressure in the auxiliary hydraulic circuitry.

SELECTING A LEVER PATTERN

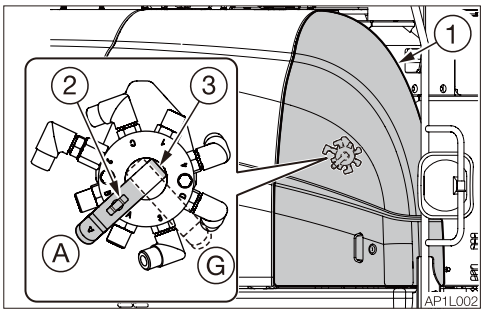
The operating pattern of the left and right operating levers can be changed.

⚠ WARNING

Before starting the engine, check the selector to see which operating pattern the left and right operating levers are set.



SWITCHING THE LEVER PATTERN



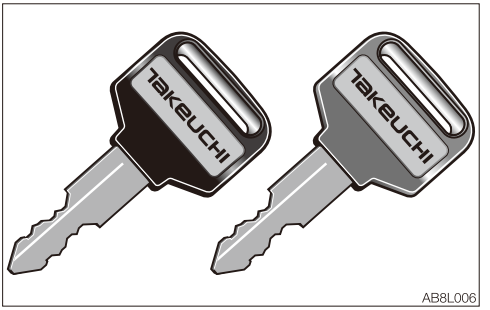
(A) : ISO pattern
(G) : G pattern

1. Park the machine on a flat and rigid ground, and stop the engine.
2. Fully open the cab door and fix it in place.
3. Remove the floor mat.
4. Open the front cover (1).
5. Tighten the wing bolt (2) and fasten the lever (3) in place.
6. Close the front cover (1).
7. Confirm the lever pattern.

TAKEUCHI SECURITY SYSTEM

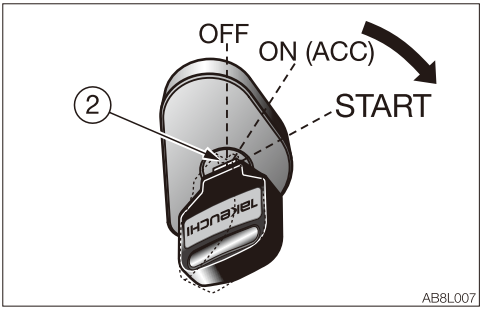
The Takeuchi Security System is a system that allows only registered starter keys to be used for starting the engine.
The engine cannot be started with any unregistered or counterfeit starter keys. If a registered starter key is lost or stolen, you can set the system to delete the registered key information, so that the lost or stolen key cannot be used to start the engine. Although machine theft cannot be completely prevented, the system certainly helps reduce the risk of theft.

STARTER KEY



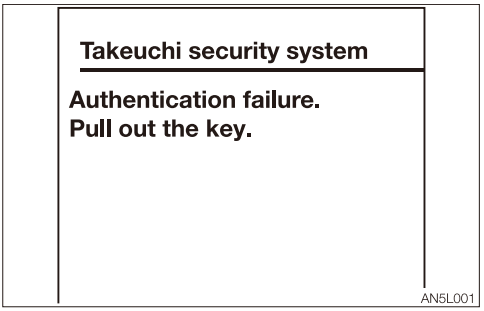
There are two types of starter key, red and black, which can be registered in the Takeuchi Security System.
The red key is the master key. The black key is the starting key.

STARTING THE ENGINE



The engine can be started using the normal method with a registered BLACK key.
The engine cannot be started using the RED master key.
Refer to “Starting and stopping the engine” on page 3-3.

If an attempt is made to start the engine with an unregistered key:



If an unregistered starter key is turned from the OFF to the ON (ACC) position, the message “Authentication failure” appears and the alarm starts sounding.
If this attempt is repeated five times in a row, the horn sounds for two minutes, and the engine cannot be started. The horn stops when the key is turned to the OFF position.

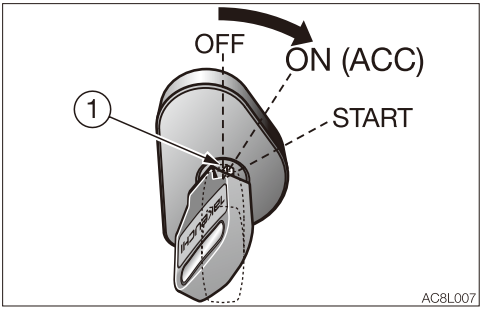
REGISTERING AND DELETING THE STARTER KEY

⚠ WARNING

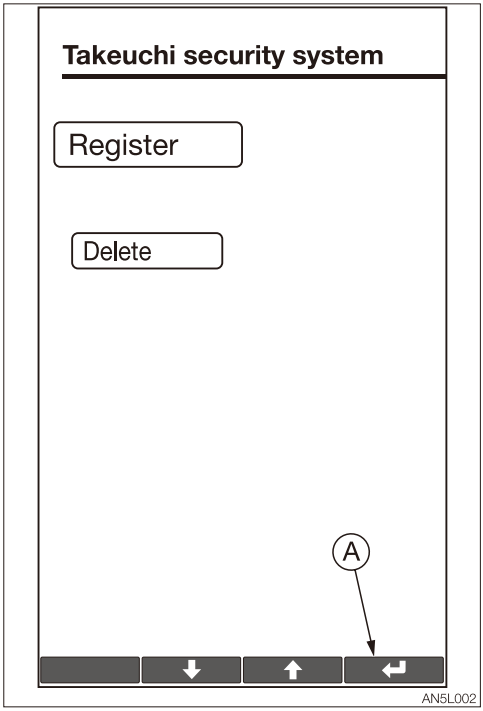
- **Sit on the operator's seat.**
- **Raise the safety lock lever to the locked position.**
- **Clear all people from the machine and the area.**
- **Sound the horn to warn people around the machine.**

Registration may fail if the starter key is on a keyring or keychain; remove it before starting registration.
A malfunction could occur if multiple starter keys are brought near to the key cylinder. Be sure that no starter keys other than the correct key are near the key cylinder during registration.

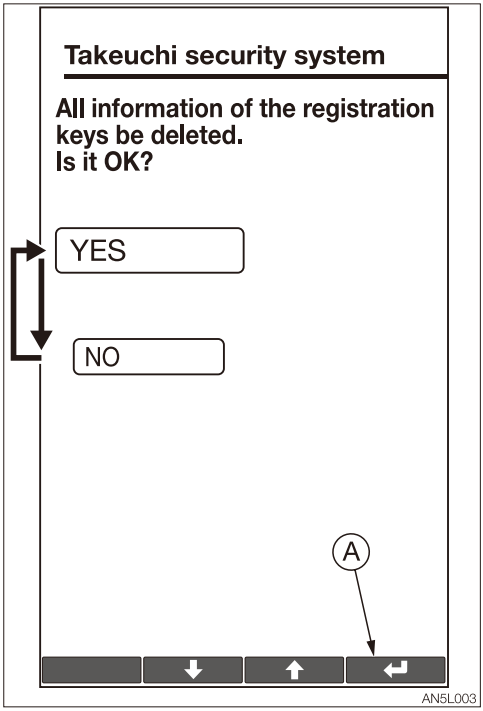
Starter key registration procedure
For Steps 1 to 6 below, complete each step and proceed to the next one within five minutes. If no operation is performed for five minutes during this procedure, the system returns to the initial state.
From Step 7 onward, the system automatically ends the operation if no operation is performed for five minutes.



1. Insert the master key (1) into the starter switch and turn the key from the OFF to the ON (ACC) position.

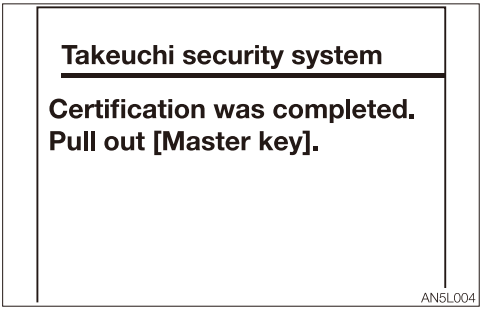


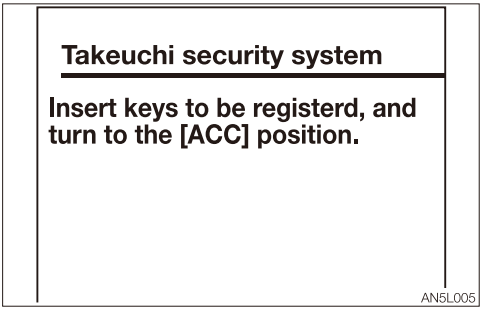
2. On the LCD, select “REGISTER” and tap (A).

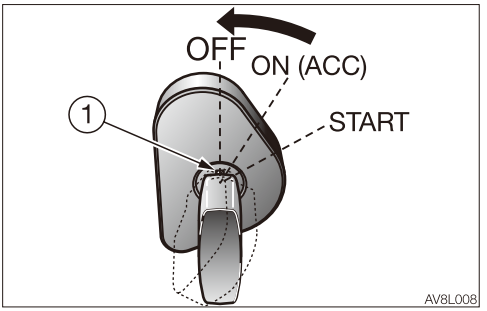


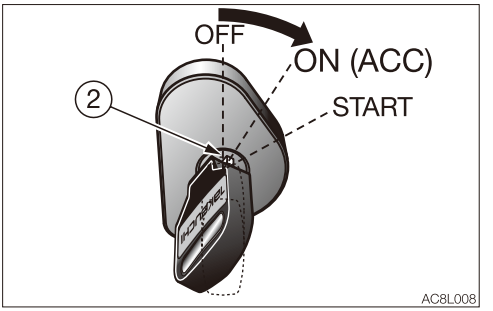
3. Select whether to delete all of the existing registration information.

   On the LCD, select “YES” and tap (A): All registration information will be deleted; register a new key.
   On the LCD, select “NO” and tap (A): A new starter key will be added to the existing registration information.



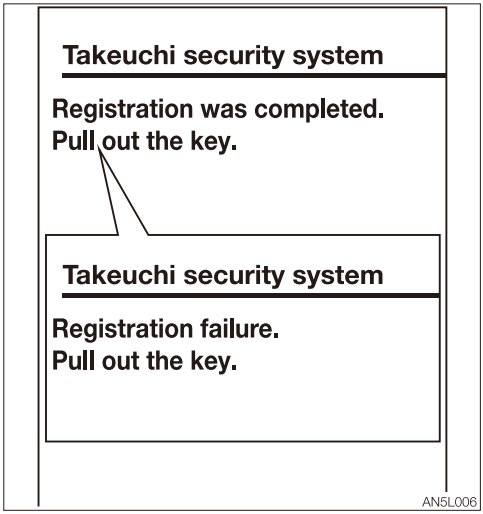




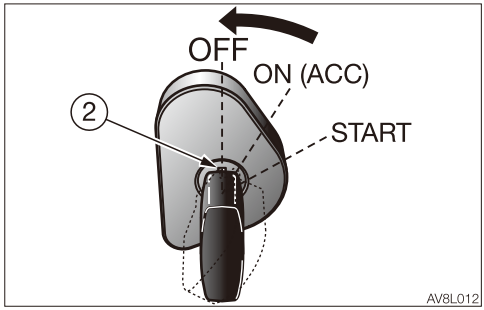


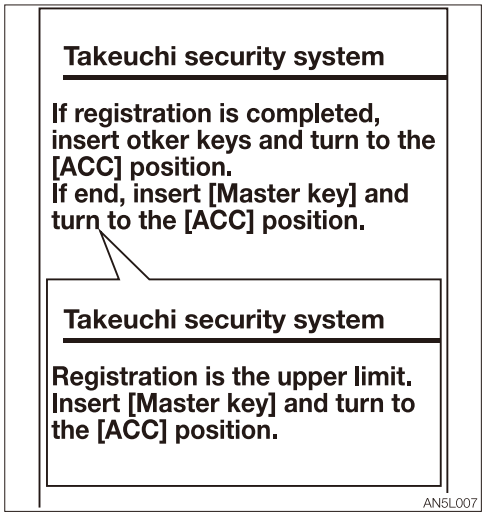
4. When the message “Certification was completed” appears on the LCD, turn the master key (1) from the ON (ACC) to the OFF position, and then remove it from the starter switch.
   The number (3) in the lower left indicates the number of starter keys currently registered (only for canopy). Up to 13 starter keys can be registered.

5. Insert the starter key (2) to be registered into the starter switch and turn the key from the OFF to the ON (ACC) position.

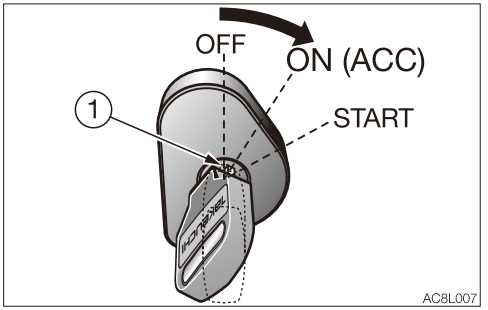


6. If the registration was successfully completed, the message “Registration was completed” appears. This means that the starter key (2) currently inserted has been registered.
   If the registration fails, the message “Registration failure” appears.

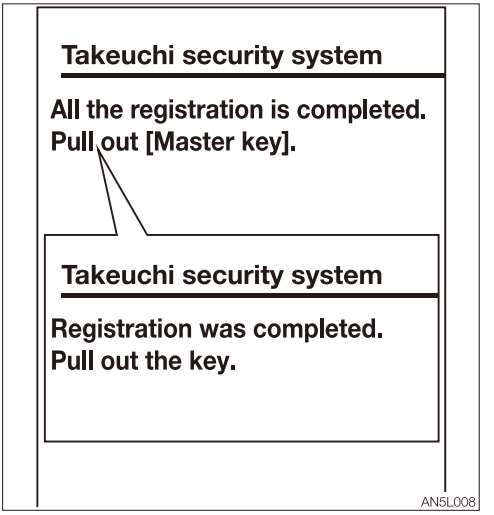




7. Turn the starter key (2) from the ON (ACC) to the OFF position, and then remove it from the starter switch.
   To continue registration, repeat the steps from Step 5.
   To end registration, proceed to Step 8.

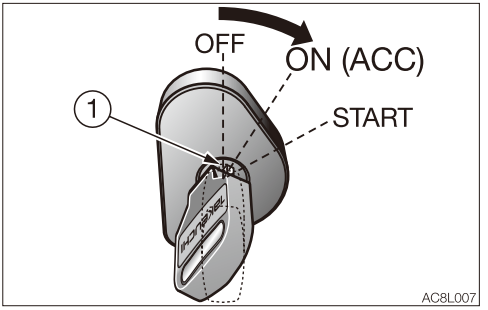


8. Insert the master key (1) into the starter switch and turn the key from the OFF to the ON (ACC) position. Or, wait for five minutes or more.

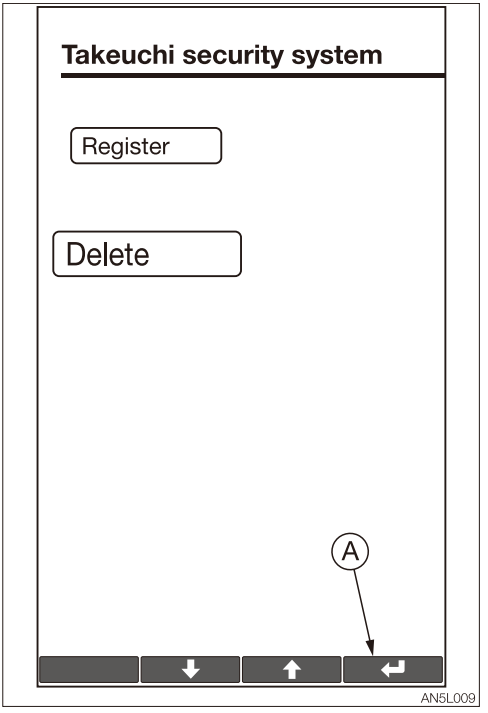


9. If any starter key has been registered, the message “All the registration is completed” appears. Turn the master key (1) from the ON (ACC) to the OFF position, and then remove it from the starter switch to complete the registration.
   If no starter key has been registered, the message “Registration failure” appears, and the registration information is returned to the initial state.

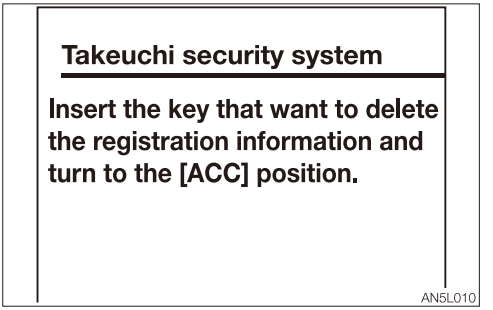
Deleting a registered starter key
The information of each registered starter key can be deleted to cancel its ability to start the engine.

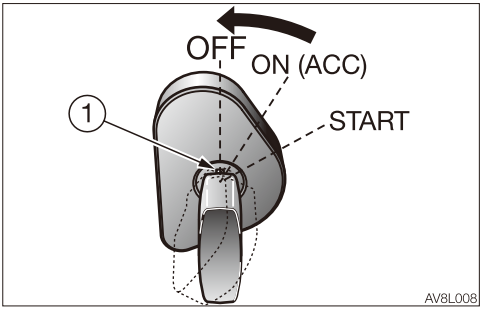


1. Insert the master key (1) into the starter switch and turn the key from the OFF to the ON (ACC) position.

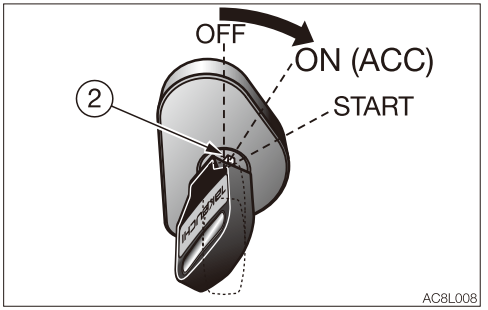


2. On the LCD, select “DELETE” and tap (A).

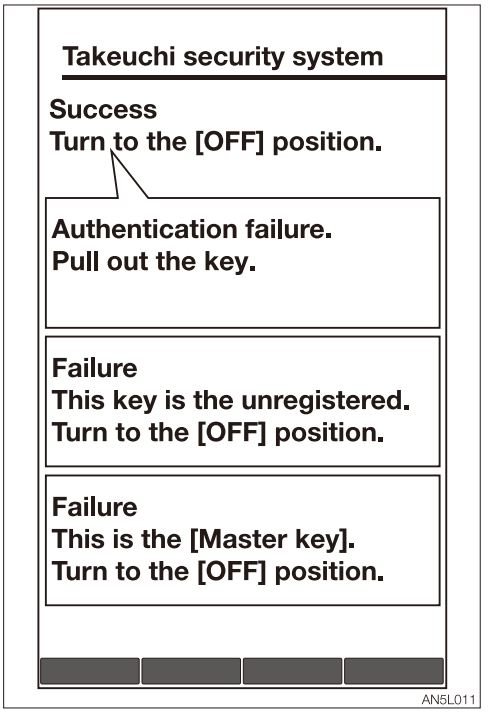




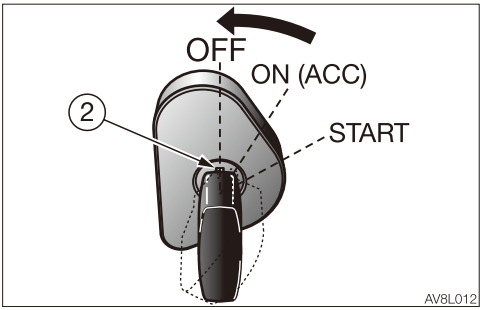
3. When the display shown as the illustration appears on the LCD, turn the master key (1) from the ON (ACC) to the OFF position, and then remove it from the starter switch.
Note: If the registered key is lost and you want to delete all registration information, please refer to “Registering and deleting the starter key” on page 8-24.



4. Insert the starter key (2) to be deleted into the starter switch and turn the key from the OFF to the ON (ACC) position.



5. If the deletion is successful, the message “Success” appears. This means that the information registered for the starter key (2) currently inserted has been deleted. If the deletion fails, the message “Failure” or “Authentication failure” appears on the LCD. Remove the starter key, and then repeat the steps from Step 1 again.



6. Turn the starter key (2) from the ON (ACC) to the OFF position, and then remove it from the starter switch.
To continue deletion, repeat the steps from Step 1.

IF THE MASTER KEY IS LOST

If you lose your master key, contact your service or sales dealer for assistance.

COUNTRIES WHERE THE SYSTEM CAN BE USED

To use the Takeuchi Security System, “radio wave authentication” must be obtained in the country where the system is to be used. The system can be used in the countries listed below, as of January 2017. Do not use the system in other countries. For details on how to disable the system, please contact your service or sales dealer for assistance.

Countries where the system can be used:
Ireland, Italy, UK, Estonia, Austria, Holland, Cyprus, Greece, Croatia, Sweden, Spain, Slovakia, Slovenia, Czech, Denmark, Germany, Hungary, Finland, France, Bulgaria, Belgium, Poland, Portugal, Malta, Latvia, Lithuania, Rumania, Luxemburg, Iceland, Norway, Liechtenstein, Switzerland, Turkey

TAKEUCHI FLEET MANAGEMENT (TFM)

⚠ CAUTION

- Never disassemble the TFM. It may cause injury or failure.
- Any damage to the TFM device or wire harness may cause damage to the device and surrounding equipment.



- Takeuchi Fleet Management (TFM) is a system that manages machine position information, operation information, and machine status using a communication device installed in the machine.
- Machines that support TFM are equipped with communication devices and are labeled as above.
- A communication contract is required to use TFM. Please contact our sales service for information regarding the contract.

IMPORTANT:

- The TFM equipment has been tested and found to comply with the limits for a Class A and Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against signal interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can emit radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause signal interference to radio communications.
- Operation of this equipment in a residential area may cause signal interference in which the user may be required to take additional steps to correct the interference. To correct any interference issue, move the TFM equipped machine away from the affected device, or, if possible; relocate the affected device away from the TFM equipped machine.
- The TFM device uses mobile communication. Therefore, it may not function properly in places where the signal is weak (buildings, tunnels, underground, etc.).
- The TFM device complies with the RF radiation exposure limits of the FCC Rules. The product is tested for a separation distance of 0 mm from human bodies. It is advised for those with specific sensitive conditions to avoid close device-body exposure.
- Please be aware that storing a machine long-term may result in the loss of communication from the TFM device if its internal battery is drained.
- The TFM device consumes a small amount of machine battery power even when the key is in the OFF position. For extended storage, refer to “Maintenance during extended storage period” on page 5-83.

Specification

M7H (For Europe)

Frequency	Power
UMTS/HSPA:	
900 MHz	0.25 W
2100 MHz	0.25 W
GSM/GPRS:	
900 MHz	2 W
1800 MHz	1 W
GSM/EDGE:	
900 MHz	0.5 W
1800 MHz	0.4 W

M7L (For North America)

Frequency	Power
LTE Band:	
700 MHz	0.2 W
850 MHz	0.2 W
1700 MHz (AWS)	0.2 W
1900 MHz	0.2 W
UMTS Band:	
850 MHz	0.25 W
1900 MHz	0.25 W

M7MG

Frequency	Power
LTE Band:	
700 MHz	0.2 W
850 MHz	0.2 W
1700 MHz (AWS)	0.2 W
1900 MHz	0.2 W
UMTS Band:	
850 MHz	0.25 W
1900 MHz	0.25 W

First Published September 2017
Twenty-second Published October 2025

AP2EN021

OPERATOR'S MANUAL

TB2150R Hydraulic excavator

Edited and issued by TAKEUCHI MFG. CO., LTD.

ZTR Control Systems, LLC

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FAX: 1-519-452-7764

www.ztr.com
info@ztr.com

February 1, 2018

RE: M8HZT / M8HZT-E / M8HBZ / M8HBZ-E Radio Equipment Directives (RED)

To whom it may concern,

This letter is to confirm that ZTR products **M8HZT / M8HZT-E / M8HBZ / M8HBZ-E** sufficiently demonstrate compliance to the Radio Equipment Directives (RED). The M8HZT-E is a superset of functionality of these other three devices and thereby is represented of compliant performance for the other three models.

The results of these tests can be found in **EMC Test Report (EMC_SL17052501-CAL-004-TTU4531HEW)**, issued on June 20, 2017. The tests were carried out by a notarized 3rd party certification lab **Siemic**.

This Declaration of Conformity is issued under the sole responsibility of ZTR Control Systems (or the manufacturer)

Please direct any test results questions or concern to ZTR's Engineering Group for clarification.

Regards,

Brent Horne
Director of Product Development
ZTR Control Systems

ZTR Control Systems, LLC

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London, Ontario, N6N 1E4
Tel: 1-519-452-1233
FAX: 1-519-452-7764

www.ztr.com
info@ztr.com

April 5, 2019

RE: M7H

To whom it may concern,

This letter is to confirm that ZTR product **M7H** sufficiently demonstrate compliance to CE and the Radio Equipment Directives (RED). The M7H satisfies all the technical regulations applicable to the product within the scope of Council Directives 2014/53/EU, 2015/35/EU and 2014/30/EU. The following tests were completed successfully.

EN 60950-1: 2006+A11: 2009+A1: 2010+A12: 2011+A2: 2013
EN62311:2008
ETSI EN 300 328 V2.1.1 (2016-05)
ETSI EN 303 413 V1.1.1 (2017-06)
Draft ETSI EN 301 489-52 V1.1.0 (2016-11)
Draft ETSI EN 301 489-17 V3.2.0 (2017-03)
Draft ETSI EN 301 489-1 V2.2.0 (2017-03)
Draft ETSI EN 301 489-19 V2.1.0 (2017-03)
EN 55032: 2015
ETSI EN 301 511 V12.5.1 (2017-03)
ETSI EN 301 908-1 V11.1.1 (2016-07)
ETSI EN 301 908-2 V11.1.2 (2017-08)

(Title(s) of regulations, standards, etc.)

All essential radio test suites have been carried out.

The tests were carried out by a notarized 3rd party certification lab MiCOM Labs inc.

This Declaration of Conformity is issued under the sole responsibility of ZTR Control Systems (or the manufacturer).

Please direct any test results questions or concern to ZTR's Engineering Group for clarification.

Regards,

Brent Horne
Director of Product Development
ZTR Control Systems

Trackunit Aps
Gasvaerksvej 24 4.sal, 9000 Aalborg, Denmark
www.trackunit.com

EU declaration of conformity

Hereby, Trackunit Aps declares that the radio equipment type **Trackunit M7MG** complies with the essential requirements of Directive 2014/53/EU.

3.1 (a) protection of health and safety of persons and of domestic animals and the protection of property, including the objectives with respect to safety requirements set out in Directive 2014/35/EU

Standard used: EN 62368-1:2020+A11:2020
EN 62311:2020
EN 62133-2:2012

3.1 (b) adequate level of electromagnetic compatibility as set out in Directive 2014/30/EU

Standard used: EN 301 489-1 V2.2.3
EN 301 489-17 V3.2.4
EN 301 489-19 V2.2.0
EN 301 489-52 V1.2.1

3.2 the equipment is so constructed that it both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.

Spectrum used:	Bluetooth:	2,402 – 2,480 GHz,	Max. 10 dBm EIRP
	Positioning:	1,559 – 1,610 GHz,	Receive only
	Cellular 4G:	B1, B3, B5, B8, B20, B28,	Max. 27 dBm EIRP
	Cellular 2G:	GSM/GPRS/EDGE; 900 / 1800	Max. 33 dBm EIRP

Standard used: EN 300 328 V2.2.2
EN 303 413 V1.2.1
EN 301 511 V12.5.1
EN 301 908-1 V13.1.1
EN 301 908-13 V13.1.1

Complies with the essential requirements of Directive 2011/65/EU and Directive 2015/863/EU on the Restriction of use of certain Hazardous Substances (RoHS 3).

Complies with the essential requirements of the Regulation 1907/2006/EC regarding Registration, Evaluation, Authorization and Restriction of Chemicals (REACh).

Complies with Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE).

Signed for and on behalf of Trackunit Aps
Aalborg, 01 December 2022

DocuSigned by:
Søren Brogaard
DBFCD953D519425...

Søren Brogaard, CEO

ASAHI DENSO
6-2-1 Somejidai, Hamakita-ku, Hamamatsu, Shizuoka 434-0046, Japan

EU DECLARATION of CONFORMITY (DoC)

This declaration of conformity is issued under the sole responsibility of the manufacturer:

Name:	ASAHI DENSO CO.,LTD
Address:	6-2-1 Somejidai, Hamakita-ku, Hamamatsu, Shizuoka, 434-0046 Japan

We declare that the DoC is issued under our sole responsibility and belongs to the following product.

Object of the declaration:

Product Name	Immobilizer
Model Name	CZ156
Accessories	N/A

The object of the declaration described above is in conformity with the relevant Union harmonization legislation:

Radio Equipment (RE) Directive (2014/53/EU)

The following harmonized standards and technical specifications have been applied:

Health & Safety (Article 3.1(a)):	EN 60065: 2014
EMC (Article 3.1(b)):	EN 301 489-1 V2.1.1 EN 301 489-3 V2.1.1 (Final draft)
Radio Spectrum (Article 3.2):	EN 300 330 V2.1.1

Japan, Shizuoka	May 29, 2017	Tomohiro Yaguchi
Place of Issue:	Date of Issue:	Tomohiro Yaguchi Section chief Engineering Department

ASAHI DENSO
6-2-1 Somejidai, Hamakita-ku, Hamamatsu, Shizuoka 434-0046, Japan

UK DECLARATION of CONFORMITY (DoC)

This declaration of conformity is issued under the sole responsibility of the manufacturer:

Name:	ASAHI DENSO CO.,LTD.
Address:	6-2-1 Somejidai, Hamakita-ku, Hamamatsu, Shizuoka, 434-0046 Japan

We declare that the DoC is issued under our sole responsibility and belongs to the following product.

Object of the declaration:

Product Name	Immobilizer
Model Name	CZ156
Accessories	N/A

The object of the declaration described above is in conformity with the relevant statutory requirements:

STATUTORY INSTRUMENTS 2017 No. 1206 TELECOMMUNICATIONS (The Radio Equipment Regulations 2017)

The following designated standards and technical specifications have been applied:

Health & Safety (Regulation 6.1(a)):	EN 62368-1: 2014
EMC (Regulation 6.1(b)):	EN 301 489-1 V2.1.1 EN 301 489-3 V2.1.1 (Final draft)
Radio Spectrum (Regulation 6.2):	EN 300 330 V2.1.1

Signed for and on behalf of:

Shizuoka, Japan	September 8, 2021	Tomohiro Yaguchi
Place of Issue:	Date of Issue:	Tomohiro Yaguchi Section chief Engineering Department

Declaration of Conformity

We herewith declare that the following named machine, based on its conception and design, and in the form brought into service is in accordance with the relevant, basic safety and health requirements of the following EU directives. In case of any alteration of the machine not coordinated with us, this certificate loses its validity.

Designation of the machine	Hydraulic Excavator
Manufacturer	TAKEUCHI MFG. CO., LTD 205 Uwadaira, Sakaki-machi, Hanishina-gun, Nagano 389-0605, Japan

Model	TB2150R <S/N 5148×××××>
Engine type	CFXI85BU (e1*97/68RA*2012/46* 0812*Δ)
Engine performance	85 kW @ 2000 rpm

The machine is in accordance with the requirements of EU directives:

1) Machinery Directive: 2006/42/EC and appendix
2) Electromagnetic Compatibility-Regulation: 2014/30/EU and appendix.
3) Noise Directive: 2000/14/EC (Evaluation procedure according to appendix VI), 2005/88/EC and appendices.
4) Regulations on engine emissions: 97/68/EC as last amended by Directive 2012/46/EC.

Harmonized norms: EN474-1:2022, EN474-5:2022

Compiler of the technical files:
Romain Loffredi
Takeuchi France S.A.S.
Parc d'Activités des Béthunes
3, avenue de la Mare 95310 SAINT OUEN L'AUMONE,
CS 29258 – SOA

Issued in Sakaki, Japan
Toshiya Takeuchi, President

Declaration of Conformity

We herewith declare that the following named machine, based on its conception and design, and in the form brought into service is in accordance with the relevant, basic safety and health requirements of the following EU directives. In case of any alteration of the machine not coordinated with us, this certificate loses its validity.

Designation of the machine	Hydraulic Excavator
Manufacturer	TAKEUCHI MFG. CO., LTD 205 Uwadaira, Sakaki-machi, Hanishina-gun, Nagano 389-0605, Japan

Model	TB2150R <S/N 5149×××××>
Engine type	C5VI85BU (e1*2016/1628*2016/1628EV5/D*0001*Δ)
Engine performance	85 kW @ 2000 rpm

The machine is in accordance with the requirements of EU directives:

1) Machinery Directive: 2006/42/EC and appendix
2) Electromagnetic Compatibility-Regulation: 2014/30/EU and appendix.
3) Noise Directive: 2000/14/EC (Evaluation procedure according to appendix VI), 2005/88/EC and appendices.
4) Regulations on engine emissions: Regulation (EU) 2016/1628, as last amended by Regulation 2016/1628.

Harmonized norms: EN474-1:2022, EN474-5:2022

Compiler of the technical files:
Romain Loffredi
Takeuchi France S.A.S.
Parc d'Activités des Béthunes
3, avenue de la Mare 95310 SAINT OUEN L'AUMONE,
CS 29258 – SOA

Issued in Sakaki, Japan
Toshiya Takeuchi, President

Declaration of Conformity

We herewith declare that we take full responsibility that the following named machine, based on its conception and design, and in the form brought into service is compliant with the relevant, basic safety and health requirements of the following (UK) enactments. In case of any alteration of the machine not coordinated with us, this certificate loses its validity.

Designation of the machine	Hydraulic Excavator
Manufacturer	TAKEUCHI MFG. CO., LTD 205 Uwadaira, Sakaki-machi, Hanishina-gun, Nagano 389-0605, Japan

Model	TB2150R <S/N 5149×××××>
Engine type	C5VI85BU (e1*2016/1628*2016/1628EV5/D*0001*Δ)
Engine performance	85 kW @ 2000 rpm

The machine is compliant with the following UK enactments:

1) Supply of Machinery (Safety) Regulations 2008 (S.I. 2008/1597)
2) Electromagnetic Compatibility Regulations 2016 (S.I. 2016/1091)
3) Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001 (S.I. 2001/1701)

And the Designated Standards referred to and adopted therein and particularly EN474-1:2022, EN474-5:2022

Compiler of the technical files:
Daniel Bryning (Product Manager)
TAKEUCHI MFG. (UK) Ltd.
Unit E2B, John Boyd Dunlop Drive
Kingsway Business Park Rochdale OL16 4NG

Issued in Sakaki, Japan
Toshiya Takeuchi, President

WARNING: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

WARNING:

Cancer and Reproductive Harm –
www.P65Warnings.ca.gov

About the emission warranty statements
Please view the DEUTZ warranty statements which are accessible on the official DEUTZ website:
https://www.deutz.com/en/about-us/warranty-statement/

