

Operation & Maintenance Manual

DUMP TRUCK

GALEO

HD465-7

HD605-7

SERIAL NUMBERS HD465-7001 and up
HD605-7001

⚠ WARNING

Unsafe Use of this machine may cause serious injury or Death. Operators and maintenance personnel must read this manual before operating or maintaining this machine. This manual should be kept near the machine for reference and periodically reviewed by all personnel who will come into contact with it.

NOTICE

Komatsu has Operation & Maintenance Manuals written in some other languages. If a foreign language manual is necessary, contact your local distributor for availability.

KOMATSU

FOREWORD

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

CALIFORNIA

Proposition 65 Warning

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Wash hands after handling.

FOREWORD

This manual provides rules and guidelines which will help you use this machine safely and effectively. The precautions in this manual must be followed at all times when performing operation and maintenance. Most accidents are caused by the failure to follow fundamental safety rules for the operation and maintenance of machines. Accidents can be prevented by knowing beforehand conditions that may cause a hazard when performing operation and maintenance.



WARNING

Operators and maintenance personnel must always do as follows before beginning operation or maintenance.

- Always be sure to read and understand this manual thoroughly before performing operation and maintenance.
- Read the safety messages given in this manual and the safety labels affixed to the machine thoroughly and be sure that you understand them fully.

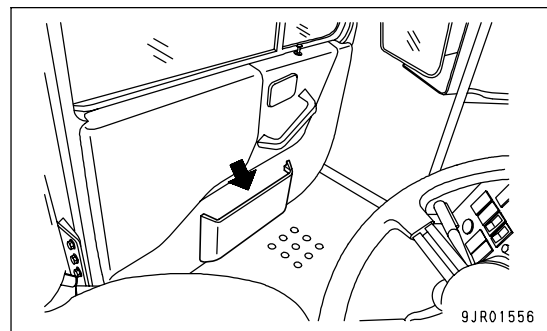
Keep this manual in the storage location for the operation and maintenance manual given below, and have all personnel read it periodically.

If this manual has been lost or has become dirty and cannot be read, request a replacement manual immediately from Komatsu or your Komatsu distributor.

If you sell the machine, be sure to give this manual to the new owners together with the machine.

Komatsu delivers machines that comply with all applicable regulations and standards of the country to which it has been shipped. If this machine has been purchased in another country or purchased from someone in another country, it may lack certain safety devices and specifications that are necessary for use in your country. If there is any question about whether your product complies with the applicable standards and regulations of your country, consult Komatsu or your Komatsu distributor before operating the machine.

Storage location for the Operation and Maintenance Manual:
On inside of left door



EMISSION CONTROL WARRANTY

EMISSION CONTROL WARRANTY STATEMENT (APPLIES TO CANADA ONLY)

1. Products Warranted

Komatsu America International Company, Komatsu Mining Systems Inc. and Komatsu Utility Corporation (collectively "Komatsu") produce and/or market products under brand names of Komatsu, Dresser, Dressta, Haulpak and Galion. This emissions warranty applies to new engines bearing the Komatsu name installed in these products and used in Canada in machines designed for industrial off-highway use. This warranty applies only to these engines produced on or after January 1, 2000. This warranty will be administered by Komatsu distribution in Canada.

2. Coverage

Komatsu warrants to the ultimate purchaser and each subsequent purchaser that the engine is designed, built and equipped so as to conform, at the time of sale by Komatsu, with all U.S. Federal emission regulations applicable at the time of manufacture and that it is free from defects in workmanship or material which would cause it not to meet these regulations within five years or 3,000 hours of operation, whichever occurs first, as measured from the date of delivery of the engine to the ultimate purchaser.

3. Limitations

Failures, other than those resulting from defects in materials or workmanship, are not covered by this warranty. Komatsu is not responsible for failures or damage resulting from what Komatsu determines to be abuse or neglect, including, but not limited to: operation without adequate coolant or lubricants; over fueling; over speeding; lack of maintenance of lubricating, cooling or intake systems; improper storage, starting, warm-up, run-in or shutdown practices; unauthorized modifications of the engine. Komatsu is also not responsible for failures caused by incorrect fuel or by water, dirt or other contaminants in the fuel. Komatsu is not responsible for non-engine repairs, "downtime" expense, related damage, fines, all business costs or other losses resulting from a warrantable failure.

KOMATSU IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

This warranty, together with the express commercial warranties, are the sole warranties of Komatsu. **THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

GARANTIE SUR LE CONTRÔLE DES ÉMISSIONS

ÉNONCÉ DE GARANTIE SUR LE CONTRÔLE DES ÉMISSIONS (APPLICABLE AU CANADA SEULEMENT):

1. Produits garantis:

Komatsu America International Company, Komatsu Mining Systems Inc. et Komatsu Utility Corporation (collectivement Komatsu) produisent et/ou font la mise en marché de produits portant les noms de marque Komatsu, Dresser, Dressta, Haulpak et Galion. Cette garantie sur les émissions s'applique à tous les nouveaux moteurs portant le nom Komatsu, installés dans ces produits et utilisés au Canada dans des machines conçues pour utilisation industrielle non-roulière. Cette garantie s'applique seulement sur les moteurs produits à partir du 1er Janvier 2000. Cette garantie sera administrée par la distribution de Komatsu au Canada.

2. Couverture:

Komatsu garantit à l'acheteur ultime et chaque acheteur subséquent que le moteur est conçu, construit et équipé en toute conformité, au moment de la vente par Komatsu, avec toutes les Réglementations fédérales américaines sur les émissions applicables au moment de la fabrication et qu'il est exempt de défauts de construction ou de matériaux qui auraient pour effet de contrevenir à ces réglementations en dedans de 5 ans ou 3000 heures d'opération, mesuré à partir de la date de livraison du moteur au client ultime.

3. Limitations:

Les bris, autres que ceux résultant de défauts de matériaux ou de construction, ne sont pas couverts par cette Garantie. Komatsu n'est pas responsable pour bris ou dommages résultant de ce que Komatsu détermine comme étant de l'abus ou négligence, incluant mais ne se limitant pas à: l'opération sans lubrifiants ou agent refroidissants adéquats; la suralimentation d'essence; la survitesse; le manque d'entretien des systèmes de lubrification, de refroidissement ou d'entrée; de pratiques non-propices d'entreposage, de mise en marche, de réchauffement, de conditionnement ou d'arrêt; les modifications non-autorisées du moteur. De plus, Komatsu n'est pas responsable de bris causés par de l'essence inadéquate ou de l'eau, des saletés ou autres contaminants dans l'essence. Komatsu n'est pas responsable des réparations non-relées au moteur, des dépenses encourues suite aux temps d'arrêts, des dommages relatifs, amendes, et de tout autre coût d'affaires ou autres pertes résultant d'un bris couvert par la garantie.

KOMATSU N'EST PAS RESPONSABLE DES INCIDENTS OU DOMMAGES CONSÉQUENTS.

Cette garantie, ainsi que les garanties expresses commerciales, sont les seules garanties de Komatsu. **IL N'Y A AUCUNE AUTRE GARANTIE, EXPRESSE OU SOUS-ENTENDUE, MARCHANDABLE OU PROPICE A UNE UTILISATION PARTICULIÈRE.**

INFORMATION IMPORTANTE SUR LE MOTEUR
 CE MOTEUR EST CONFORME AUX NORMES AMÉRICAINES DE L'EPA (ANNÉE DU MODÈLE) ET DE LA CALIFORNIE POUR LES MOTEURS LARGES NON-ROUTIERS À IGNITION PAR COMPRESSION. CE MOTEUR EST CERTIFIÉ POUR OPÉRER À ESSENCE DIESEL.

AVERTISSEMENT
 DES BLESSURES PEUVENT RÉSULTER ET LA GARANTIE S'ANNULER SI LES RPM DU TAUX D'ESSENCE OU L'ALTITUDE EXCÈDENT LES VALEURS MAXIMALES PUBLIÉES POUR CE MODÈLE ET SON APPLICATION.

IMPORTANT ENGINE INFORMATION
 THIS ENGINE CONFORMS TO YYYY MODEL YEAR U.S. EPA REGULATION AND THE CALIFORNIA REGULATIONS LARGE NON ROAD COMPRESSION IGNITION ENGINES. THIS ENGINE IS CERTIFIED TO OPERATE ON DIESEL FUEL.

WARNING
 INJURY MAY RESULT AND WARRANTY IS VOIDED IF FUEL RATE RPM OR ALTITUDES EXCEED PUBLISHED MAXIMUM VALUES FOR THIS MODEL AND APPLICATION.

ENGINE MODEL	SERIAL NO.	DISPLACEMENT	LITERS
ENGINE FAMILY			
EXHAUST EMISSION CONTROL SYSTEM		FIRING ORDER	1 - 5 - 3 - 6 - 2 - 4
ADV. LOAD OUTPUT	Kw (HP)	RPM	
VALVE LASH COLD (mm)	IN. EX.	FUEL RATE AT ADV.	mm ³ /STROKE
IDLE SPEED	RPM	FAMILY EMISSION LIMIT	
INITIAL INJECTION TIMING	DEG. BTDC	DATE OF MANUFACTURE	
KOMATSU LTD. MADE IN JAPAN			

MODÈLE DU MOTEUR

FAMILLE DU MOTEUR

SYSTÈME DE CONTRÔLE DES ÉMISSIONS D'ÉCHAPPEMENT

CHARGE DE SORTIE ADV.

PORTÉE DE VALVE À FROID (mm)

VITESSE STATIQUE

RÉGLAGE DE L'ALLUMAGE - INJECTION INITIALE

DEG. BTDC

NO. SÉRIE

DÉPLACEMENT

LITRES

SÉQUENCE DE MISE À FEU

mm³/BAITTEMENT

TAUX D'ESSENCE À ADV.

LIMITE D'ÉMISSION DE LA FAMILLE

DATE DE FABRICATION

KOMATSU LTD. FABRIQUÉ AU JAPON

ENGINE DATAPLATE - ENGLISH / FRENCH




SAFETY INFORMATION

To enable you to use this machine safely, safety precautions and labels are given in this manual and affixed to the machine to give explanations of situations involving potential hazards and of the methods of avoiding such situations.

Signal words

The following signal words are used to inform you that there is a potential hazardous situation that may lead to personal injury or damage.

In this manual and on machine labels, the following signal words are used to express the potential level of hazard.

- | | |
|--|---|
|  DANGER | Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. |
|  WARNING | Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. |
|  CAUTION | Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. This word is used also to alert against unsafe practices that may cause property damage. |

Example of safety message using signal word

 WARNING
When standing up from the operator's seat, always place the safety lock lever in the LOCK position. If you accidentally touch the control levers when they are not locked, this may cause a serious injury or death.

Other signal words

In addition to the above, the following signal words are used to indicate precautions that should be followed to protect the machine or to give information that is useful to know.

NOTICE This word is used for precautions that must be taken to avoid actions which could shorten the life of the machine.

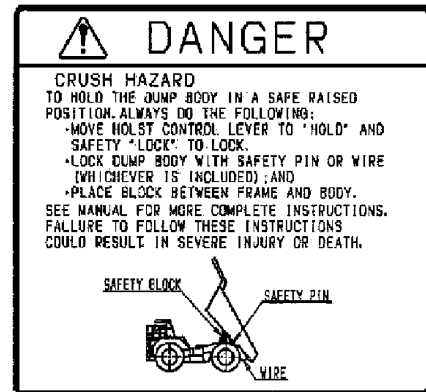
REMARKS This word is used for information that is useful to know.

- Safety labels

Safety labels are affixed to the machine to inform the operator or maintenance worker on the spot when carrying out operation or maintenance of the machine that may involve hazard.

This machine uses "Safety labels using words" and "Safety labels using pictograms" to indicate safety procedures.

Example of safety label using words



Safety labels using pictogram

Safety pictograms use a picture to express a level of hazardous condition equivalent to the signal word. These safety pictograms use pictures in order to let the operator or maintenance worker understand the level and type of hazardous condition at all times. Safety pictograms show the type of hazardous condition at the top or left side, and the method of avoiding the hazardous condition at the bottom or right side. In addition, the type of hazardous condition is displayed inside a triangle and the method of avoiding the hazardous condition is shown inside a circle.



Komatsu cannot predict every circumstance that might involve a potential hazard in operation and maintenance. Therefore, the safety messages in this manual and on the machine may not include all possible safety precautions. If any procedures or actions not specifically recommended or allowed in this manual are used, it is your responsibility to take the necessary steps to ensure safety.

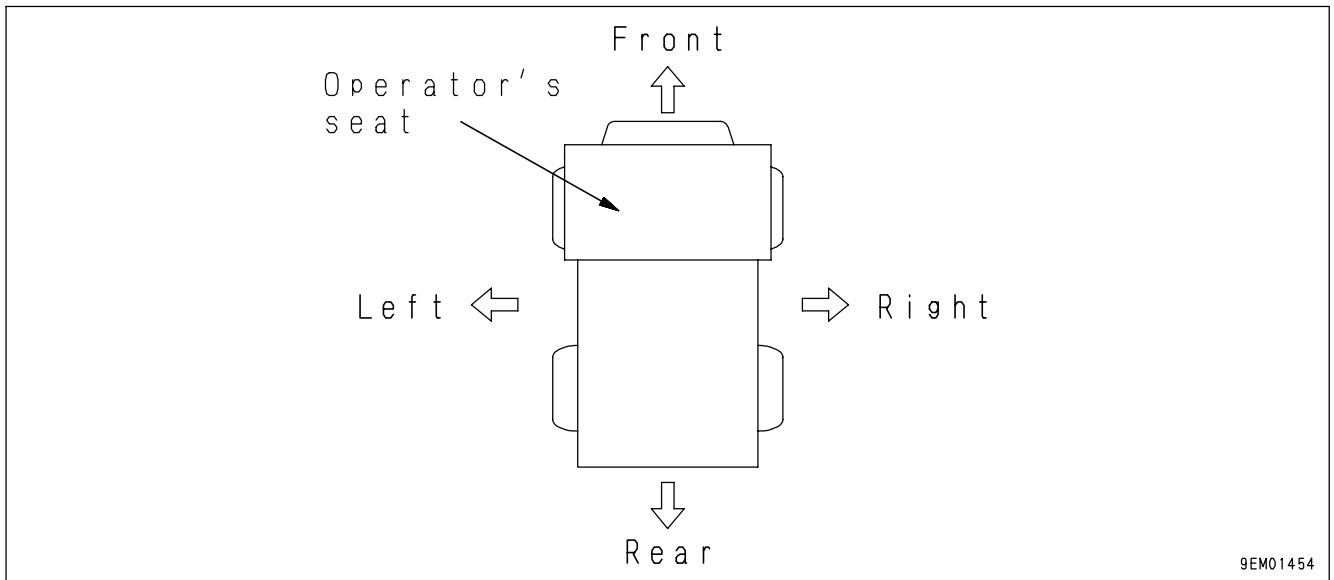
In no event should you engage in prohibited uses or actions described in this manual.

The explanations, values, and illustrations in this manual were prepared based on the latest information available at that time. Continuing improvements in the design of this machine can lead to changes in detail which may not be reflected in this manual. Consult Komatsu or your Komatsu distributor for the latest available information of your machine or for questions regarding information in this manual.

The numbers in circles in the illustrations correspond to the numbers in () in the text. (For example: ① -> (1))

INTENDED USE

DIRECTIONS OF MACHINE



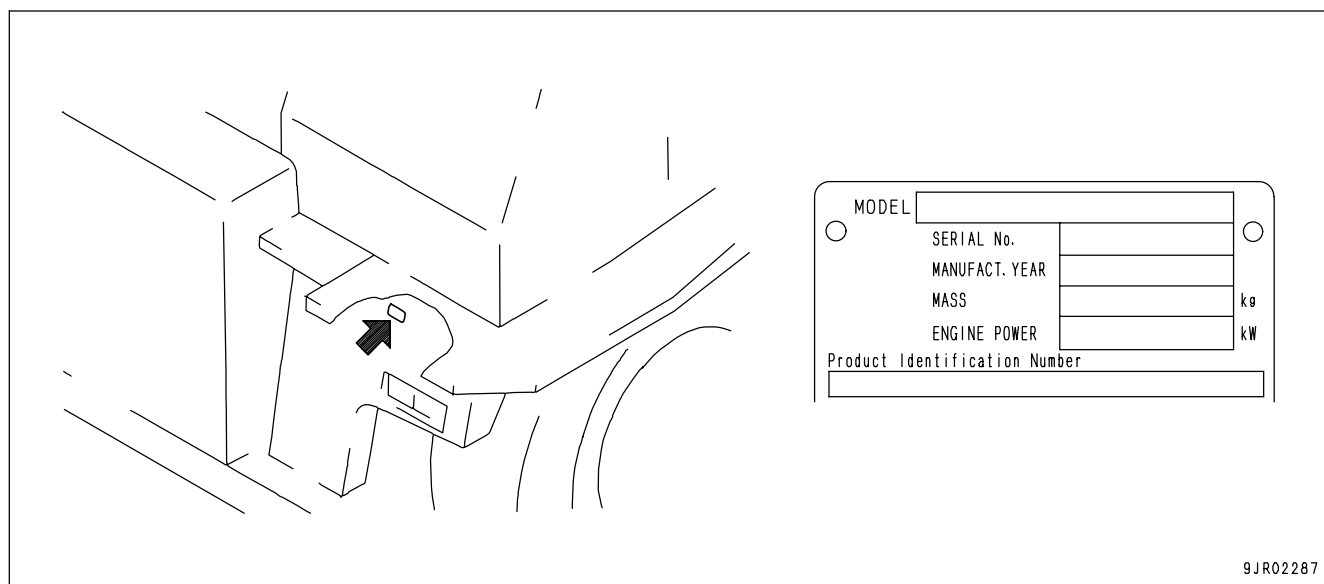
In this manual, the directions of the machine (front, rear, left, right) are determined according to the view from the operator's seat in the direction of travel (front) of the machine.

LOCATION OF PLATES, TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR

When requesting service or ordering replacement parts, please inform your Komatsu distributor of the following items.

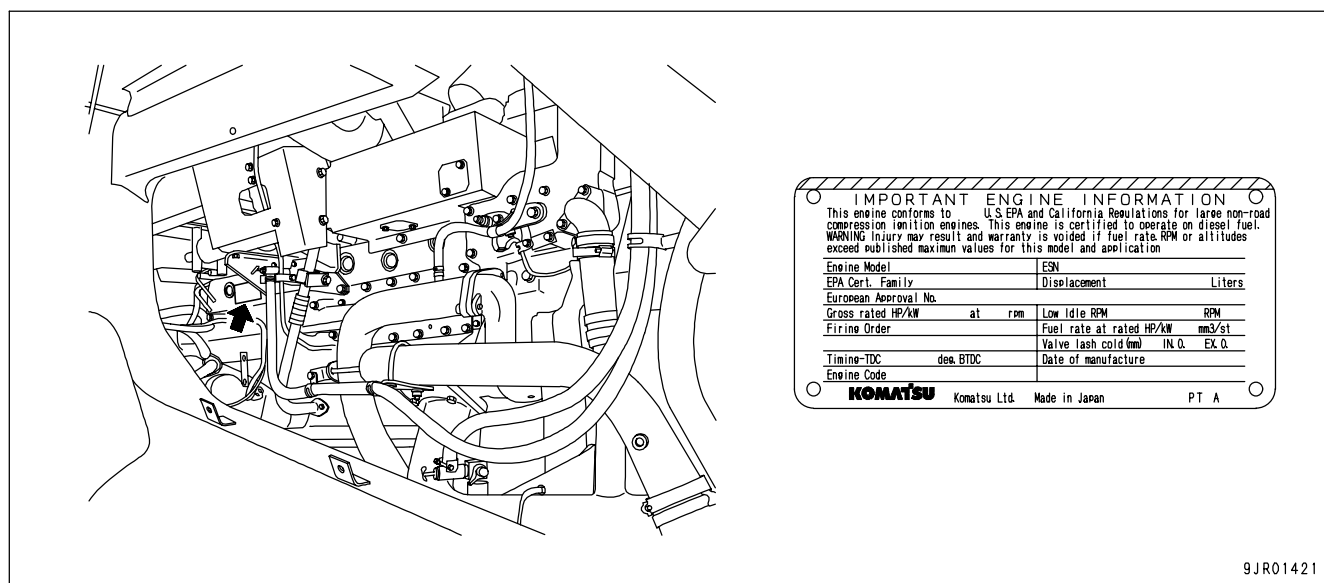
PRODUCT IDENTIFICATION NUMBER (PIN)/MACHINE SERIAL NO. PLATE

It is located on the left front end of the frame.
The design of the nameplate differs according to the territory.



ENGINE SERIAL NO. PLATE

It is located on the upper left side of the engine cylinder block if you look from the fan side.



SERVICE METER POSITION

It is at the center bottom of the machine monitor.

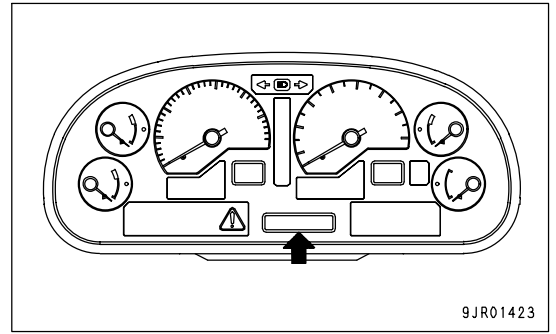


TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR

Machine serial No.	
Engine serial No.	
Product identification number (PIN)	
Distributor name	
Address	-----

Service Personnel	
Phone/Fax	

CONTENTS

FOREWORD	1- 1
FOREWORD	1- 2
SAFETY INFORMATION	1- 5
INTENDED USE	1- 7
DIRECTIONS OF MACHINE	1- 7
LOCATION OF PLATES, TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR	1- 8
PRODUCT IDENTIFICATION NUMBER (PIN)/MACHINE SERIAL NO. PLATE	1- 8
ENGINE SERIAL NO. PLATE	1- 8
SERVICE METER POSITION	1- 9
TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR	1- 9
SAFETY	2- 1
SAFETY INFORMATION	2- 2
SAFETY LABELS	2- 4
POSITION FOR ATTACHING SAFETY LABELS	2- 5
SAFETY LABELS	2- 6
GENERAL PRECAUTIONS	2- 10
PRECAUTIONS DURING OPERATION	2- 18
STARTING ENGINE	2- 18
OPERATION	2- 20
TRANSPORTATION	2- 23
BATTERY	2- 24
TOWING	2- 26
PRECAUTIONS FOR MAINTENANCE	2- 27
PRECAUTIONS WITH TIRES	2- 33
OPERATION	3- 1
GENERAL VIEW	3- 2
GENERAL VIEW OF MACHINE	3- 2
GENERAL VIEW OF CONTROLS AND GAUGES	3- 3
EXPLANATION OF COMPONENTS	3- 5
MACHINE MONITOR	3- 5
OTHER FUNCTIONS OF MACHINE MONITOR	3- 26
SWITCHES	3- 29
CONTROL LEVERS AND PEDALS	3- 38
MECHATRONICS EQUIPMENT CONTROLLER	3- 43
SAFETY PIN	3- 44
DUST INDICATOR	3- 44
FUSES	3- 45
CAR RADIO	3- 50
CAR STEREO	3- 56
AIR CONDITIONER	3- 64
OPERATION	3- 68
CHECK BEFORE STARTING ENGINE	3- 68
STARTING ENGINE	3- 82
OPERATIONS, CHECKS AFTER STARTING ENGINE	3- 85
STOPPING ENGINE	3- 86
CHECKS AFTER STOPPING ENGINE	3- 86
MOVING MACHINE OFF (FORWARD, REVERSE), STOPPING	3- 87
SHIFTING GEAR	3- 92
TRAVELING DOWNHILL	3- 94

STEERING THE MACHINE	3-108
LOADING OPERATIONS	3-108
DUMP OPERATIONS	3-109
PRECAUTIONS FOR OPERATION	3-110
PARKING MACHINE	3-111
CHECKS AFTER COMPLETION OF WORK	3-112
LOCKING	3-112
HANDLING TIRES	3-113
DETERMINING AND MAINTAINING TRAVEL ROAD	3-116
DETERMINING TRAVEL ROAD	3-116
MAINTAINING TRAVEL ROAD	3-116
TRANSPORTATION	3-117
PRECAUTIONS WHEN TRANSPORTING	3-117
STEPS FOR TRANSPORTATION	3-117
METHOD OF SECURING MACHINE	3-118
METHOD OF LIFTING MACHINE	3-119
COLD WEATHER OPERATION	3-121
PRECAUTIONS FOR LOW TEMPERATURE	3-121
PRECAUTIONS AFTER COMPLETION OF WORK	3-122
AFTER COLD WEATHER	3-123
LONG-TERM STORAGE	3-124
BEFORE STORAGE	3-124
DURING STORAGE	3-124
AFTER STORAGE	3-124
PRECAUTIONS BEFORE TRAVELING AFTER LONG-TERM STORAGE	3-124
TROUBLESHOOTING	3-125
AFTER RUNNING OUT OF FUEL	3-125
METHOD OF TOWING MACHINE	3-125
IF BATTERY IS DISCHARGED	3-129
OTHER TROUBLE	3-133
MAINTENANCE	4- 1
GUIDES TO MAINTENANCE	4- 2
OUTLINE OF SERVICE	4- 4
HANDLING OIL, FUEL, COOLANT, AND PERFORMING OIL CLINIC	4- 4
OUTLINE OF ELECTRIC SYSTEM	4- 7
WEAR PARTS	4- 8
WEAR PARTS LIST	4- 8
RECOMMENDED FUEL, COOLANT, AND LUBRICANT	4- 9
USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE	4- 10
RECOMMENDED BRANDS, RECOMMENDED QUALITY FOR PRODUCTS OTHER THAN KOMATSU GENUINE OIL	4- 12
STANDARD TIGHTENING TORQUES FOR BOLTS AND NUTS	4- 13
TORQUE LIST	4- 13
PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS	4- 15
SAFETY CRITICAL PARTS	4- 15
MAINTENANCE SCHEDULE CHART	4- 16
MAINTENANCE SCHEDULE CHART	4- 16
SERVICE PROCEDURE	4- 18
INITIAL 250 HOURS SERVICE (ONLY AFTER THE FIRST 250 HOURS)	4- 18
INITIAL 2000 HOURS SERVICE (ONLY AFTER THE FIRST 2000 HOURS)	4- 18

WHEN REQUIRED -----	4- 19
CHECK BEFORE STARTING -----	4- 39
EVERY 250 HOURS SERVICE -----	4- 40
EVERY 500 HOURS SERVICE -----	4- 51
EVERY 1000 HOURS SERVICE -----	4- 58
EVERY 2000 HOURS SERVICE -----	4- 65
EVERY 4000 HOURS SERVICE -----	4- 70
EVERY 15000 HOURS SERVICE -----	4- 71
SPECIFICATIONS -----	5- 1
SPECIFICATIONS -----	5- 2
ATTACHMENTS, OPTIONS -----	6- 1
SELECTING DUMP BODY -----	6- 2
HANDLING TACHOGRAPH (TCO20-90W) -----	6- 3
EXPLANATION OF COMPONENTS -----	6- 3
METHOD OF USE -----	6- 5
HANDLING AIR SUSPENSION SEAT -----	6- 9
SEAT ADJUSTMENT -----	6- 9
REMOVAL AND INSTALLATION OF HEADREST -----	6- 11
HANDLING VEHICLE HEALTH MONITORING SYSTEM (VHMS) -----	6- 12
OUTLINE OF SYSTEM -----	6- 12
BASIC PRECAUTIONS -----	6- 13
CHECK BEFORE STARTING -----	6- 13
PROCEDURE WHEN DOWNLOADING -----	6- 16
OTHER PRECAUTIONS -----	6- 16
HANDLING AUTOMATIC SPIN REGULATOR (ASR) -----	6- 17
EXPLANATION OF COMPONENTS -----	6- 17
ACTUATION OF ASR SYSTEM -----	6- 18
PRECAUTIONS WHEN USING -----	6- 18
TROUBLESHOOTING -----	6- 19
BLEEDING AIR FROM ASR CIRCUIT -----	6- 20
HANDLING PAYLOAD METER (VHMS BUILT-IN TYPE) -----	6- 21
OUTLINE OF SYSTEM -----	6- 21
NORMAL OPERATION DISPLAY -----	6- 22
EXTERNAL DISPLAY LAMPS -----	6- 24
PERFORMING CALIBRATION -----	6- 25
DATA STORED IN PAYLOAD METER -----	6- 27
PROCEDURE WHEN DOWNLOADING -----	6- 27
MACHINE ID, OPEN ID -----	6- 31
PAYLOAD (CYCLE DATA ITEM) -----	6- 33
SERVICE FUNCTIONS -----	6- 33
OTHERS -----	6- 33
HANDLING PAYLOAD METER II (CARD TYPE) -----	6- 34
METHOD OF USING ACCURATELY -----	6- 35
GENERAL LOCATIONS -----	6- 36
CONTENT OF DISPLAY (CONTROLLER, EXTERNAL DISPLAY LAMPS) -----	6- 41
EXTERNAL DISPLAY LAMPS -----	6- 45
DETAILS OF DATA STORED IN MEMORY OF PAYLOAD METER -----	6- 47
OPERATION OF SWITCHES -----	6- 52
PROBLEM AND WARNING DISPLAY (ERROR CODE) -----	6- 75
WHEN ERROR CODE F-09 IS DISPLAYED (PROCEDURE FOR REPLACING BATTERY) -----	6- 82

OPERATION WHEN ERROR CODE F.CAL IS DISPLAYED OR CONTROLLER IBEEN REPLACED -----	6- 85
HANDLING BATTERY ISOLATOR -----	6- 88
HANDLING AUTO-GREASING SYSTEM -----	6- 89
METHOD OF OPERATING AUTO-GREASING SYSTEM -----	6- 89
PRECAUTIONS WHEN HANDLING AUTO-GREASING SYSTEM -----	6- 96
TROUBLESHOOTING -----	6- 96
HANDLING ABS -----	6- 97
EXPLANATION OF COMPONENTS -----	6- 97
ABS SYSTEM CHECK AFTER STARTING ENGINE -----	6- 99
OPERATION OF ABS -----	6- 99
PRECAUTIONS WHEN USING -----	6-100
TROUBLESHOOTING -----	6-101
INDEX -----	7- 1

SAFETY

WARNING

Please read and make sure that you fully understand the precautions described in this manual and the safety labels on the machine. When operating or servicing the machine, always follow these precautions strictly.

SAFETY INFORMATION

SAFETY LABELS	2- 4
POSITION FOR ATTACHING SAFETY LABELS	2- 5
SAFETY LABELS	2- 6
GENERAL PRECAUTIONS	2- 10
SAFETY RULES	2- 10
IF PROBLEMS ARE FOUND	2- 10
CLOTHING AND PERSONAL PROTECTIVE ITEMS	2- 10
FIRE EXTINGUISHER AND FIRST AID KIT	2- 10
SAFETY FEATURES	2- 10
KEEP MACHINE CLEAN	2- 11
INSIDE OPERATOR'S COMPARTMENT	2- 11
ALWAYS APPLY LOCK WHEN LEAVING OPERATOR'S SEAT	2- 11
HANDRAILS AND STEPS	2- 12
MOUNTING AND DISMOUNTING	2- 12
CRUSHING OR CUTTING PREVENTION	2- 12
PREVENTION OF BURNS	2- 13
FIRE PREVENTION	2- 13
ACTION IF FIRE OCCURS	2- 14
WINDOW WASHER LIQUID	2- 14
PRECAUTIONS WHEN USING ROPS (Roll Over Protective Structure)	2- 15
PRECAUTIONS FOR ATTACHMENTS, OPTIONS	2- 15
UNAUTHORIZED MODIFICATION	2- 15
SAFETY AT WORKSITE	2- 15
WORKING ON LOOSE GROUND	2- 16
DO NOT GO CLOSE TO HIGH-VOLTAGE CABLES	2- 16
ENSURE GOOD VISIBILITY	2- 16
PRECAUTIONS RELATED TO VENTILATION OF EXHAUST GAS	2- 17
CHECKING SIGNALMAN'S SIGNALS AND SIGNS	2- 17
EMERGENCY ESCAPE FROM OPERATOR'S CAB	2- 17
ASBESTOS DUST HAZARD PREVENTION	2- 17

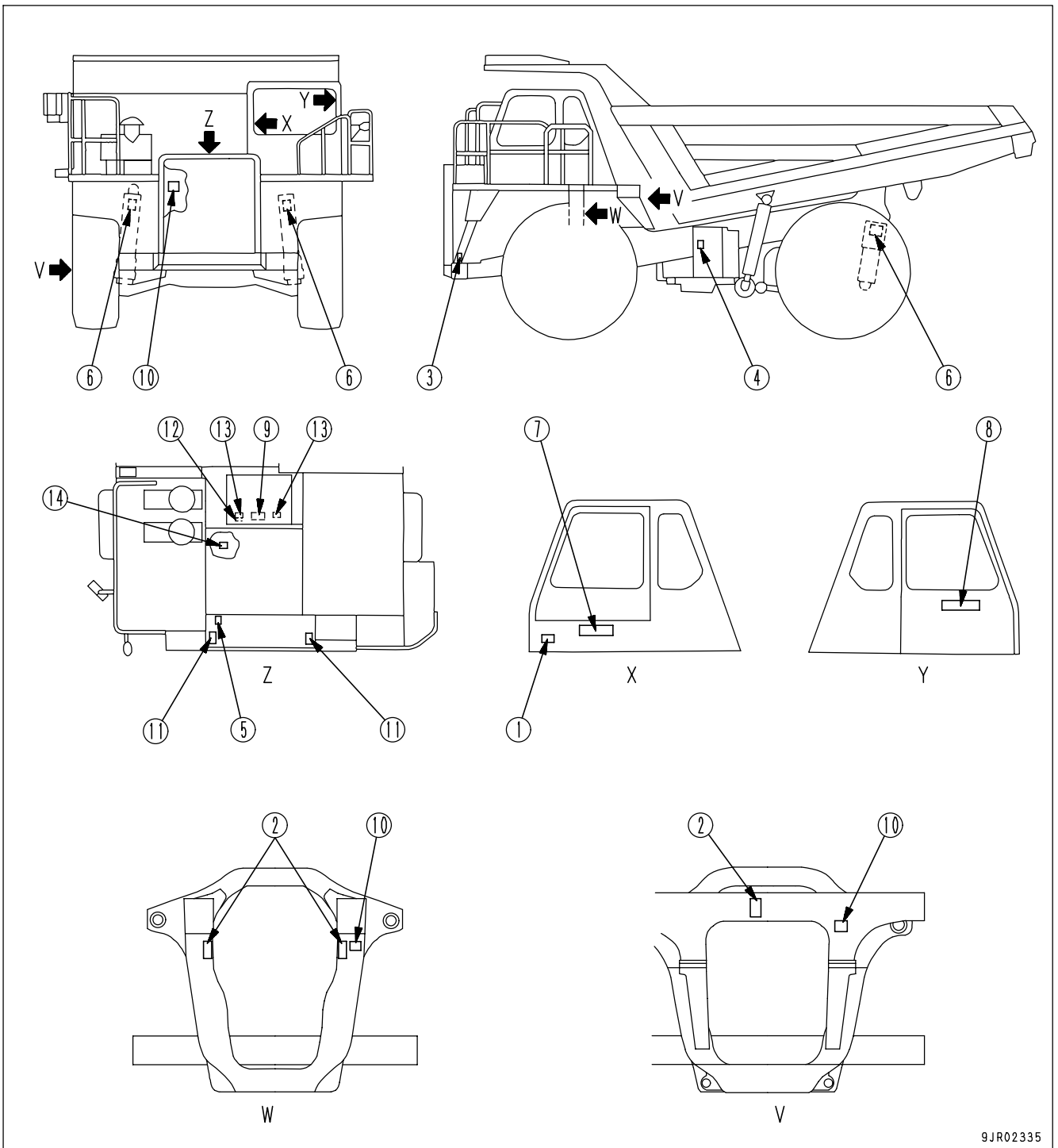
PRECAUTIONS DURING OPERATION	2- 18
STARTING ENGINE	2- 18
CHECKS BEFORE STARTING ENGINE, ADJUST	2- 18
PRECAUTIONS WHEN STARTING	2- 18
PRECAUTIONS IN COLD AREAS	2- 19
OPERATION	2- 20
CHECKS BEFORE STARTING OPERATION	2- 20
PRECAUTIONS WHEN TRAVELING IN FORWARD OR REVERSE	2- 20
PRECAUTIONS WHEN TRAVELING	2- 20
PRECAUTIONS WHEN TRAVELING ON SLOPES	2- 21
PRECAUTIONS WHEN OPERATING DUMP BODY	2- 21
PRECAUTIONS WHEN OPERATING	2- 21
PRECAUTIONS FOR ACCUMULATED SNOW, ICE	2- 21
PARKING MACHINE	2- 22
TRANSPORTATION	2- 23
LOADING AND UNLOADING	2- 23
SHIPPING	2- 23
BATTERY	2- 24
BATTERY HAZARD PREVENTION	2- 24
STARTING WITH BOOSTER CABLES	2- 25
TOWING	2- 26
WHEN TOWING	2- 26
PRECAUTIONS FOR MAINTENANCE	2- 27
WARNING TAG	2- 27
KEEP WORK PLACE CLEAN AND TIDY	2- 27
APPOINT LEADER WHEN WORKING WITH OTHERS	2- 27
STOP ENGINE BEFORE CARRYING OUT INSPECTION AND MAINTENANCE	2- 28
TWO WORKERS FOR MAINTENANCE WHEN ENGINE IS RUNNING	2- 29
PROPER TOOLS	2- 29
HANDLING SUSPENSION CYLINDER, ACCUMULATOR	2- 30
PERSONNEL	2- 30
WORK UNDER THE MACHINE	2- 30
NOISE	2- 30
PRECAUTIONS WHEN USING HAMMER	2- 30
REPAIR WELDING	2- 30
REMOVING BATTERY TERMINAL	2- 31
PRECAUTIONS WITH HIGH-PRESSURE OIL	2- 31
HANDLING HIGH-PRESSURE HOSES, PIPING	2- 32
WASTE MATERIALS	2- 32
MAINTENANCE OF AIR CONDITIONER	2- 32
COMPRESSED AIR	2- 32
PERIODIC REPLACEMENT OF SAFETY-CRITICAL PARTS	2- 32
PRECAUTIONS WITH TIRES	2- 33
HANDLING TIRES	2- 33
PRECAUTIONS WHEN STORING TIRE	2- 33

SAFETY LABELS

The following warning signs and safety labels are used on this machine.

- Be sure that you fully understand the correct position and content of labels.
- To ensure that the content of labels can be read properly, be sure that they are in the correct place and always keep them clean. When cleaning them, do not use organic solvents or gasoline. These may cause the labels to peel off.
- There are also other labels in addition to the warning signs and safety labels. Handle those labels in the same way.
- If the labels are damaged, lost, or cannot be read properly, replace them with new ones. For details of the part numbers for the labels, see this manual or the actual label, and place an order with Komatsu distributor.

POSITION FOR ATTACHING SAFETY LABELS



9JR02335

SAFETY LABELS

(1) Caution about modifying ROPS (09620-30201)
(For North America)

ROLL-OVER PROTECTIVE STRUCTURE (ROPS) CERTIFICATION
 THIS KOMATSU ROPS, MODEL & TYPE No. [] SERIAL No. [] WHEN
 INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION IN-
 STRUCTIONS ON A [] FOR MAXIMUM PRIME MOVER
KOMATSU MASS NOT GREATER THAN [] LBS(kg), IS CERTIFIED TO
 COMPLY WITH THE FOLLOWING REQUIREMENTS: a) ISO 3471 (ROPS) & ISO
 3449 (FOPS) b) SAE J [] & SAE J []

WARNING

- Altering ROPS may weaken it. Consult Komatsu Distributor before altering.
- ROPS may provide less protection if it has been structurally damaged or involved in roll-over.
- Always wear seat belt when moving.

Komatsu Ltd. Japan 2-3-6 Akasaka, Minato-ku, Tokyo, Japan 09620-30201

(1) Caution about modifying ROPS (09620-30200)
(For Australia)

ROLL-OVER PROTECTIVE STRUCTURE (ROPS)
 THE ROLL-OVER PROTECTIVE STRUCTURE OF THIS MACHINE COMPLIES WITH
 THE FOLLOWING STANDARDS OR (RECOMMENDED PRACTICES)
KOMATSU INTERNATIONAL STANDARD: ISO 3471 (ROPS) & ISO 3449 (FOPS)
 AMERICAN STANDARD: SAE J [] & SAE J []


MODEL [] MACHINE [] SERIAL NO. [] MAX []
 MODEL [] MASS []

WARNING

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- ROPS may provide less protection if it has been structurally damaged or involved in roll-over.
- Always wear seat belt when moving.

Komatsu Ltd. Japan 2-3-6 Akasaka, Mimato-ku, Tokyo, Japan 09620-30200


(2) Caution for rotation of front drive shaft (09667-23001)

 **CAUTION**

Keep away from fan and fan-belt
while engine is running.

09667-23001


(3) Caution for rotation of engine fan, fan belt
(without side cover for engine) (09667-23001)

 **CAUTION**

Keep away from fan and fan-belt
while engine is running.

09667-23001

(3) Caution for rotation of engine fan, fan belt
(with side cover for engine) (09667-03001)

 **CAUTION**

While engine is running:

1. Do not open cover.
2. Keep away from fan and fan-belt.

09667-03001

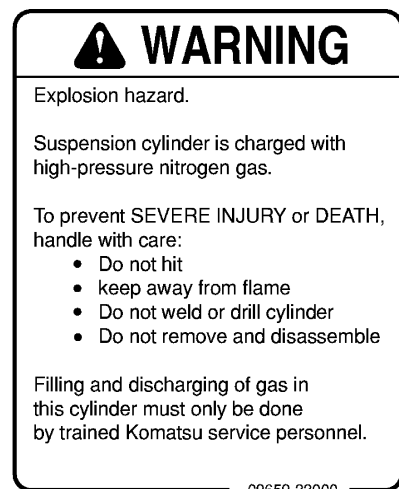
(4) Caution for opening hydraulic tank cap (09653-03001)




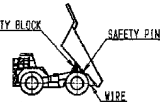
(5) Caution for opening radiator cap (09668-03001)



(6) Warning for handling suspension (09659-33000)



(7) Warnings for electric wire
 Warnings for crush hazard when inspection and maintenance
 (561-93-61733)

<p>⚠ DANGER</p>  <p>HAZARDOUS VOLTAGE HAZARD. SERIOUS INJURY OR DEATH CAN OCCUR IF MACHINE OR ATTACHMENTS ARE NOT KEPT SAFE DISTANCE AWAY FROM ELECTRIC LINES.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>VOLTAGE</th> <th>SAFE DISTANCE</th> </tr> </thead> <tbody> <tr> <td>LOW VOLTAGE</td> <td></td> </tr> <tr> <td>100 V 200 V</td> <td>2 m</td> </tr> <tr> <td>8,000 V</td> <td>2 m</td> </tr> <tr> <td>28,000 V</td> <td>3 m</td> </tr> <tr> <td>60,000 V</td> <td>4 m</td> </tr> <tr> <td>SPECIAL HIGH VOLTAGE</td> <td></td> </tr> <tr> <td>154,000 V</td> <td>5 m</td> </tr> <tr> <td>187,000 V</td> <td>6 m</td> </tr> <tr> <td>275,000 V</td> <td>7 m</td> </tr> <tr> <td>500,000 V</td> <td>11 m</td> </tr> </tbody> </table>	VOLTAGE	SAFE DISTANCE	LOW VOLTAGE		100 V 200 V	2 m	8,000 V	2 m	28,000 V	3 m	60,000 V	4 m	SPECIAL HIGH VOLTAGE		154,000 V	5 m	187,000 V	6 m	275,000 V	7 m	500,000 V	11 m	<p>⚠ DANGER</p> <p>CRUSH HAZARD TO HOLD THE DUMP BODY IN A SAFE RAISED POSITION, ALWAYS DO THE FOLLOWING: -MOVE HOIST CONTROL LEVER TO 'HOLD' AND SAFETY 'LOCK' TO LOCK. -LOCK DUMP BODY WITH SAFETY PIN OR WIRE (WHICHEVER IS INCLUDED); AND -PLACE BLOCK BETWEEN FRAME AND BODY. SEE MANUAL FOR MORE COMPLETE INSTRUCTIONS. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SEVERE INJURY OR DEATH.</p> 	<p>NOTICE</p> <p>1 EMERGENCY STEERING SYSTEM (DAILY CHECK) CHECK THE FUNCTION WITH THE ENGINE STOP ON FLAT GROUND. 1. TURN THE STARTING SWITCH TO THE 'ON' POSITION. 2. APPLY THE EMERGENCY STEERING SWITCH TO THE 'ON' POSITION AND CHECK THE STEERING WHEEL CAN BE OPERATED. 3. TURN THE EMERGENCY STEERING SWITCH TO 'OFF' POSITION. IN CASE OF THE AUTOMATIC EMERGENCY STEERING SYSTEM IF EQUIPPED. 1. TURN THE STARTING SWITCH TO THE 'ON' POSITION. 2. RELEASE THE PARKING BRAKE. THE SYSTEM WILL ACTIVATE WITHIN 1.5 SECONDS. 3. APPLY THE PARKING BRAKE.</p> <p>2 EMERGENCY BRAKE SYSTEM (DAILY CHECK) 1. RAISE THE AIR PRESSURE TO THE MAXIMUM AND APPLY EMERGENCY BRAKE. 2. PLACE GEAR SHIFT LEVER IN THE 'D' POSITION, GRADUALLY INCREASE THE ENGINE SPEED, AND CHECK THAT MACHINE DOES NOT MOVE EVEN WHEN THE ENGINE SPEED REACHES 1900rpm. DO NOT USE EMERGENCY OR RETARDER BRAKE FOR PARKING.</p>	<p>NOTICE</p> <p>WHEN LEAVING OPERATOR SEAT 1. LOWER DUMP BODY. 2. PARK THE MACHINE ON LEVEL GROUND. 3. STOP ENGINE AND APPLY PARKING BRAKE COMPLETELY. BLOCK WHEELS SECURELY BEFORE LEAVING MACHINE. IDLE ENGINE FOR 5 MINUTES BEFORE SHUTTING IT DOWN.</p> <hr/> <p>⚠ WARNING</p> <p>IF THE RETARDER OIL TEMPERATURE WARNING LAMP LIGHTS UP, STOP MACHINE IMMEDIATELY, OR THE BRAKES WILL FAIL BEFORE STARTING UP. ENGINE AT IDLE SPEED (2,000rpm) UNTIL THE LIGHT GOES OUT.</p> <p style="text-align: right; font-size: small;">561-93-61733</p>
VOLTAGE	SAFE DISTANCE																								
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500,000 V	11 m																								

- If the machine comes too close to electric cables, there is danger of electrocution. Always keep a safe distance from electric cables.
- There is danger that the dump body may come down. Before carrying out inspection or maintenance with the dump body raised, always read the Operation and Maintenance Manual and take the correct action.

(8) Caution before starting
 Caution when traveling in reverse
 (569-93-81730)

<p>⚠ WARNING</p> <p>IMPROPER OPERATION AND MAINTENANCE CAN CAUSE SERIOUS INJURY OR DEATH.</p> <p>READ MANUAL AND LABELS BEFORE OPERATION AND MAINTENANCE. FOLLOW INSTRUCTIONS AND WARNINGS IN MANUAL AND IN LABELS ON MACHINE.</p> <p>KEEP MANUAL IN MACHINE CAB NEAR OPERATOR. CONTACT KOMATSU DISTRIBUTOR FOR A REPLACEMENT MANUAL.</p>	<p>⚠ WARNING</p>  <p>TO PREVENT SEVERE INJURY OR DEATH, DO THE FOLLOWING BEFORE MOVING MACHINE OR ITS DUMP BODY. • HONK HORN TO ALERT PEOPLE NEARBY. • BE SURE NO ONE IS ON OR NEAR MACHINE. • USE SPOTTER IF VIEW IS OBSTRUCTED.</p> <p>FOLLOW ABOVE EVEN IF MACHINE IS EQUIPPED WITH BACK-UP ALARM AND MIRRORS.</p>	<p>NOTICE</p> <p>BE SURE TO LOWER DUMP BODY AND KEEP HOIST CONTROL LEVER AT THE FLOAT POSITION DURING TRAVEL.</p>  <p style="text-align: right; font-size: small;">569-93-81730</p>
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(9) Caution when handling battery cable (09808-03000)

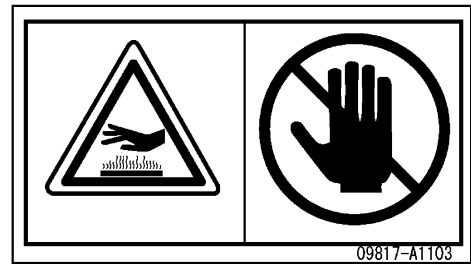
⚠ WARNING

Improper use of booster cables and battery cables can cause an explosion resulting in serious injury or death.

- Follow instructions in manual when using booster cable and battery cables.

09808-03000

(10) Exhaust pipe is hot! (09817-A1103)

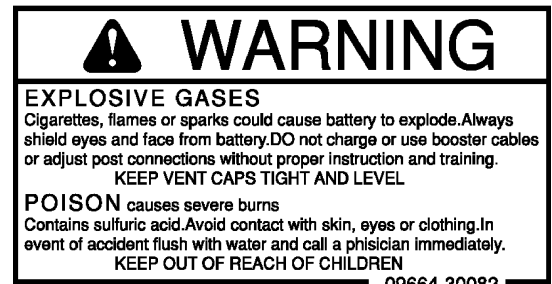


Sign indicates a burn hazard from touching heated parts, such as engine, motor, or muffler during or right after operation. Never touch when hot.

(11) Caution for avoiding falling down (09805-13000)



(12) Caution when handling battery (09664-30082)
(For North America only)



(13) Caution when handling battery
(This plate is stick on the machine by the battery maker.)



(14) Jump start prohibited (09842-A0481)
(This plate is stick on the starting motor.)



Start the engine only after sitting down in the operator's seat. Do not attempt to start the engine by short-circuiting the engine starting circuit. Such an act may cause a serious bodily injury or fire.

GENERAL PRECAUTIONS

SAFETY RULES

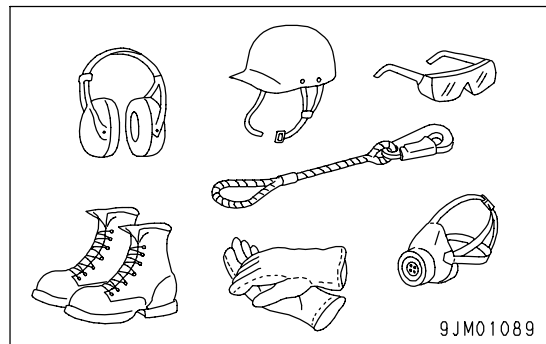
- Only trained and authorized personnel can operate and maintain the machine.
- Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.
- If you are under the influence of alcohol or medication, your ability to safely operate or repair your machine may be severely impaired putting yourself and everyone else on your jobsite in danger.
- When working with another operator or with a person on worksite traffic duty, be sure that all personnel understand all hand signals that are to be used.

IF PROBLEMS ARE FOUND

If you find any problems in the machine during operation or maintenance (noise, vibration, smell, incorrect gauges, smoke, oil leakage, etc., or any abnormal display on the warning devices or monitor), report to the person in charge and have the necessary action taken. Do not operate the machine until the problem has been corrected.

CLOTHING AND PERSONAL PROTECTIVE ITEMS

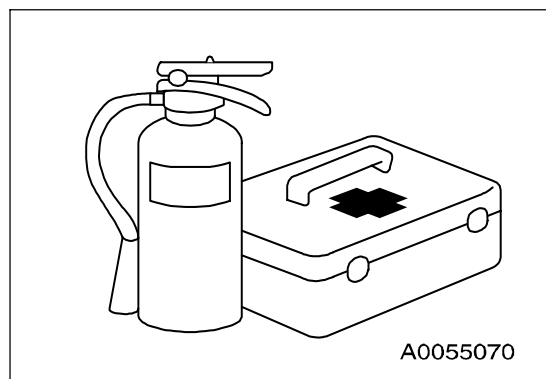
- Do not wear loose clothing and accessories. There is a hazard that they may catch on dump lever or other protruding parts.
- If you have long hair and it hangs out from your hard hat, there is a hazard that it may get caught up in the machine, so tie your hair up and be careful not to let it get caught.
- Always wear a hard hat and safety shoes. If the nature of the work requires it, wear safety glasses, mask, gloves, ear plugs, and safety belt when operating or maintaining the machine.
- Check that all protective equipment functions properly before using it.



FIRE EXTINGUISHER AND FIRST AID KIT

Always follow the precautions below to prepare for action if any injury or fire should occur.

- Be sure that fire extinguishers have been provided and read the labels to ensure that you know how to use them in emergencies.
- Carry out periodic inspection and maintenance to ensure that the fire extinguisher can always be used.
- Provide a first aid kit in the storage point. Carry out periodic checks and add to the contents if necessary.

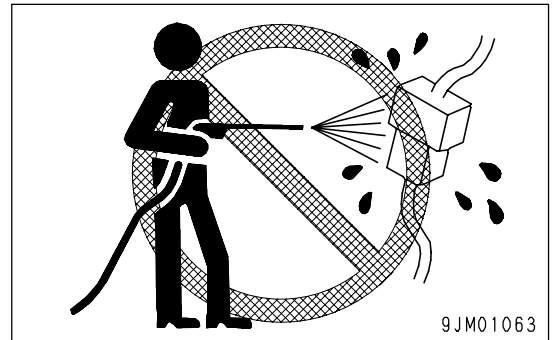


SAFETY FEATURES

- Be sure that all guards and covers are in their proper position. Have guards and covers repaired immediately if they are damaged.
- Understand the method of use of safety features and use them properly.
- Never remove any safety features. Always keep them in good operating condition.

KEEP MACHINE CLEAN

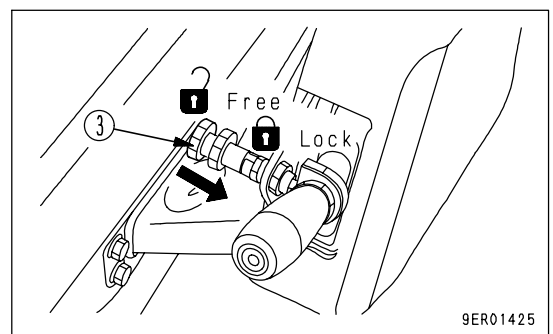
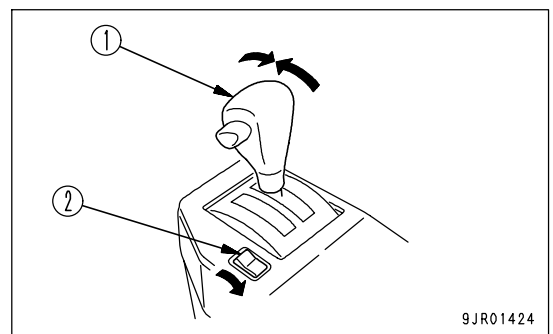
- If water gets into the electrical system, there is a hazard that it will cause malfunctions or misoperation. Do not use water or steam to wash the electrical system (sensors, connectors).
- If inspection and maintenance is carried out when the machine is still dirty with mud or oil, there is a hazard that you will slip and fall, or that dirt or mud will get into your eyes. Always keep the machine clean.

**INSIDE OPERATOR'S COMPARTMENT**

- When entering the operator's compartment, always remove all mud and oil from the soles of your shoes. If you operate the pedal with mud or oil affixed to your shoes, your foot may slip and this may cause a serious accident.
- Do not leave parts or tools lying around the operator's compartment.
- Do not stick suction pads to the window glass. Suction pads act as a lens and may cause fire.
- Do not use cellular telephones inside the operator's compartment when driving or operating the machine.
- Never bring any dangerous objects such as flammable or explosive items into the operator's compartment.

ALWAYS APPLY LOCK WHEN LEAVING OPERATOR'S SEAT

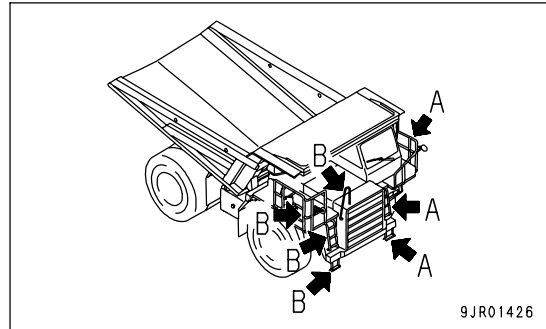
- Before adjusting or standing up from the operator's seat, always set shift lever (1) to the N position and parking brake switch (2) to the PARKING position, then stop the engine.
- If the gear shift lever or dump lever are touched by mistake, there is danger that the machine may suddenly move and cause serious personal injury or damage.
- When leaving the machine, always place shift lever (1) at neutral and set parking brake switch (2) to the PARKING position. Lower the dump body, set the dump lever to the HOLD position, and lock with the safety lock knob (3). Apply all the locks and always remember to take the key with you and keep it in the fixed place.



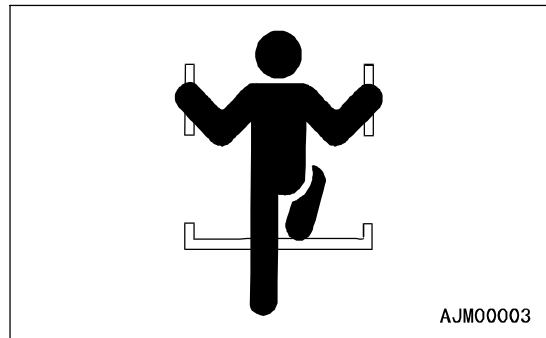
HANDRAILS AND STEPS

To prevent personal injury caused by slipping or falling off the machine, always do as follows.

- Use the handrails and steps marked by arrows in the diagram below when getting on or off the machine.
 - A: For use when getting on or off the operator's seat from the left door
 - B: For use when getting on or off the operator's seat from the engine hood or right door



- To ensure safety, always face the machine and maintain three-point contact (both feet and one hand, or both hands and one foot) with the handrails and steps to ensure that you support yourself.
- Do not grip the dump lever when getting on or off the machine.
- Never climb on the engine hood or covers where there are no non-slip pads.
- Before getting on or off the machine, check the handrails and steps, and if there is any oil, grease, or mud on them, wipe it off immediately. In addition, repair any damage and tighten any loose bolts.
- Do not get on or off the machine while holding tools in your hand.

**MOUNTING AND DISMOUNTING**

- Never jump on or off the machine. Never get on or off a moving machine.
- If the machine starts to move when there is no operator on the machine, do not jump on to the machine and try to stop it.

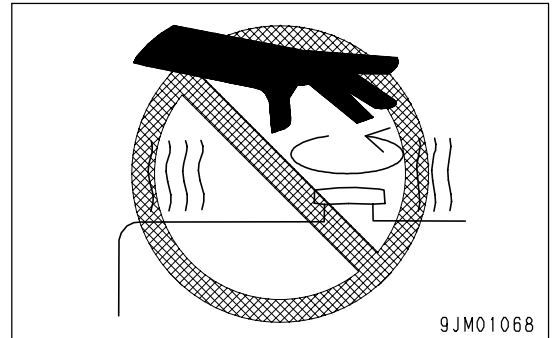
CRUSHING OR CUTTING PREVENTION

- Around the body and front tire housing, the clearance changes according to the movement of the body or the tire. If you get caught, you will be seriously injured. Do not allow anyone close to any rotating portion or any portion that extends and retracts.

PREVENTION OF BURNS

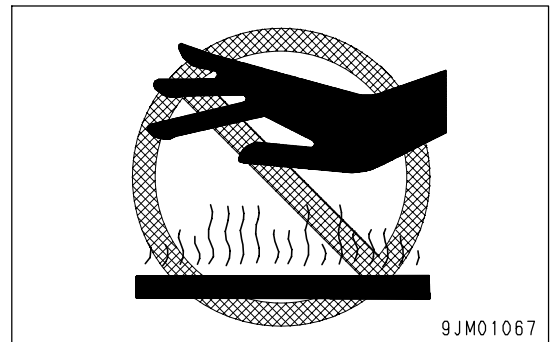
Hot coolant

- To prevent burns from hot water or steam spurting out when checking or draining the coolant, wait for the water to cool to a temperature where it is possible to touch the radiator cap by hand before starting the operation. Even when the coolant has cooled down, loosen the cap slowly to relieve the pressure inside the radiator before removing the cap.



Hot oil

- To prevent burns from hot oil spurting out when checking or draining the oil, wait for the oil to cool to a temperature where it is possible to touch the cap or plug by hand before starting the operation. Even when the oil has cooled down, loosen the cap or plug slowly to relieve the internal pressure before removing the cap or plug.



FIRE PREVENTION

• Fire caused by fuel or oil

Fuel, oil, antifreeze, and window washer liquid are particularly flammable and can be hazardous. To prevent fire, always observe the following:

- Do not smoke or use any flame near fuel or oil.
- Stop the engine before refueling.
- Do not leave the machine while adding fuel or oil.
- Tighten all fuel and oil caps securely.
- Do not spill fuel on overheated surfaces or on parts of the electrical system.
- Use well-ventilated areas for adding or storing oil and fuel.
- Keep oil and fuel in the determined place and do not allow unauthorized persons to enter.
- After adding fuel or oil, wipe up any spilled fuel or oil.
- When carrying out grinding or welding work on the chassis, move any flammable materials to a safe place before starting.
- When washing parts with oil, use a non-flammable oil. Diesel oil and gasoline may catch fire, so do not use them.
- Put greasy rags and other flammable materials into a safe container to maintain safety at the work place.
- Do not weld or use a cutting torch to cut any pipes or tubes that contain flammable liquids.



- **Fire caused by accumulation of flammable material.**

Remove any dry leaves, chips, pieces of paper, dust, or any other flammable materials accumulated or affixed around the engine, exhaust manifold, muffler, or battery, or inside the undercovers.

- **Fire coming from electric wiring**

Short circuits in the electrical system can cause fire.

- Always keep electric wiring connections clean and securely tightened.
- Check the wiring every day for looseness or damage. Tighten any loose connectors or wiring clamps. Repair or replace any damaged wiring.

- **Fire coming from hydraulic line**

Check that all the hose and tube clamps, guards, and cushions are securely fixed in position.

If they are loose, they may vibrate during operation and rub against other parts. This may lead to damage to the hoses, and cause high-pressure oil to spurt out, leading to fire damage or serious injury.

- **Explosion caused by lighting equipment**

- When checking fuel, oil, battery electrolyte, window washer fluid, or coolant, always use lighting with anti-explosion specifications. If such lighting equipment is not used, there is danger of explosion that may cause serious injury.
- When taking the electrical power for the lighting from the machine itself, follow the instructions in this manual.

ACTION IF FIRE OCCURS

If a fire occurs, escape from the machine as follows.

- Turn the start switch OFF to stop the engine.
- Use the handrails and steps to get off the machine.

WINDOW WASHER LIQUID

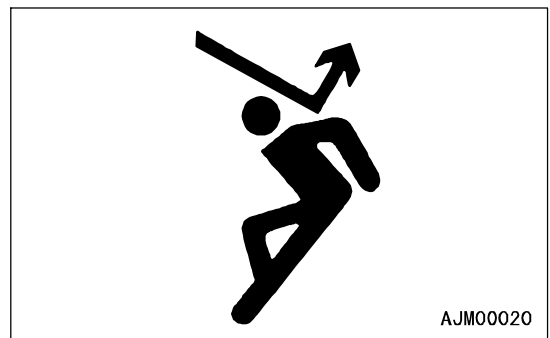
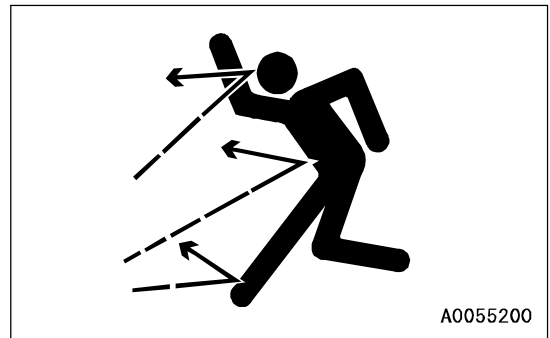
Use an ethyl alcohol base washer liquid.

Methyl alcohol base washer liquid may irritate your eyes, so do not use it.

PRECAUTIONS WHEN USING ROPS (Roll Over Protective Structure)

- ROPS is installed to protect the operator when machine rolls over. When machine rolls over, ROPS supports its weight and absorbs its impact energy.
- If ROPS is modified, its strength may be reduced. When modifying, consult your Komatsu distributor.
- If ROPS is deformed by falling objects or by rolling over, its strength lowers and its design functions cannot be maintained. In this case, be sure to ask your Komatsu distributor about repair method.

Even when the ROPS is installed, if you do not fasten your seat belt securely, it cannot protect you properly. Always fasten your seat belt when operating the machine.

**PRECAUTIONS FOR ATTACHMENTS, OPTIONS**

- When installing optional parts or attachments, there may be problems with safety or legal restrictions. Therefore contact your Komatsu distributor for advice.
- Any injuries, accidents, or product failures resulting from the use of unauthorized attachments or parts will not be the responsibility of Komatsu.
- When installing and using optional attachments, read the instruction manual for the attachment, and the general information related to attachments in this manual.

UNAUTHORIZED MODIFICATION

Any modification made without authorization from Komatsu can create hazards. Before making a modification, consult your Komatsu distributor.

- Komatsu will not be responsible for any injuries, accidents, product failures or other property damages resulting from modifications made without authorization from Komatsu.

SAFETY AT WORKSITE

Before starting operations, thoroughly check the area for any unusual conditions that could be dangerous.

- Check the terrain and condition of the ground at the worksite, and determine the safest method of operation. Do not operate where there is a hazard of landslides or falling rocks.
- Take necessary measures to prevent any unauthorized person from entering the operating area.
- When traveling or operating in shallow water or on soft ground, check the shape and condition of the bedrock, and the depth and speed of flow of the water before starting operations.
- Always design and maintain the roads on the jobsite so that the machines can travel safely.

WORKING ON LOOSE GROUND

- Avoid traveling or operating your machine too close to the edge of cliffs, overhangs, and deep ditches. The ground may be weak in such areas. If the ground should collapse under the weight or vibration of the machine, there is a hazard that the machine may fall or tip over. Remember that the soil after heavy rain or blasting or after earthquakes is weak in these areas.
- When working on embankments or near excavated ditches, there is a hazard that the weight and vibration of the machine will cause the soil to collapse. Before starting operations, take steps to ensure that the ground is safe and to prevent the machine from rolling over or falling.

DO NOT GO CLOSE TO HIGH-VOLTAGE CABLES

Do not travel or operate the machine near electric cables. There is a hazard of electric shock, which may cause serious injury or property damage. On jobsites where the machine may go close to electric cables, always do as follows.

- Before starting work near electric cables, inform the local power company of the work to be performed, and ask them to take the necessary action.
- Even going close to high-voltage cables can cause electric shock, which may cause serious burns or even death. Always maintain a safe distance (see the table on the right) between the machine and the electric cable. Check with the local power company about safe operating procedure before starting operations.
- To prepare for any possible emergencies, wear rubber shoes and gloves. Lay a rubber sheet on top of the seat, and be careful not to touch the chassis with any exposed part of your body.
- Use a signalman to give warning if the machine approaches too close to the electric cables.
- When carrying out operations near high voltage cables, do not let anyone near the machine.
- If the machine should come too close or touch the electric cable, to prevent electric shock, the operator should not leave the operator’s compartment until it has been confirmed that the electricity has been shut off. Also, do not let anyone near the machine.

Voltage of Cables	Safety Distance
100 V - 200 V	Over 2 m (7 ft)
6,600 V	Over 2 m (7 ft)
22,000 V	Over 3 m (10 ft)
66,000 V	Over 4 m (14 ft)
154,000 V	Over 5 m (17 ft)
187,000 V	Over 6 m (20 ft)
275,000 V	Over 7 m (23 ft)
500,000 V	Over 11 m (36 ft)

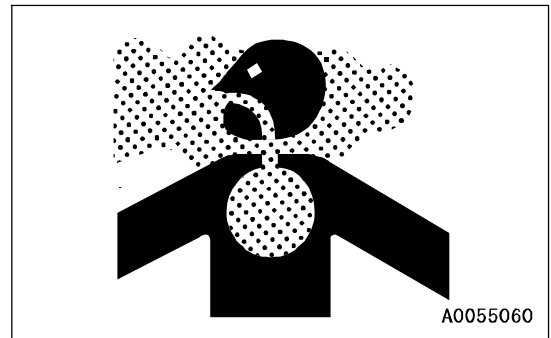
ENSURE GOOD VISIBILITY

- Check for any persons or obstacles in the area around the machine and check the conditions of the jobsite to ensure that operations and travel can be carried out safely. Always do as follows.
 - Position a signalman if there are areas at the rear of the machine where the visibility is not good.
 - When working in dark places, turn on the working lamp and front lamps installed to the machine, and set up additional lighting in the work area if necessary.
 - Stop operations if the visibility is poor, such as in mist, snow, rain, or dust.

PRECAUTIONS RELATED TO VENTILATION OF EXHAUST GAS

Engine exhaust gas includes substances that may harm your health or even kill. Always select a place with good ventilation when starting the engine or operating the machine.

If it is necessary to start the engine or run the machine inside a building or underground, where the ventilation is poor, take steps to remove the exhaust gas and bring in ample fresh air.

**CHECKING SIGNALMAN'S SIGNALS AND SIGNS**

- Set up signs to inform of road shoulders and soft ground. If the visibility is not good, position a signalman if necessary. Operators should pay careful attention to the signs and follow the instructions from the signalman.
- Only one signalman should give signals.
- Make sure that all workers understand the meaning of all signals and signs before starting work.

EMERGENCY ESCAPE FROM OPERATOR'S CAB

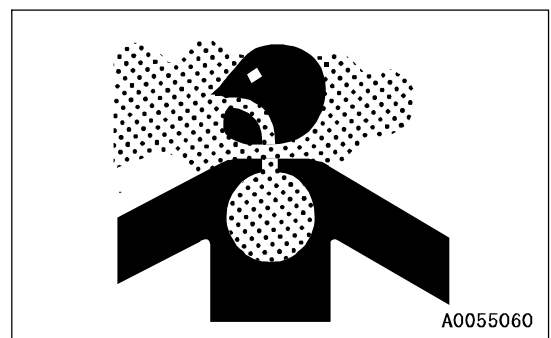
- The cab installed on this machine has doors on the left and right sides. If the door on one side does not open, escape through the door on the other side.

ASBESTOS DUST HAZARD PREVENTION

Asbestos dust in the air can cause lung cancer if it is inhaled. There is danger of inhaling asbestos when working on jobsites handling demolition work or work handling industrial waste. Always observe the following.

- Spray water to keep down the dust when cleaning. Do not use compressed air for cleaning.
- If there is danger that there may be asbestos dust in the air, always operate the machine from an upwind position. All workers should use an approved respirator.
- Do not allow other persons to approach during the operation.
- Always observe the rules and regulations for the work site and environmental standards.

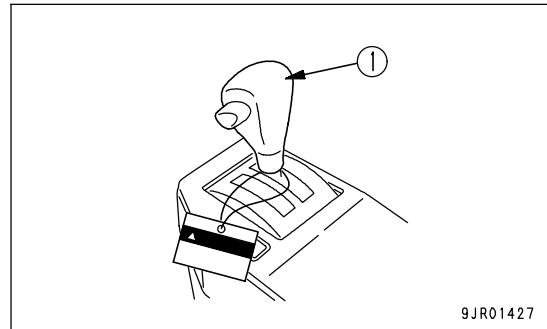
This machine does not use asbestos, but there is a danger that imitation parts may contain asbestos, so always use genuine Komatsu parts.



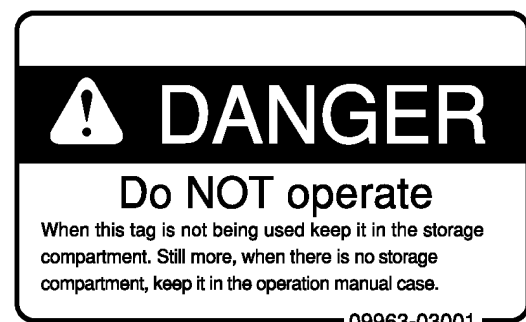
PRECAUTIONS DURING OPERATION

STARTING ENGINE

If there is a warning tag hanging from gear shift lever (1), do not start the engine or touch the levers.



9JR01427



CHECKS BEFORE STARTING ENGINE, ADJUST

Carry out the following checks before starting the engine at the beginning of the day's work.

- Remove all dirt from the surface of the window glass to ensure a good view.
- Remove all dirt from the surface of the lens of the front lamps, working lamps, and rear combination lamp, and check that they light up correctly.
- Check the coolant level, fuel level, and oil level in engine oil pan, check for clogging of the air cleaner, and check for damage to the electric wiring.
- Check that there is no mud or dust accumulated around the movable parts of the accelerator pedal or brake pedal, and check that the pedals work properly.
- Adjust the operator's seat to a position where it is easy to carry out operations, and check that there is no damage or wear to the seat belt or mounting clamps.
- Check that the gauges and instruments work properly, check the angle of the mirror, and check that the gearshift lever is at neutral and the dump lever is at HOLD.
- Before starting the engine, make sure that the safety lock knob is in the LOCK position.
- Adjust the mirrors so that the rear of the machine can be seen clearly from the operator's seat. Refer to "WALK-AROUND CHECK (PAGE 3-68)".
- Check that there are no persons or obstacles above, below, or in the area around the machine.
- Check that the parking brake switch is in the PARKING position.

PRECAUTIONS WHEN STARTING

- Start and operate the machine only while seated.
- Do not attempt to start the engine by short-circuiting the engine starting circuit. Such an act may cause a serious bodily injury or fire.
- When starting the engine, sound the horn as a warning.
- If another person is allowed on the machine, that person may sit only in the assistant's seat.
- For machines equipped with a backup alarm, check that the warning device works properly.

PRECAUTIONS IN COLD AREAS

- Carry out the warming-up operation thoroughly. If the machine is not thoroughly warmed up before the gear shift lever or dump lever are operated, the reaction of the machine will be slow or may change suddenly, and this may cause an accident.
- If the battery electrolyte is frozen, do not charge the battery or start the engine with a different power source. There is a hazard that this will ignite the battery and cause the battery to explode. Before charging or starting the engine with a different power source, melt the battery electrolyte and check that there is no leakage of electrolyte before starting.

OPERATION

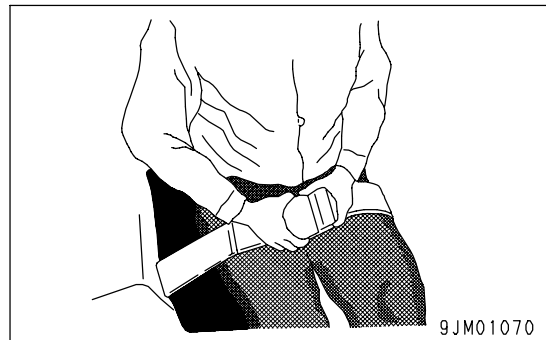
CHECKS BEFORE STARTING OPERATION

When carrying out the checks, move the machine to a wide area where there are no obstructions, and operate slowly. Do not allow anyone near the machine.

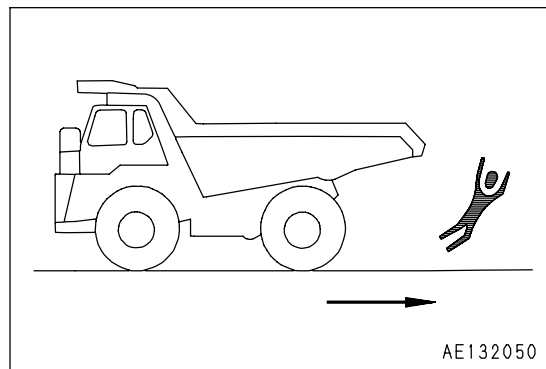
- Always fasten your seat belt.
- Check the operation of the steering, travel, and brake systems.
- Check for any problem in the sound of the machine, vibration, heat, smell, or gauges; check also that there is no leakage of oil or fuel.
- If any problem is found, carry out repairs immediately.

PRECAUTIONS WHEN TRAVELING IN FORWARD OR REVERSE

- Before travelling, check again that there is no one in the surrounding area, and that there are no obstacles.
- Before travelling, sound the horn to warn people in the area.
- Always operate the machine only when seated.
- If another person is allowed on the machine, that person may sit only in the assistant's seat.
- Check that the backup alarm (backup warning buzzer) works properly.
- Always close the door and the window of the operator's compartment and check that the door lock is applied.



Always be sure to carry out the above precautions even when the machine is equipped with mirrors.



PRECAUTIONS WHEN TRAVELING

- Do not load the dump body above the maximum payload. The brakes will lose their effect.
- Never turn the starting switch to the OFF position. It is dangerous if the engine stops when the machine is traveling, because the steering becomes heavy.
- Lower the dump body, setting the dump lever at FLOAT position, then travel.
- When traveling on rough ground, travel at low speed, and avoid sudden changes in direction.
- When traveling or carrying out operations, always keep a safe distance from people, structures, or other machines to avoid coming into contact with them.
- When passing over bridges or structures, check first that the structure is strong enough to support the weight of the machine.
- When operating in tunnels, inside buildings, or under bridges or electric wires, or other places where the height is limited, operate slowly and be extremely careful not to let the machine or dump body contact anything.
- Continuous long time traveling at high speed may cause tires to heat up, abnormally increasing the inflation pressure inside the tires, and to blow up. The explosion of the tire is very destructive, and it can lead to serious injury or death.
- Contact with your Komatsu distributor before doing long continuous traveling.

PRECAUTIONS WHEN TRAVELING ON SLOPES

To prevent the machine from tipping over or slipping to the side, always do as follows.

- When traveling downhill, use the retarder brake to reduce speed. Do not turn the steering wheel suddenly.
- Travel on grass, fallen leaves, or wet steel plates with low speed. Even with slight slopes there is a hazard that the machine may slip.
- If the engine should stop on a slope, immediately depress the emergency brake pedal fully and apply the parking brake also to stop the machine.
- Do not shift gear while traveling downhill or travel downhill with the transmission in neutral.
It is dangerous if the engine has no braking effect. Always set the transmission to a lower gear before starting to travel downhill.

PRECAUTIONS WHEN OPERATING DUMP BODY

- Before starting the dumping operation, check to be sure there is no person or object behind the machine.
- Stop the machine in the correct position, and check again that there is no person or object behind the machine. Give the determined signal, then slowly operate the dump body.
If necessary, use blocks for the wheels or position a flagman.
- Do not carry out dumping operations on slopes. The machine stability will become poor and there is the danger that it could tip over.
- Do not travel with the body raised.
- Do not leave or return to the operator's seat during loading work.

PRECAUTIONS WHEN OPERATING

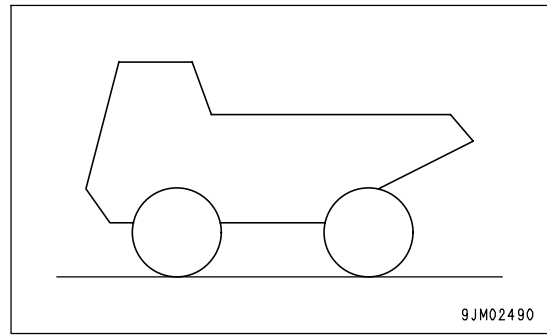
- When using the machine, do not exceed the performance or maximum load specified for the machine structure.
- When operating in tunnels, or under bridges or electric wires, or in other places where the height is limited, operate slowly and be extremely careful not to let the dump body contact anything.
- To prevent accidents caused by hitting other objects, always operate the machine at a speed which is safe for operation, particular in confined spaces, indoors, and in places where there are other machines.

PRECAUTIONS FOR ACCUMULATED SNOW, ICE

- Snow-covered or frozen surfaces are slippery, so be extremely careful when traveling or operating the machine, and do not operate the levers suddenly. Even a slight slope may cause the machine to slip, so be particularly careful when working on slopes.
- With frozen ground surfaces, the ground becomes soft when the temperature rises, and this may cause the machine to tip over.
- If the machine enters deep snow, there is a hazard that it may tip over or become buried in the snow. Be careful not to leave the road shoulder or to get trapped in a snow drift.
- When traveling on snow-covered roads, always fit tire chains.
- When traveling on snow-covered roads, never use the foot brake to make sudden stops. Shift down to use the engine brake and carry out double braking (depress the brake pedal several times) to stop the machine.
- When the loaded materials in the dump body are frozen, do not dump. There is a danger that the machine could tip over.

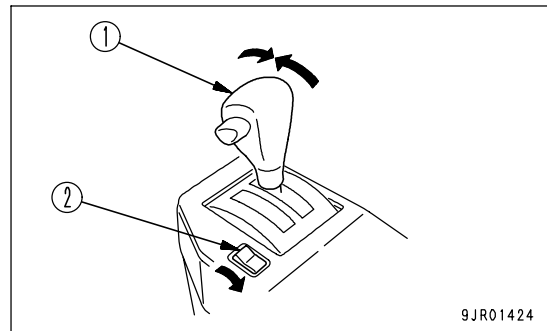
PARKING MACHINE

- Park the machine on firm, level ground.
- Select a place where there is no hazard of falling rocks or landslides, or of flooding if the land is low.

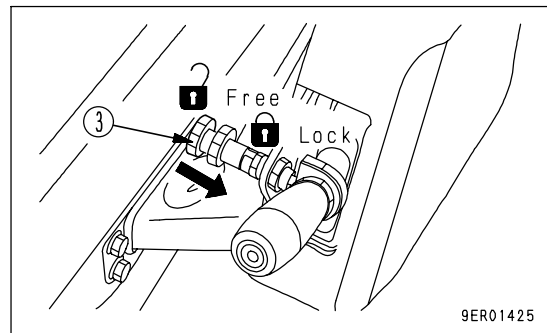


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- When leaving the machine, always place shift lever (1) at neutral and set parking brake switch (2) to the PARKING position. Lower the dump body, set the dump lever to the HOLD position, lock with the safety lock knob (3), then stop the engine.
- Always close the operator's cab door, and use the key to lock all the equipment in order to prevent any unauthorized person from moving the machine. Always remove the key, take it with you, and leave it in the specified place.

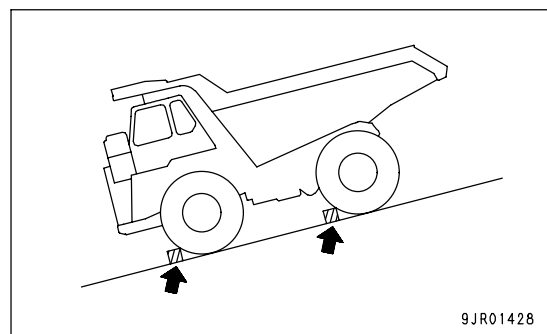


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- If it is necessary to park the machine on a slope, set blocks under the wheels to prevent the machine from moving.



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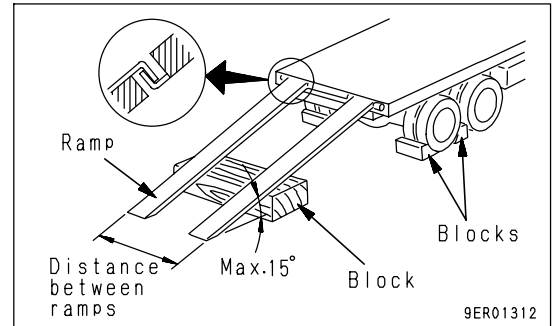
TRANSPORTATION

This machine must be disassembled for transportation. When transporting the machine, please consult your Komatsu distributor.

LOADING AND UNLOADING

When loading or unloading the machine, mistaken operation may bring the hazard of the machine tipping over or falling, so particular care is necessary. Always do as follows.

- Perform loading and unloading on firm, level ground only. Maintain a safe distance from the edge of the road or cliff.
- Always use ramps of adequate strength. Be sure that the ramps are wide, long, and thick enough to provide a safe loading slope. Take suitable steps to prevent the ramps from moving out of position or coming off.
- Be sure the ramp surface is clean and free of grease, oil, ice and loose materials. Remove dirt from machine-tracks. On a rainy day, in particular, be extremely careful since the ramp surface is slippery.
- Run the engine at low speed, drive the machine at low speed, and operate slowly.
- Never correct your steering on the ramps. If necessary, drive off the ramps, correct the direction, then enter the ramps again.
- When loading or unloading to an embankment or platform, make sure that it has suitable width, strength, and grade.
- After loading the machine, always lock the door. There is danger that the door may open during transportation. For details, see "TRANSPORTATION (PAGE 3-117)".



SHIPPING

When shipping the machine on a trailer, do as follows.

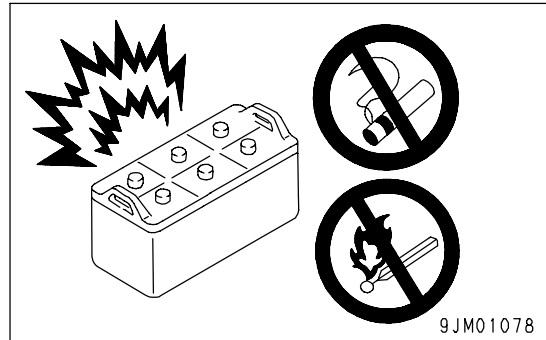
- The weight, transportation height, and overall length of the machine differ according to the attachment, so be sure to confirm the dimensions.
- When passing over bridges or structures on private land, check first that the structure is strong enough to support the weight of the machine. When traveling on public roads, check first with the relevant authorities and follow their instructions.
- For details of the transportation procedure, see "TRANSPORTATION (PAGE 3-117)" in the Operation Section.

BATTERY

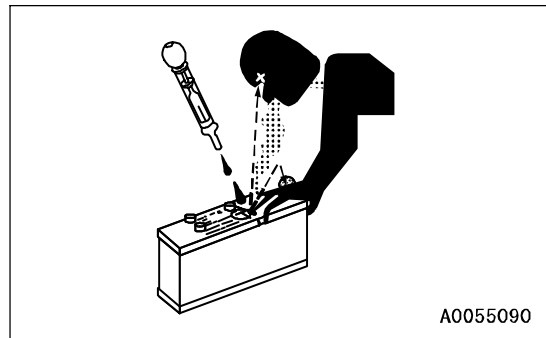
BATTERY HAZARD PREVENTION

Battery electrolyte contains sulphuric acid, and batteries generate flammable hydrogen gas, which may explode. Mistaken handling can lead to serious injury or fire. For this reason, always observe the following precautions.

- Do not use or charge the battery if the battery electrolyte level is below the LOWER LEVEL line. This may cause an explosion. Check the battery electrolyte level periodically and add distilled water to bring the electrolyte level to the UPPER LEVEL line.
- When working with batteries, always wear safety glasses and rubber gloves.
- Never smoke or use any flame near the battery.



- If you spill acid on your clothes or skin, immediately flush the area with large amount of water.
- If acid gets into your eyes, flush them immediately with large amount of water and seek medical attention.



- Before working with batteries, turn the starting switch to the OFF position.

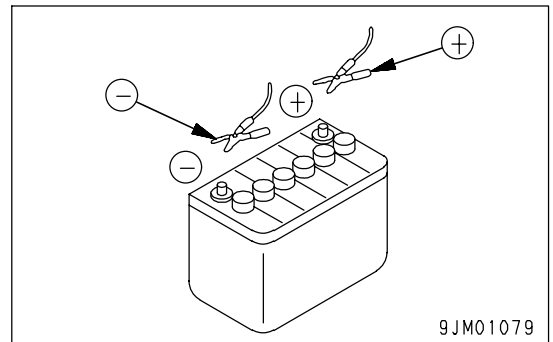
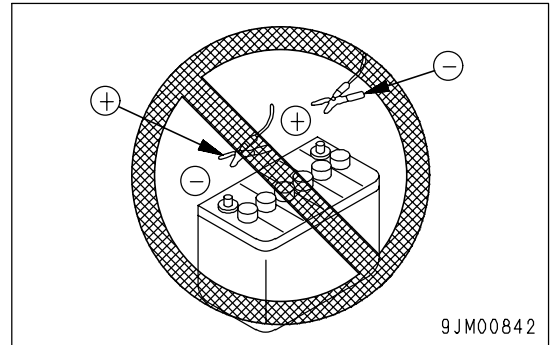
As there is a hazard that sparks will be generated, always do as follows.

- Do not let tools or other metal objects make any contact between the battery terminals. Do not leave tools or other metal objects lying around near the battery.
- Always disconnect the negative (-) terminal (ground side) first when removing the battery; when installing the battery, connect the positive (+) terminal first, and connect the ground last. Tighten the battery terminals securely.
- Flammable hydrogen gas is generated when the battery is charged, so remove the battery from the chassis, take it to a well-ventilated place, and remove the battery caps before charging it.
- Tighten the battery caps securely.
- Install the battery securely to the determined place.

STARTING WITH BOOSTER CABLES

If any mistake is made in the method of connecting the booster cables, it may cause the battery to explode, so always do as follows.

- When starting with a booster cable, carry out the starting operation with two workers (one worker sitting in the operator's seat and the other working with the battery).
- When starting from another machine, do not allow the two machines to touch.
- When connecting the booster cables, turn the starting switch OFF position for both the normal machine and problem machine. There is a hazard that the machine will move when the power is connected.
- Be sure to connect the positive (+) cable first when installing the booster cables. Disconnect the negative (-) cable (ground side) first when removing them.
- When removing the booster cables, be careful not to let the booster cable clips touch each other or to let the clips touch the machine.
- Always wear safety glasses and rubber gloves when starting the engine with booster cables.
- When connecting a normal machine to a problem machine with booster cables, always use a normal machine with the same battery voltage as the problem machine.
- For details of the starting procedure when using booster cables, see "STARTING ENGINE WITH BOOSTER CABLE (PAGE 3-131)" in the OPERATION section.



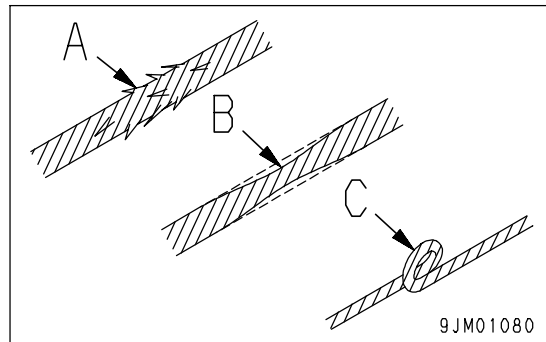
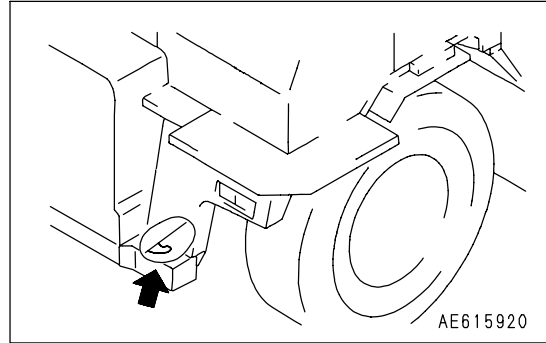
TOWING

WHEN TOWING

When towing or being towed, mistakes in the method of selecting and inspecting the wire rope or drawbar, or in the method of towing may lead to serious personal injury.

For details of the procedure for towing, see the "METHOD OF TOWING MACHINE (PAGE 3-125)"

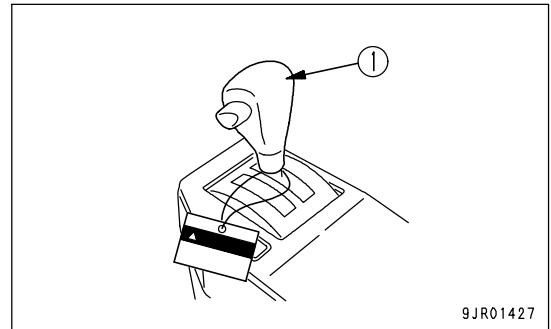
- Always confirm that the wire rope or drawbar used for towing has ample strength for the weight of the machine being towed.
- Never use a wire rope which has cut strands (A), reduced diameter (B), or kinks (C). There is danger that the rope may break during the towing operation.
- Always wear leather gloves when handling wire rope.
- Never tow a machine on a slope.
- During the towing operation, never stand between the towing machine and the machine being towed.



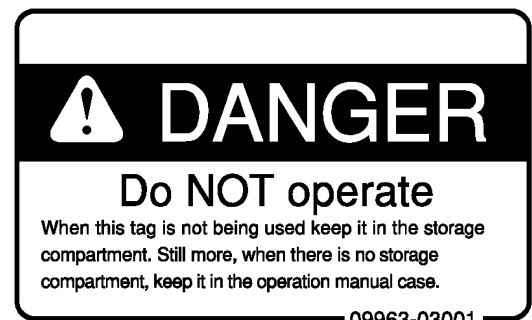
PRECAUTIONS FOR MAINTENANCE

WARNING TAG

- Attach the DO NOT OPERATE warning tag to gear shift lever (1) in the operator's cab during the inspection and maintenance. Attach additional warning tags around the machine if necessary. Warning tag Part No. 09963-03001
Keep the warning tag in the tool box when it is not used. If the tool box is unavailable, keep it in the case for operation manual.
- If any person other than the serviceman starts the engine, or touches or operates the gear shift lever or dump lever while the serviceman is carrying out service or maintenance of the machine, it may lead to serious injury.



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KEEP WORK PLACE CLEAN AND TIDY

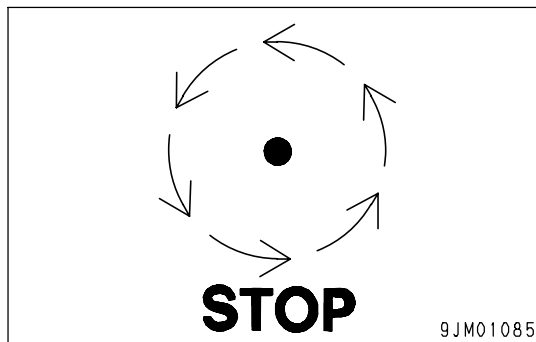
- Do not leave hammers or other tools lying around in the work place. Wipe up all grease, oil, or other substances that will cause you to slip. Always keep the work place clean and tidy to enable you to carry out operations safely. If the work place is not kept clean and tidy, there is the danger that you will trip, slip, or fall over and injure yourself.

APPOINT LEADER WHEN WORKING WITH OTHERS

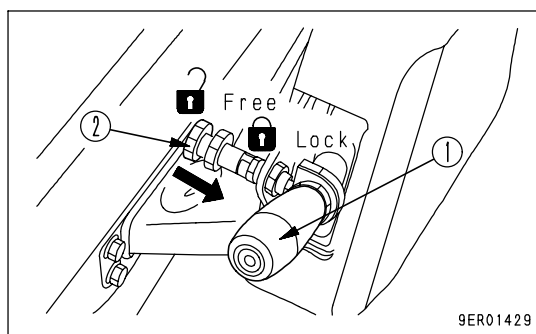
- When repairing the machine or when removing and installing the attachment, appoint a leader and follow his instructions during the operation.
When working with others, misunderstandings between workers can lead to serious accidents.

STOP ENGINE BEFORE CARRYING OUT INSPECTION AND MAINTENANCE

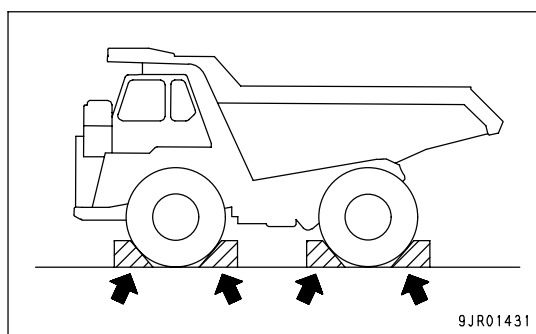
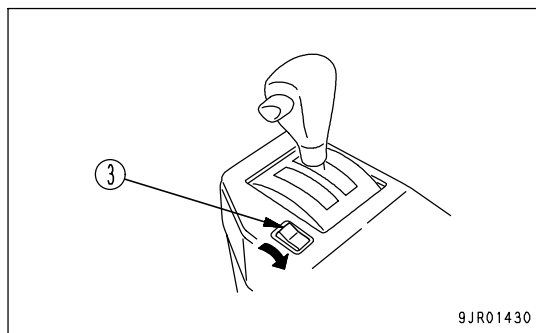
- Stop the machine on firm, level ground.
- Select a place where there is no hazard of falling rocks or landslides, or of flooding if the land is low.



- Lower the dump body, set dump lever (1) to the HOLD position, lock with safety lock knob (2), then stop the engine.



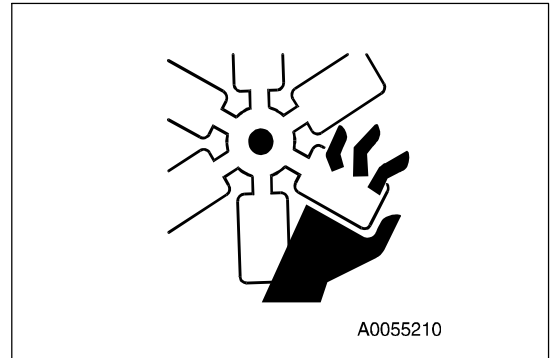
- Set parking brake switch (3) to the PARKING position and put blocks under the tires to prevent the machine from moving.



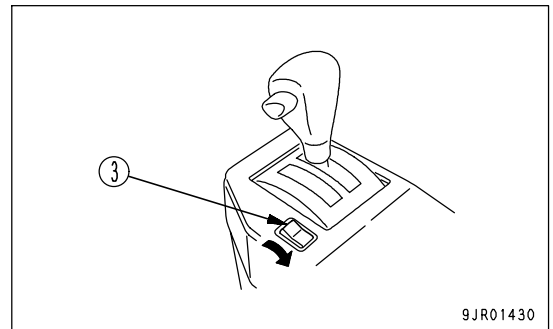
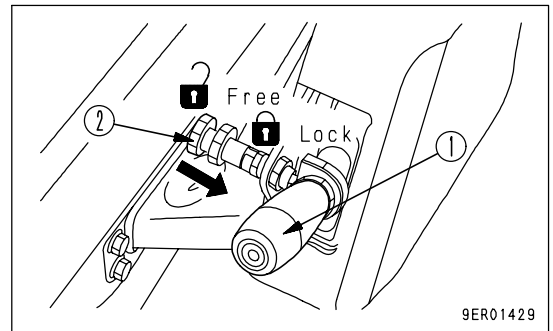
TWO WORKERS FOR MAINTENANCE WHEN ENGINE IS RUNNING

To prevent injury, do not carry out maintenance with the engine running. If maintenance must be carried out with the engine running, carry out the operation with at least two workers and do as follows.

- One worker must always sit in the operator's seat and be ready to stop the engine at any time. All workers must maintain contact with the other workers.



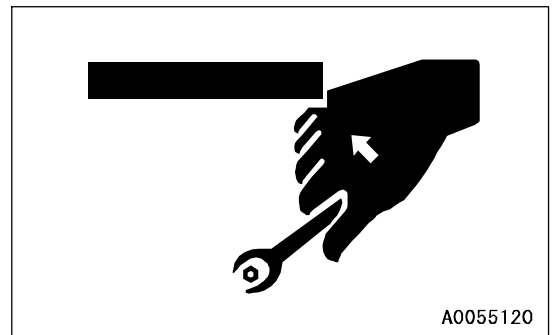
- Set dump lever (1) to the HOLD position, lock with safety lock knob (2), then set parking brake switch (3) to the PARKING position.



- When carrying out operations near the fan, fan belt, or other rotating parts, there is a hazard of being caught in the parts, so be careful not to come close.
- Do not touch the steering wheel, gearshift lever, or dump lever. If the steering wheel, gearshift lever, or dump lever must be operated, always give a signal to the other workers to warn them to move to a safe place.
- Never drop or insert tools or other objects into the fan or fan belt. Parts may break or be sent flying.

PROPER TOOLS

Use only tools suited to the task and be sure to use the tools correctly. Using damaged, low quality, faulty, makeshift tools or improper use of the tools could cause serious personal injury.



HANDLING SUSPENSION CYLINDER, ACCUMULATOR

The suspension cylinders and accumulator are charged with high-pressure nitrogen gas. If any mistake is made in handling, it may cause serious personal injury. To prevent this, always follow the procedure below.

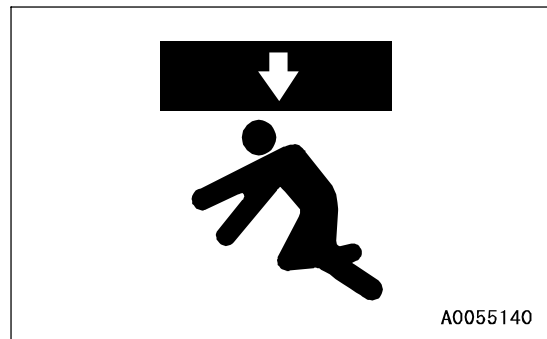
- Do not remove or disassemble the cylinder.
- Do not bring it near flame or dispose of it in fire.
- Do not make holes in it, weld it, or use a cutting torch.
- Do not bear any shock by hammering, rolling or similar activity.
- Ask for your Komatsu distributor when sealing gas into the cylinder or releasing gas from it.

PERSONNEL

Only authorized personnel can service and repair the machine. Do not allow unauthorized personnel into the area. If necessary, employ an observer.

WORK UNDER THE MACHINE

- If it is necessary to go under the machine when it is raised in order to carry out service or maintenance, support the machine securely with blocks and stands strong enough to support the weight of the machine.
- When carrying out inspection of the machine with the dump body raised, always set the dump lever to the HOLD position, lock with the safety lock knob, then use the safety pin.
For details of using the safety pin, see "SAFETY PIN (PAGE 3-44)".



NOISE

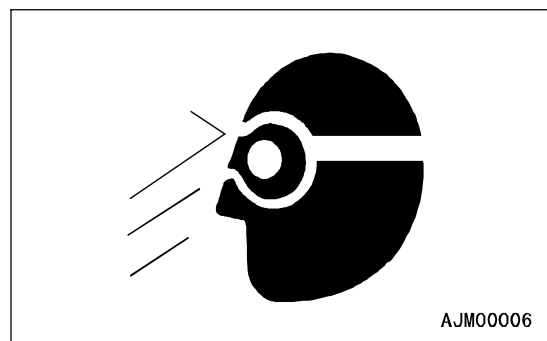
When carrying out maintenance of the engine and you are exposed to noise for long periods of time, wear ear covers or ear plugs while working.

If the noise from the machine is too loud, it may cause temporary or permanent hearing problems.

PRECAUTIONS WHEN USING HAMMER

When using a hammer, pins may fly out or metal particles may be scattered. This may lead to serious injury. Always do as follows.

- If hard metal parts such as pins, and bearings are hit with a hammer, there is danger that small pieces will fly off; this may lead to serious injury. Wear protective glasses, hard hat, and other protective equipment.
- If pins are hit with a hammer, there is a hazard that the metal particles may fly out and injure people in the surrounding area. Always make sure that no-one is in the surrounding area before using the hammer.
- There is a hazard that the pin hit with strong force may fly out and injure people in the surrounding area.



REPAIR WELDING

Welding operations must always be carried out by a qualified welder and in a place equipped with proper equipment. There is a hazard of gas, fire, or electrocution when carrying out welding, so never allow any unqualified personnel to carry out welding.

REMOVING BATTERY TERMINAL

When repairing the electrical system or when carrying out electrical welding, remove the negative (-) terminal of the battery to prevent the flow of current.

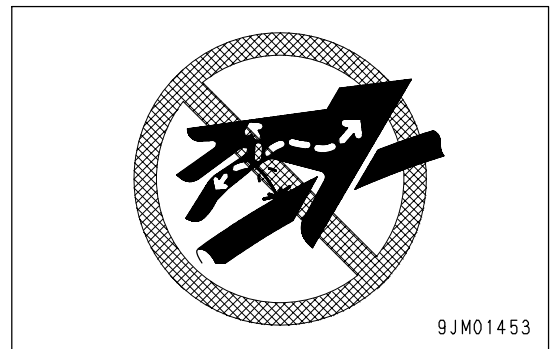
PRECAUTIONS WITH HIGH-PRESSURE OIL

The hydraulic system is always under internal pressure. When inspecting or replacing piping or hoses, always check that the pressure in the hydraulic circuit has been released. If the circuit is still under pressure, it will lead to serious injury, so always do as follows.

- For details of the method of releasing the pressure: see the section on "INSPECTION AND ADJUSTMENT". Do not carry out any inspection or replacement operation before the pressure has been completely removed.
- If there is any leakage from the piping or hoses, the surrounding area will be wet, so check for cracks in the piping and hoses and for swelling in the hoses.

When carry out inspection, wear safety glasses and leather gloves.

- There is a hazard that high-pressure oil leaking from small holes may penetrate your skin or cause blindness if it contacts your eyes directly. If you are hit by a jet of high-pressure oil and suffer injury to your skin or eyes, wash the place with clean water, and consult a doctor immediately for medical attention.



HANDLING HIGH-PRESSURE HOSES, PIPING

- If oil or fuel leaks from high-pressure hoses or piping, it may cause fire or defective operation, which may lead to serious injury. If any loose bolts are found, stop work and tighten to the specified torque. If any damaged hoses are found, stop operations immediately and contact your Komatsu distributor.

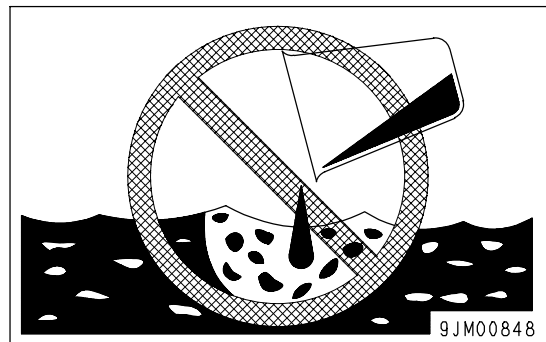
Replace the hose if any of the following problems are found.

- Damaged or leaking hydraulic fitting.
- Frayed or cut covering or exposed reinforcement wire layer.
- Covering swollen in places.
- Twisted or crushed movable portion.
- Foreign material embedded in covering.

WASTE MATERIALS

To prevent pollution, pay careful attention to the method of disposing of waste materials.

- Always put oil drained from your machine in containers. Never drain oil directly onto the ground or dump into the sewage system, rivers, the sea, or lakes.
- Obey appropriate laws and regulations when disposing of harmful objects such as oil, fuel, coolant, solvent, filters, and batteries.

**MAINTENANCE OF AIR CONDITIONER**

If air conditioner refrigerant gets into your eyes, it may cause blindness; if it touches your skin, it may cause frostbite. Never touch refrigerant.

COMPRESSED AIR

- When carrying out cleaning with compressed air, there is a hazard of serious injury caused by flying particles.
- When using compressed air to clean elements or the radiator, always wear safety glasses, dust mask, gloves, and other protective equipment.

PERIODIC REPLACEMENT OF SAFETY-CRITICAL PARTS

- In order for the machine to be operated safely for a long time, it is necessary to add oil and to carry out service and maintenance at periodic intervals. In order to further increase safety, components with a strong relationship to safety, such as hoses and seat belts, must be replaced at periodic intervals.

Replacement of safety-critical parts: See "PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS (PAGE 4-15)".

- The material of these components naturally changes over time, and repeated use causes deterioration, wear, and fatigue. As a result, there is a hazard that these components may fail and cause serious injury or death. It is difficult to judge the remaining life of these components from external inspection or the feeling when operating, so always replace them at the specified interval.
- Replace or repair safety-critical parts if any defect is found, even when they have not reached the time specified interval.

PRECAUTIONS WITH TIRES

HANDLING TIRES

If tires or rims are handled mistakenly, there is danger that the tire may explode or be damaged, or that the rim may fly off and cause serious injury or death.

To maintain safety, always do as follows.

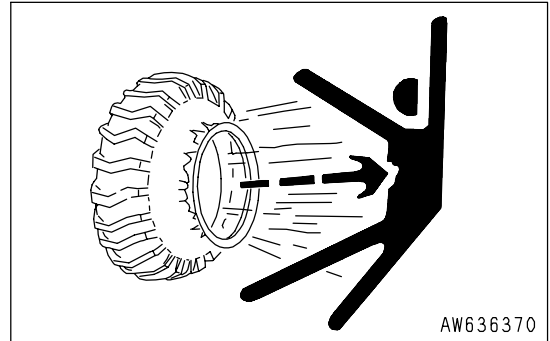
- Maintenance, disassembly, repair, and assembly of the tires and rims requires special equipment and special technology, so always ask your Komatsu distributor to carry out these operations.
- Use only the specified tires and inflate them to the specified pressure.

Suitable inflation pressure: see "SELECTION AND INSPECTION OF TIRES (PAGE 4-36)".

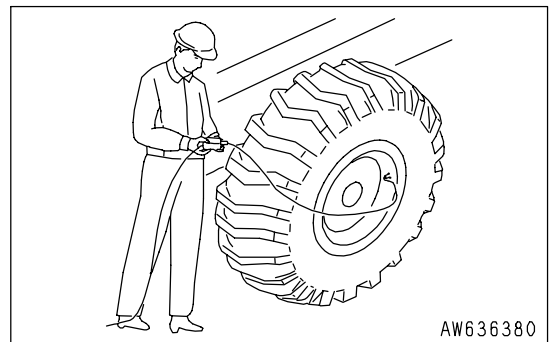
- When pumping up the tires, check that no other person is standing near the tire, and install an air chuck with a clip that can be secured to the air valve.

To prevent the tire inflation pressure from becoming too high, measure the pressure from time to time with an air gauge while pumping up the tire.

- If the tire pressure goes down abnormally or the rim parts do not fit the tire, there is a problem with the tire or rim parts. Always contact your Komatsu distributor for repairs.
- If the rim parts are not fitted properly when the tire is being pumped up, there is danger that the rim parts may fly off, so set up a protective fence around the tire, and do not stand directly in front of the rim. Stand beside the tread when pumping up the tire.
- Do not adjust the tire inflation pressure immediately after traveling at high speed or carrying out operations under heavy load.
- Never carry out welding or light a fire near the tire.



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PRECAUTIONS WHEN STORING TIRE

Tires for construction equipment are extremely heavy, so trying to hold the tire may lead to serious injury.

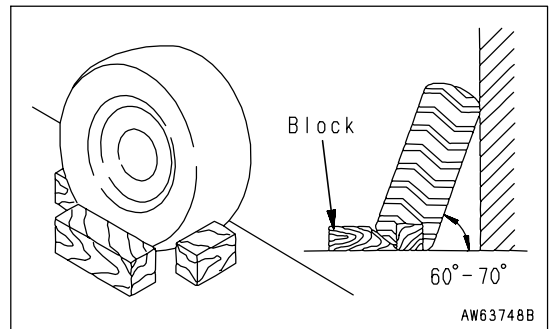
- As a basic rule, store the tires in a warehouse which unauthorized persons cannot enter.

If the tires must be stored outside, always erect a fence and put up "No Entry" signs.

- Stand the tire on level ground, and block it securely so that it cannot roll or fall over if any person should touch it.

Do not lay the tire on its side. This will deform the tire and cause it to deteriorate.

- If the tire should fall over, do not attempt to stop it. Get out of the way quickly.



AW63748B

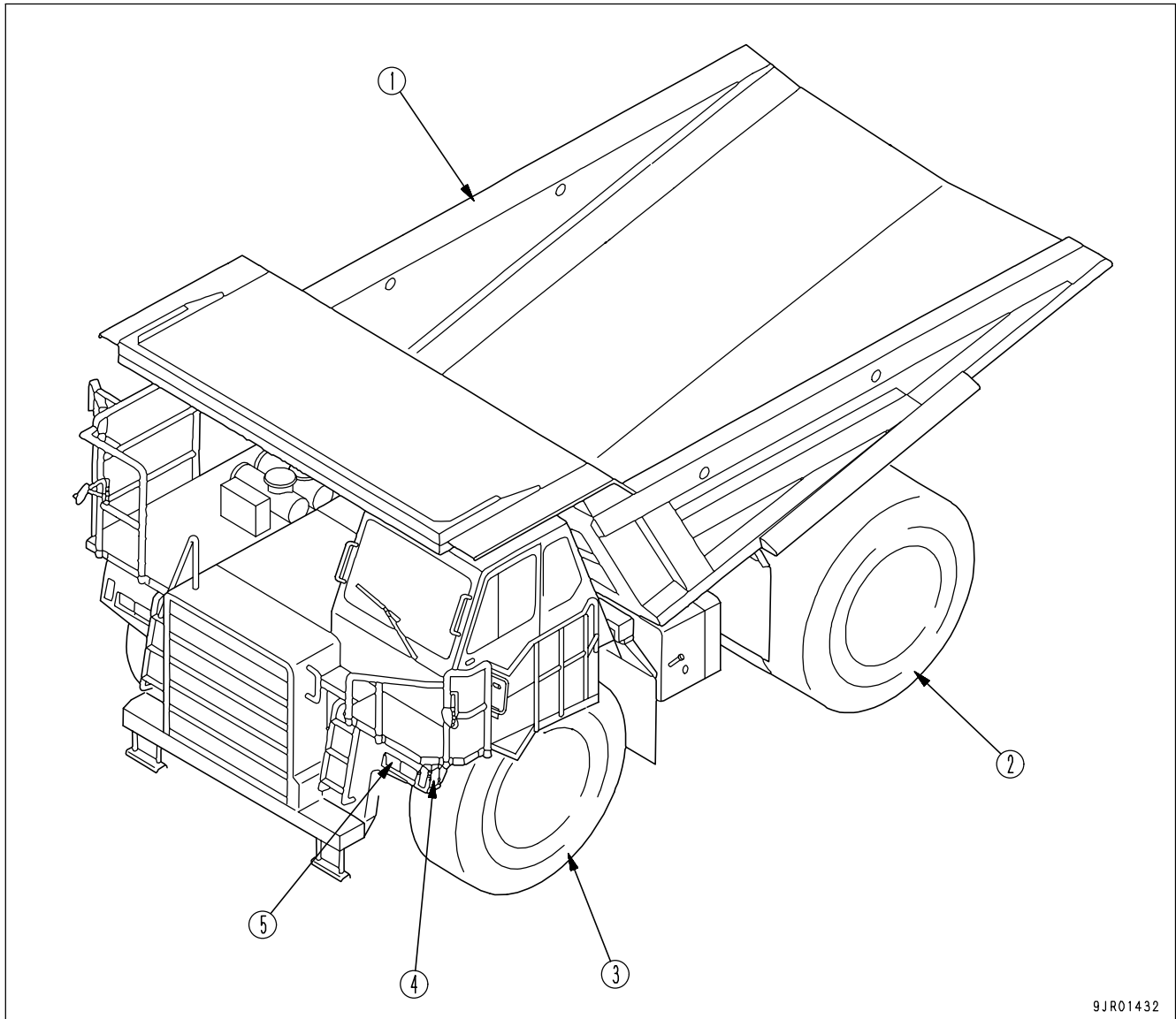
OPERATION

WARNING

Please read and make sure that you understand the SAFETY section before reading this section.

GENERAL VIEW

GENERAL VIEW OF MACHINE

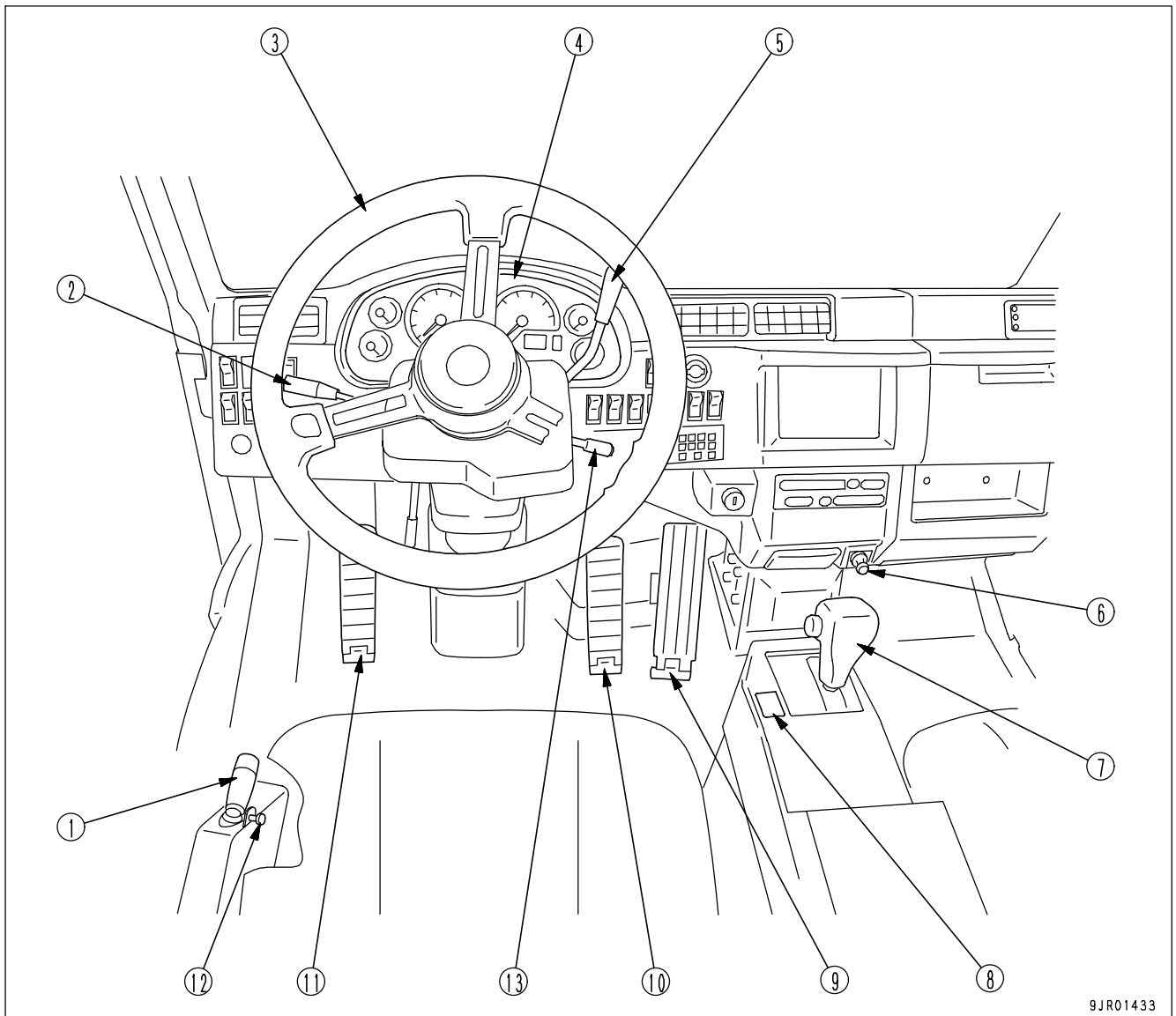


9JR01432

This illustration shows the HD465-7.

- | | |
|-----------------|-----------------------|
| (1) Dump body | (4) Turn signal light |
| (2) Rear wheel | (5) Head lamp |
| (3) Front wheel | |

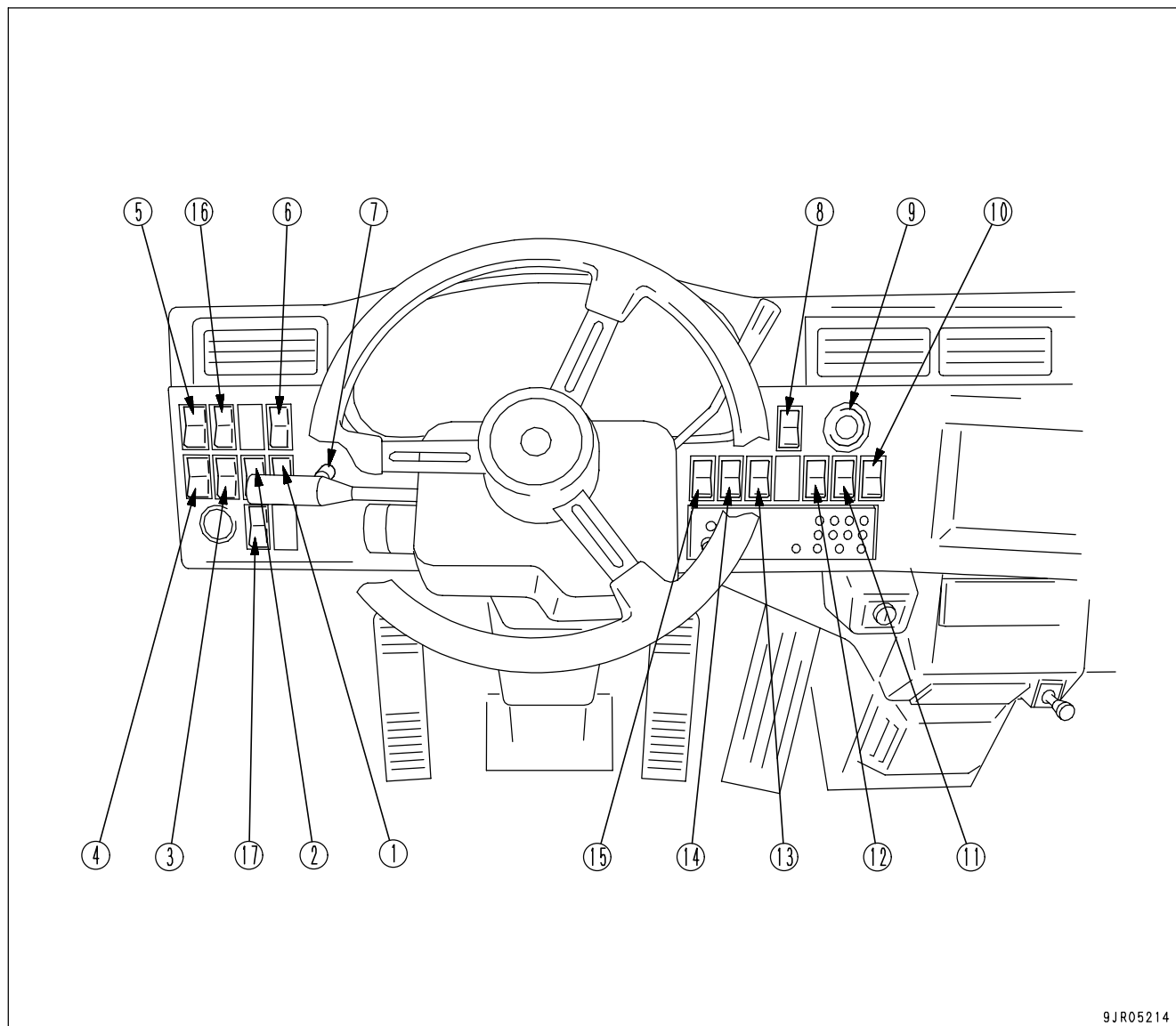
GENERAL VIEW OF CONTROLS AND GAUGES



9JR01433

- | | |
|---|-------------------------------------|
| (1) Dump lever | (8) Parking brake switch |
| (2) Lamp switch, Turn signal lever, Dimmer switch | (9) Accelerator pedal |
| (3) Steering wheel | (10) Brake pedal |
| (4) Machine monitor | (11) Emergency brake pedal |
| (5) Retarder control lever | (12) Safety lock knob |
| (6) Cigarette lighter | (13) Auto retarder (ARSC) set lever |
| (7) Gear shift lever | |

- Enlargement of machine monitor



9JR05214

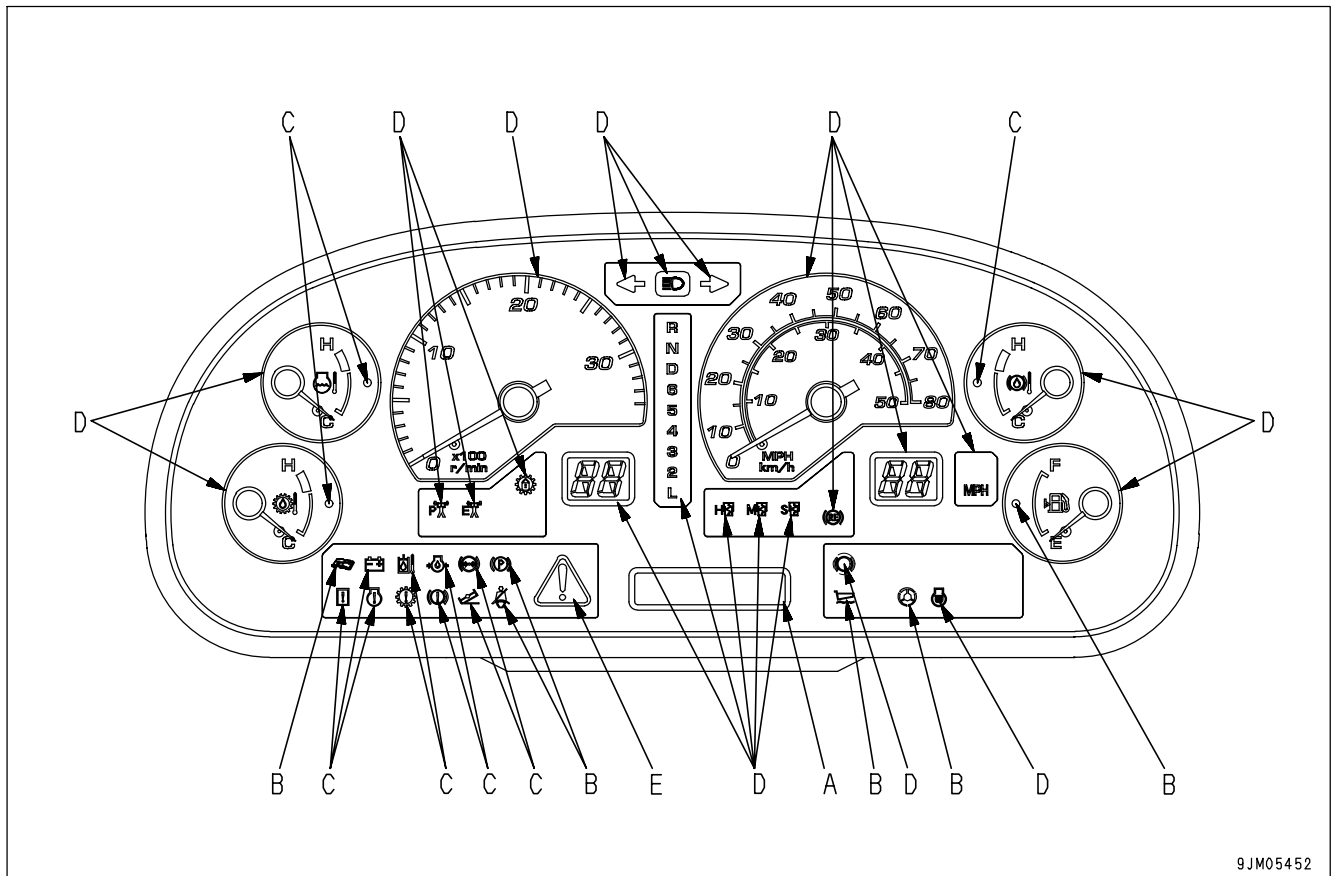
- | | |
|---|---|
| (1) Machine monitor mode selector switch 2 | (10) Power mode selector switch |
| (2) Machine monitor mode selector switch 1 | (11) AISS LOW switch |
| (3) Fog lamp switch (if equipped) | (12) Front brake cut-off switch |
| (4) Yellow rotating lamp switch (if equipped) | (13) Auto retarder (ARSC) switch |
| (5) Side lamp switch (if equipped) | (14) ASR switch (if equipped) |
| (6) Machine monitor bulb check switch | (15) ABS switch (if equipped) |
| (7) Night lighting dimmer switch | (16) Switch for front window glass with heated wire
(defrosting glass) (if equipped) |
| (8) Hazard lamp switch | (17) Switch for mirror with heater (if equipped) |
| (9) Emergency steering switch | |

EXPLANATION OF COMPONENTS

The following is an explanation of devices needed for operating the machine.

To perform suitable operations correctly and safely, it is important to completely understand methods of operating the equipment, and the meanings of the displays.

MACHINE MONITOR



9JM05452

- | | |
|-------------------------|--------------------------|
| A: Character display | D: Meter display portion |
| B: Caution items | E: Central warning lamp |
| C: Emergency stop items | |

NOTICE

When the engine starting switch is turned to the ON position before starting the engine, a system check is carried out for 30 seconds.

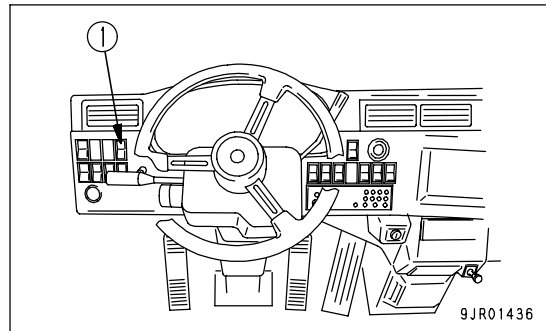
- The central warning lamp lights up for 2 seconds, and then goes out.
- The alarm buzzer sounds for 2 seconds, and then stops.
- The monitor lamp lights up for 2 seconds and then goes out for 1 second.
- The shift indicator displays 88 for 2 seconds and then goes out for 1 second.
- After a 3-second system check, the meter starts to function.
- The character display shows KOMATSU SYSTEM CHECK for 3 seconds.
- If the lamps do not work, there is probably a failure or disconnection, so please contact your Komatsu distributor for inspection.
- When the starting switch is turned ON, if the shift lever is not at the neutral position, after completion of the system check, the shift lever position pilot lamp and the central warning lamp will light up, and the alarm buzzer will continue to sound intermittently. When this happens, if the shift lever is set at neutral, N is displayed, the central warning lamp goes out, and the buzzer stops.

Check central warning lamp, alarm buzzer, monitor lamps, and meters.

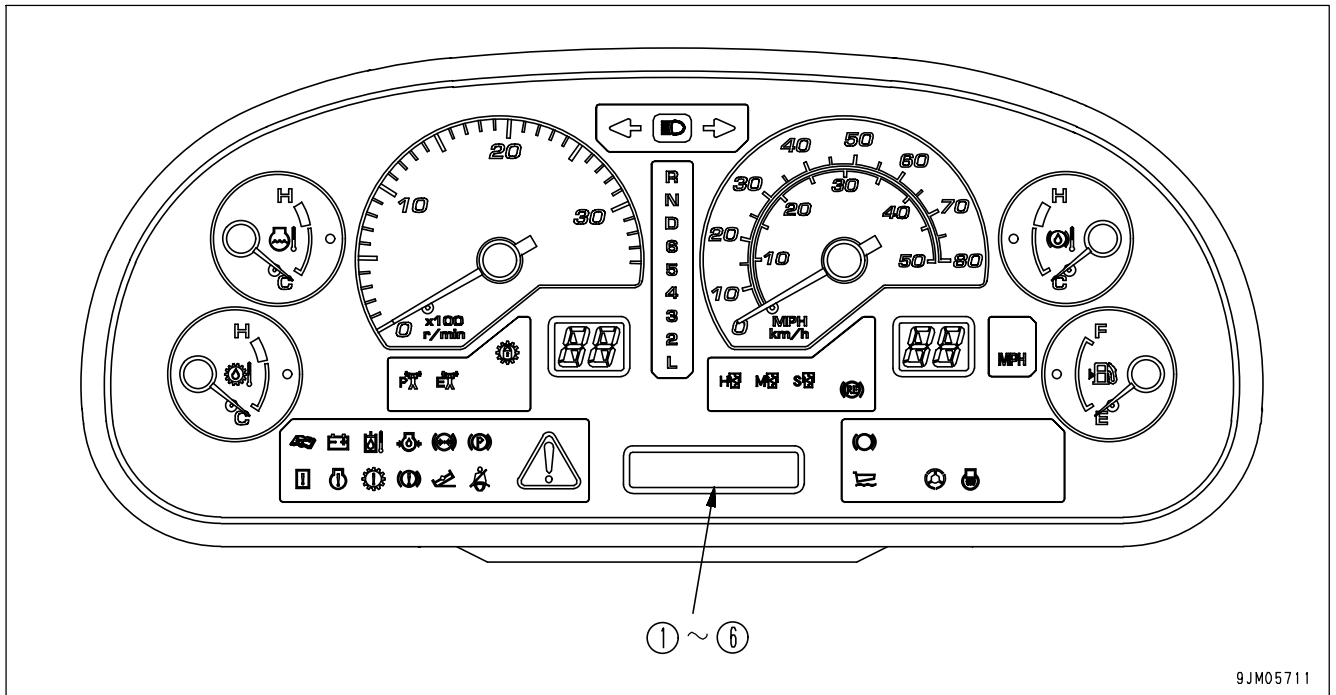
Before starting the engine, turn the starting switch to the ON position, press machine monitor check bulb switch (1), and check that there is no failure in the monitor lamps.

In addition to the gauges that function during the system check, the meter display portion is also actuated. When this happens, the character display shows the machine model and the software version of the machine monitor.

The gauges that do not function have probably failed, so please contact your Komatsu distributor for inspection.



CHARACTER DISPLAY



9JM05711

- (1) Service meter
- (2) Odometer
- (3) Reverse travel odometer
- (4) Action code display
- (5) Filter, oil replacement time display
- (6) Payload display (if equipped)

Normally, the service meter/odometer is displayed on the character display.

If the machine has failed, or if there has been excessive load on the machine, or if it is necessary to carry out inspection and maintenance, an action code is displayed to recommend suitable action.

When the time for replacing the filter or changing the oil is reached, after completion of the system check with the starting switch at the ON position, the maintenance monitor caution lamps flash or light up, and at the same time, the filter or oil to be replaced is displayed.

For details of the payload display, see "HANDLING PAYLOAD METER (VHMS BUILT-IN TYPE) (PAGE 6-21)" in ATTACHMENTS, OPTIONS.

NOTICE

Information regarding the failure of the machine or maintenance is displayed on the character display when the starting switch is at the ON position, check the display to confirm that there is no problem before starting to travel.

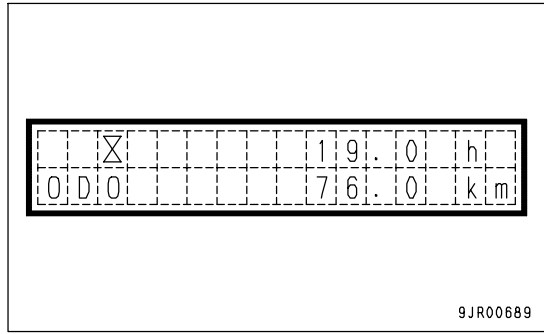
SERVICE METER

This meter (1) shows the total time that the machine has been operating.

While the engine is running, the service meter advances even if the machine is not moving.

The meter advances by 1 for every hour of operation, regardless of the engine speed.

Even if the starting switch is at the OFF position, the service meter will display as long as the top part (◇) of machine monitor mode selector switch 1 is being pressed.



9JR00689

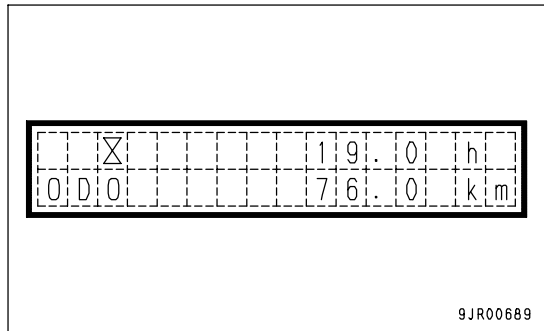
NOTICE

When the starting switch is at the OFF position, if the service meter is displayed even although the top (◇) of machine monitor mode selector switch 1 is not being pressed, there is probably a failure in the machine, so please contact your Komatsu distributor for inspection.

ODOMETER

This meter (2) indicates the total distance traveled in kilometers.

Even when the starting switch is at the OFF position, while the top (◇) of machine monitor mode selector switch 1 is being pressed, it indicates the total distance traveled.



9JR00689

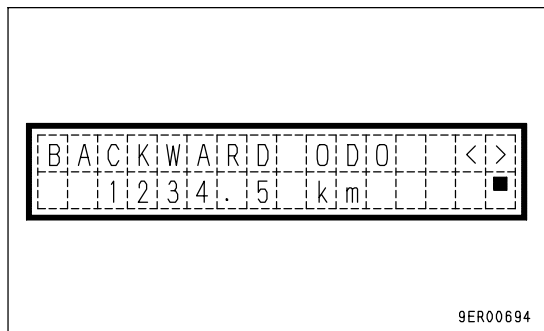
NOTICE

When the starting switch is at the OFF position, if the total distance is displayed even although the top (◇) of machine monitor mode selector switch 1 is not being pressed, there is probably a failure in the machine, so please contact your Komatsu distributor for inspection.

REVERSE TRAVEL ODOMETER

This meter (3) indicates the total distance traveled in reverse in kilometers.

For details of the method of displaying the total distance traveled in reverse, see "OTHER FUNCTIONS OF MACHINE MONITOR (PAGE 3-26)".



9ER00694

ACTION CODE DISPLAY



If action code E03 is displayed, stop the machine immediately. Then see "ACTION CODE (PAGE 3-138)" and contact your Komatsu distributor for repairs.

If the machine has failed, or if there has been excessive load on the machine, or if it is necessary to carry out inspection and maintenance, an action code is displayed on this panel (4) to recommend suitable action.

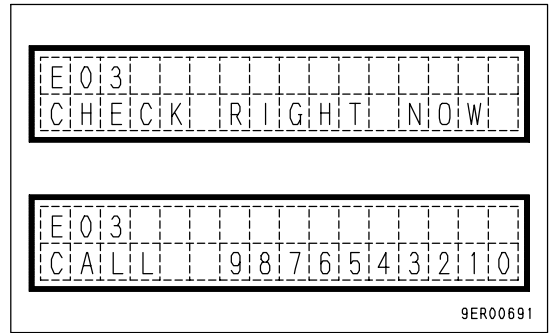
If more than one failure occurs at the same time, the most important action code is displayed. The order of importance, starting from the highest, is E03, E02, and E01. If failures of equal importance occur at the same time, the latest one is displayed.

When action codes E02 or E03 occur, the alarm buzzer sounds intermittently and the central warning lamp lights up.

E03: When this code is displayed, stop the machine immediately, check the failure code, and contact your Komatsu distributor for repairs.

REMARK

- The top line of the character display displays "E03" and the bottom line displays "CHECK RIGHT NOW" and "CALL" in turn for 3 seconds each.
- The telephone number is displayed on the right of the "CALL" display. If the telephone number has not been set, there is a blank. For details of the method of setting the telephone number, see "INPUT METHOD FOR TELEPHONE NUMBER (PAGE 3-27)".



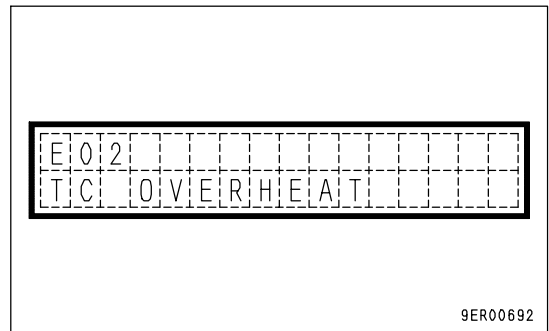
E02: If overrun related information is displayed, reduce the engine speed and the speed of the machine while continuing operations.

If the overheat related display is given, stop the machine and run the engine under no load at a mid-range speed.

If an action code is still displayed after doing this, check the failure code and contact your Komatsu distributor for repairs.

REMARK

The top line of the character display displays "E02" and the bottom line displays the condition of the machine related to overrun or overheat.

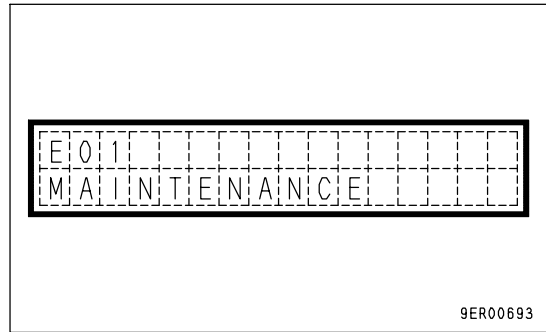


E01: If maintenance location is displayed and the maintenance caution lamp lights up, carry out inspection and maintenance of the displayed item after the completion of operations or when the shift changes.

If "MAINTENANCE" is displayed together with E01, check the failure code and contact your Komatsu distributor for repairs.

REMARK

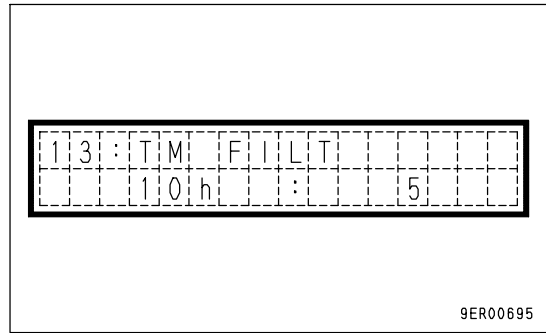
The top line of the character display displays "E01" and the bottom line displays "MAINTENANCE" or displays the location needing inspection, filling, or replacing.



FILTER, OIL REPLACEMENT TIME DISPLAY

After completion of the system check, this display (5) shows for 30 seconds the filters and oil which are near the replacement interval. The maintenance caution lamp also flashes or lights up at the same time.

After replacing the filter or changing the oil, reset the replacement interval. For details, see "RESET METHOD FOR FILTER, OIL REPLACEMENT TIME (PAGE 3-26)".



REMARK

- The top line of the character display shows the name and ID number of the item needing replacement. The line at the bottom shows the remaining time until replacement and the total number of times the item has been replaced.
- After giving the display for 30 seconds, the display does not appear again until the starting switch is turned again to the ON position.
- If the action code is being displayed, the message in the diagram above is not displayed on the character display.
- If there two or more items to be displayed, they are displayed every three seconds.
- If there are more than 10 items to be displayed, all the items are displayed once each.
- The display is given when the time reaches 30 hours before the filter and oil replacement interval.
- When the replacement interval approaches, the maintenance caution lamp flashes, and if the replacement interval has passed, the lamp lights up.

Items for display of filter, oil replacement time

Item	Replacement interval	Character display	ID number
Fuel filter	500	FUEL FILT	03
Engine oil filter	500	ENG FILT	02
Engine oil	500	ENG OIL	01
Transmission oil filter	500	TM FILT	13
Corrosion resistor	1000	CORR RES	06
Torque converter, transmission and rear brake cooling oil	1000	TC/TM/BKOIL	24
Brake oil filter	1000	BK OIL FILT	14
Brake cooling oil filter	1000	BK C FILT	16
Steering, hoist oil filter	2000	HYD FILT	04
Differential case oil	2000	DIFF OIL	11
Final drive oil	2000	FNL OIL	08
Steering, hoist oil	4000	HYD OIL	10

REMARK

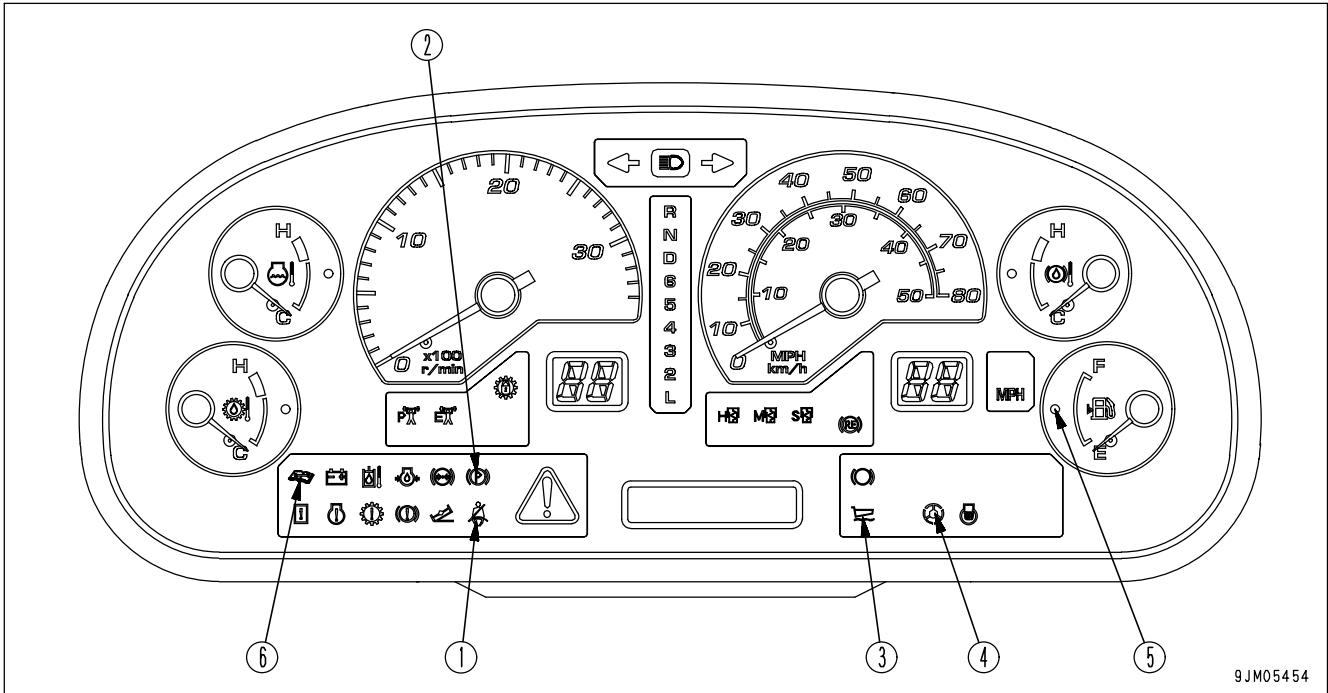
See the section below for details of the procedure for replacing the filter and oil.

- Fuel filter
"REPLACE FUEL FILTER CARTRIDGE (PAGE 4-52)"
- Engine oil filter
"CHANGE OIL IN ENGINE OIL PAN, REPLACE ENGINE OIL FILTER CARTRIDGE (PAGE 4-51)"
- Engine oil
"CHANGE OIL IN ENGINE OIL PAN, REPLACE ENGINE OIL FILTER CARTRIDGE (PAGE 4-51)"
- Transmission oil filter
"REPLACE TRANSMISSION OIL FILTER ELEMENT (PAGE 4-55)"
- Corrosion resistor
"REPLACE CORROSION RESISTOR CARTRIDGE (PAGE 4-58)"
- Torque converter, transmission and rear brake cooling oil
"CHANGE OIL IN TRANSMISSION CASE, CLEAN TRANSMISSION CASE STRAINER (PAGE 4-59)"
- Brake oil filter
"REPLACE BRAKE OIL FILTER ELEMENT (PAGE 4-62)"
- Brake cooling oil filter
"REPLACE TRANSMISSION AND REAR BRAKE COOLING OIL FILTER ELEMENT (PAGE 4-61)"
- Steering, hoist oil filter
"REPLACE STEERING, HOIST OIL TANK FILTER ELEMENT (PAGE 4-65)"
- Differential case oil
"CHANGE OIL IN DIFFERENTIAL CASE (PAGE 4-67)"
- Final drive oil
"CHANGE OIL IN FINAL DRIVE CASE (PAGE 4-67)"
- Steering, hoist oil
"CHANGE OIL IN STEERING, HOIST OIL TANK (PAGE 4-70)"

CAUTION ITEMS

! CAUTION

If the monitor lights up during travel, inspect the location of the problem quickly and take the necessary action.

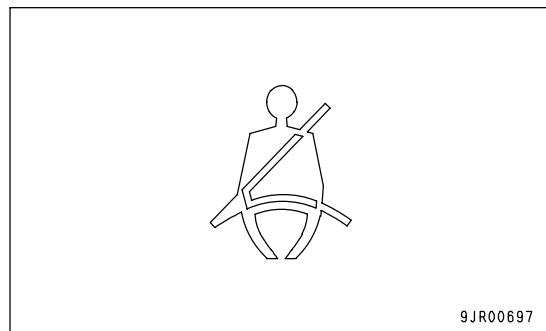


9JM05454

- (1) Seat belt caution lamp
- (2) Parking brake pilot lamp
- (3) Dump body pilot lamp
- (4) Emergency steering pilot lamp
- (5) Fuel level caution lamp
- (6) Maintenance caution lamp

SEAT BELT CAUTION LAMP

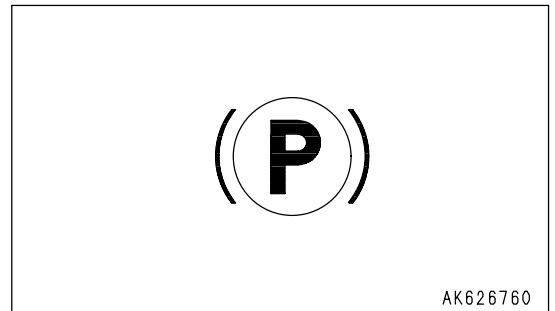
This monitor (1) lights up if the seat belt is not fastened. There is danger when traveling, so always fasten your seat belt.



9JR00697

PARKING BRAKE PILOT LAMP

This monitor (2) lights up when the parking brake is applied.



DUMP BODY PILOT LAMP

This monitor (3) lights up when the dump body is raised or the dump body lever is at any position other than "FLOAT".

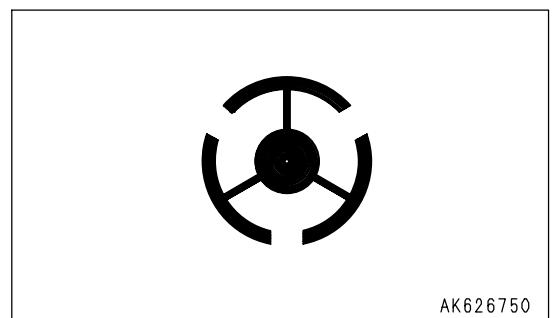


EMERGENCY STEERING PILOT LAMP

This monitor (4) lights up when the emergency steering is actuated.

(Machines equipped with auto emergency steering)

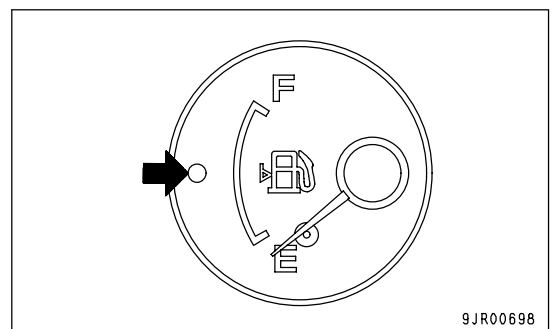
If any problem should occur in the steering oil pressure circuit when the machine is traveling, the auto emergency steering is actuated and the related lamp lights up.



FUEL LEVEL CAUTION LAMP

This monitor (5) lights up when the level of the fuel remaining in the fuel tank goes below 140 liters (37.0 US gal).

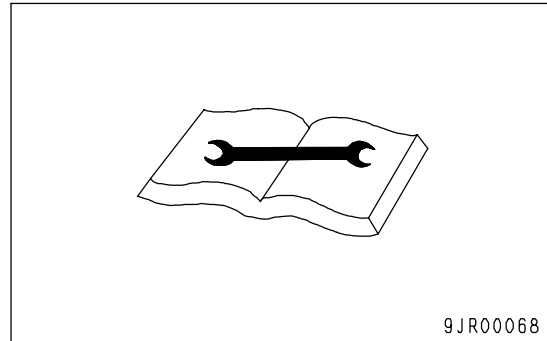
If it lights up, check the fuel level and add fuel.



MAINTENANCE CAUTION LAMP

This monitor (6) lights up if any of the the following are applicable. When it lights up, action code "E01" and the location needing maintenance are displayed on the character display at the same time, so carry out inspection, filling, or replacement.

- Drop in engine oil level (if equipped)
- Clogged engine oil filter (if equipped)
- Drop in oil level in steering, hoist oil tank (if equipped)
- Clogged air cleaner
- Clogged steering, hoist oil filter (if equipped)
- Clogged transmission oil filter
- Drop in engine cooling water level
- Clogged brake cooling oil filter (if equipped)
- Worn brake disc (rear) (if equipped)
- Drop in battery electrolyte level (if equipped)
- Drop in transmission oil level (if equipped)

**REMARK**

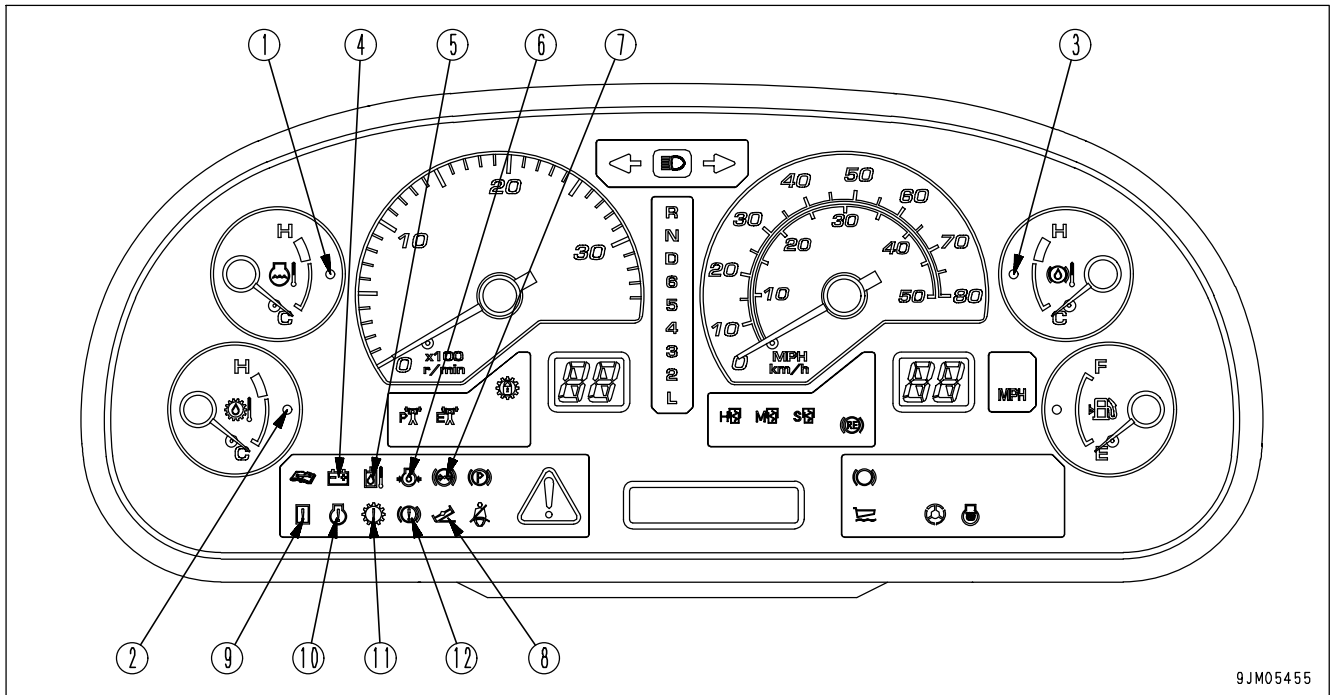
In addition to the above, if the filter or oil replacement time is displayed on the character display, the lamp will flash or light up.

EMERGENCY STOP ITEM

! CAUTION

If the monitor lights up, stop operations immediately, then check the corresponding area and carry out the action.

If any problem is found in the emergency stop items, the alarm buzzer will sound intermittently, and the monitor for the location of the problem and the central warning lamp will light up.



9JM05455

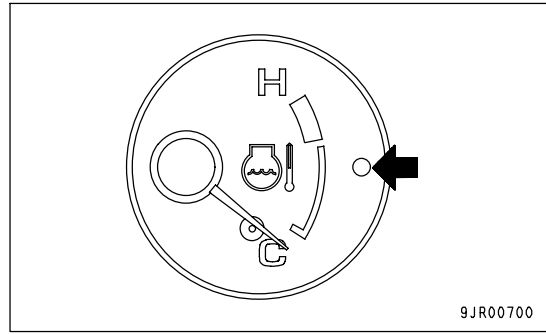
- | | |
|---|---|
| <ul style="list-style-type: none"> (1) Engine water temperature caution lamp (2) Torque converter oil temperature caution lamp (3) Retarder oil temperature caution lamp (4) Battery charge circuit caution lamp (5) Steering oil temperature caution lamp (if equipped) (6) Engine oil pressure caution lamp | <ul style="list-style-type: none"> (7) Brake oil pressure caution lamp (accumulator oil pressure) (8) Tilt caution lamp (if equipped) (9) Machine monitor, option system caution lamp (10) Engine system caution lamp (11) Transmission system caution lamp (12) Retarder system caution lamp |
|---|---|

ENGINE WATER TEMPERATURE CAUTION LAMP

This monitor (1) warns the operator that the engine coolant temperature has risen.

When it lights up, "E02 ENGINE OVERHEAT" is displayed on the character display at the same time, and the engine output is automatically limited.

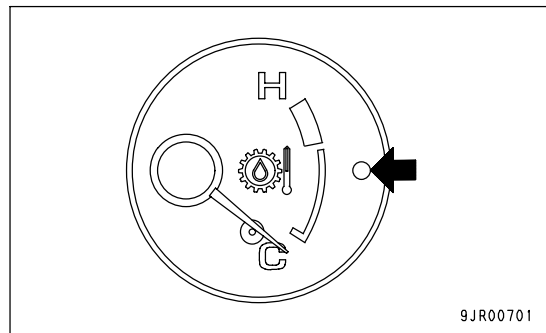
Run the engine under no load at a mid-range speed until the lamp goes out.



TORQUE CONVERTER OIL TEMPERATURE CAUTION LAMP

This monitor (2) warns the operator that the torque converter oil temperature has risen.

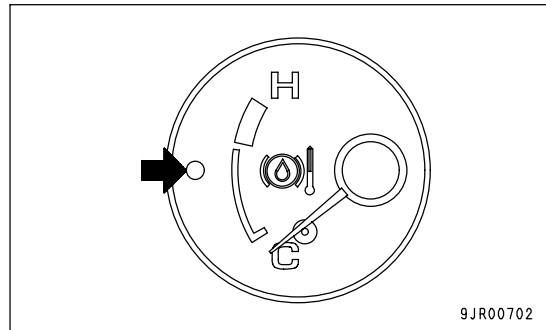
When it lights up, "E02 TC OVERHEAT" is displayed on the character display at the same time, so stop the machine in a safe place, set the shift lever to the N position, and run the engine under no load at a mid-range speed until the lamp goes out.



RETARDER OIL TEMPERATURE CAUTION LAMP

This monitor (3) warns the operator that the brake oil temperature has risen.

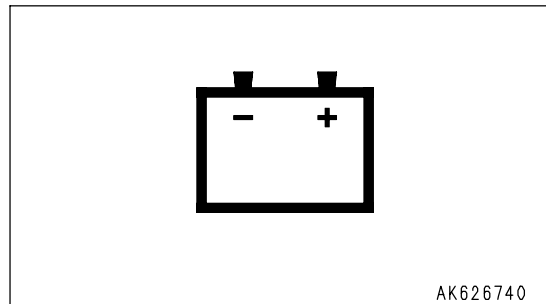
When it lights up, "E02 BRAKE OVERHEAT" is displayed on the character display at the same time, so stop the machine in a safe place, set the shift lever to the N position, and run the engine under no load at a mid-range speed until the lamp goes out.



BATTERY CHARGE CIRCUIT CAUTION LAMP

This monitor (4) lights up when the engine is running to warn the operator of a problem in the charging system.

When it lights up, "E03 CHECK RIGHT NOW" is displayed on the character display at the same time, so stop the machine immediately at a safe place, then stop the engine and check the charging circuit.

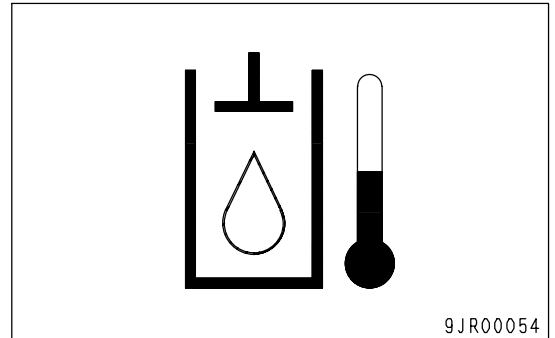


STEERING OIL TEMPERATURE CAUTION LAMP

(If equipped)

This monitor (5) lights up to warn the operator that the steering oil temperature has risen.

When it lights up, "E02 STRG OVERHEAT" is displayed on the character display at the same time, so stop the machine in a safe place, set the shift lever to the N position, and run the engine under no load at a mid-range speed until the lamp goes out.

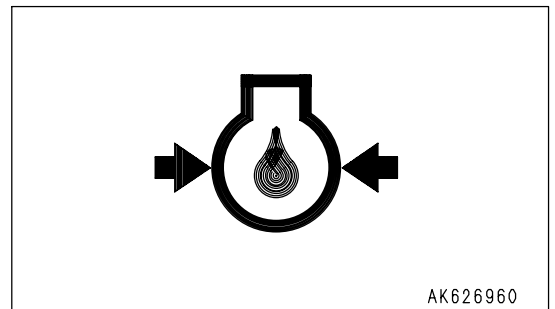


ENGINE OIL PRESSURE CAUTION LAMP

This monitor (6) lights up to warn the operator that the engine lubricating oil pressure has dropped.

When it lights up, "E03 CHECK RIGHT NOW" is displayed on the character display, and the engine output is automatically limited. Stop the machine immediately at a safe place, then stop the engine and carry out inspection.

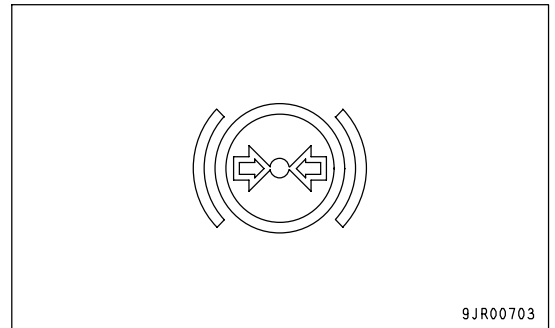
The lamp lights up if the engine lubricating oil pressure goes below the specified value when the engine is running,
If the engine is not running, the lamp does not light up.



BRAKE OIL PRESSURE CAUTION LAMP

This monitor (7) lights up to warn the operator that the brake accumulator oil pressure has dropped below the specified value. The central warning lamp and alarm buzzer are not actuated when the engine is stopped.

If the accumulator oil pressure is still lower than the specified value 30 seconds after the engine has been started, "E03 CHECK RIGHT NOW" is displayed on the character display, so stop the machine immediately at a safe place, then stop the engine and carry out inspection.

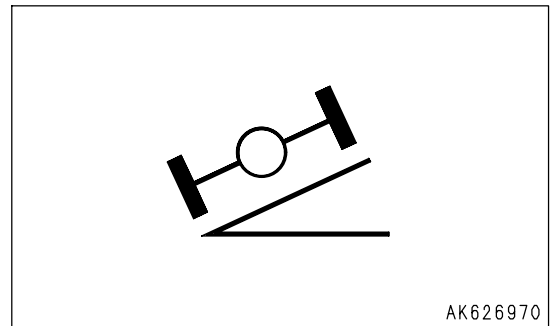


TILT CAUTION LAMP

(If equipped)

This monitor (8) lights up if the dump body has left its seat when the rear frame of the machine has tilted beyond the safety range to the left or right.

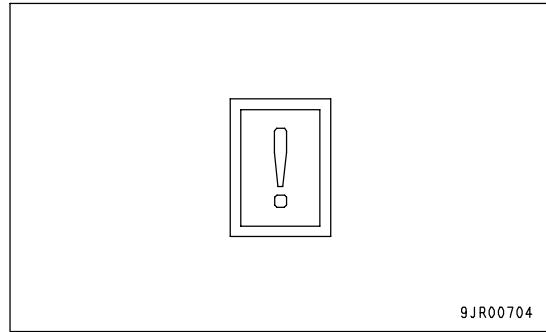
Lower the dump body and move the machine to a safe place where the machine is stable.



MACHINE MONITOR, OPTION SYSTEM CAUTION LAMP

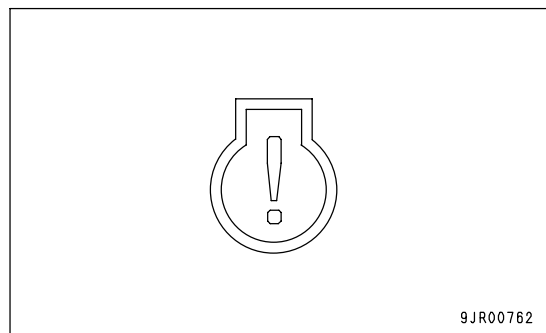
This monitor (9) lights up when a problem has been detected in the machine monitor or in the system for an installed option.

When it lights up, "E03 CHECK RIGHT NOW" is displayed on the character display at the same time, so stop the machine immediately at a safe place, then stop the engine and carry out inspection.

**ENGINE SYSTEM CAUTION LAMP**

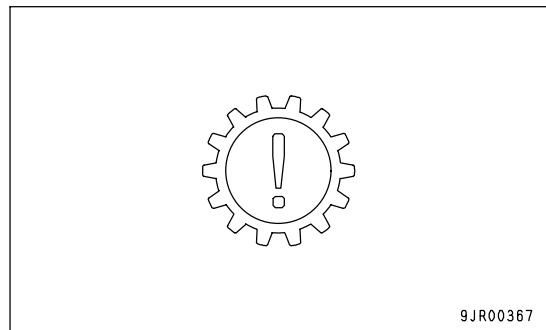
This monitor (10) lights up when a problem has been detected in the system controlled by the engine controller.

When it lights up, "E03 CHECK RIGHT NOW" is displayed on the character display at the same time, so stop the machine immediately at a safe place, then stop the engine and carry out inspection.

**TRANSMISSION SYSTEM CAUTION LAMP**

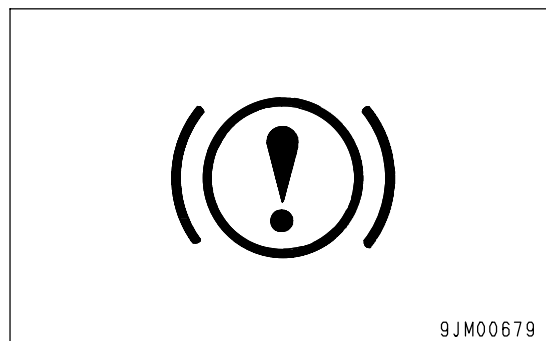
This monitor (11) lights up when a problem has been detected in the system controlled by the transmission controller.

When it lights up, "E03 CHECK RIGHT NOW" is displayed on the character display at the same time, so stop the machine immediately at a safe place, then stop the engine and carry out inspection.

**RETARDER SYSTEM CAUTION LAMP**

This monitor (12) lights up when a problem has been detected in the system controlled by the retarder controller.

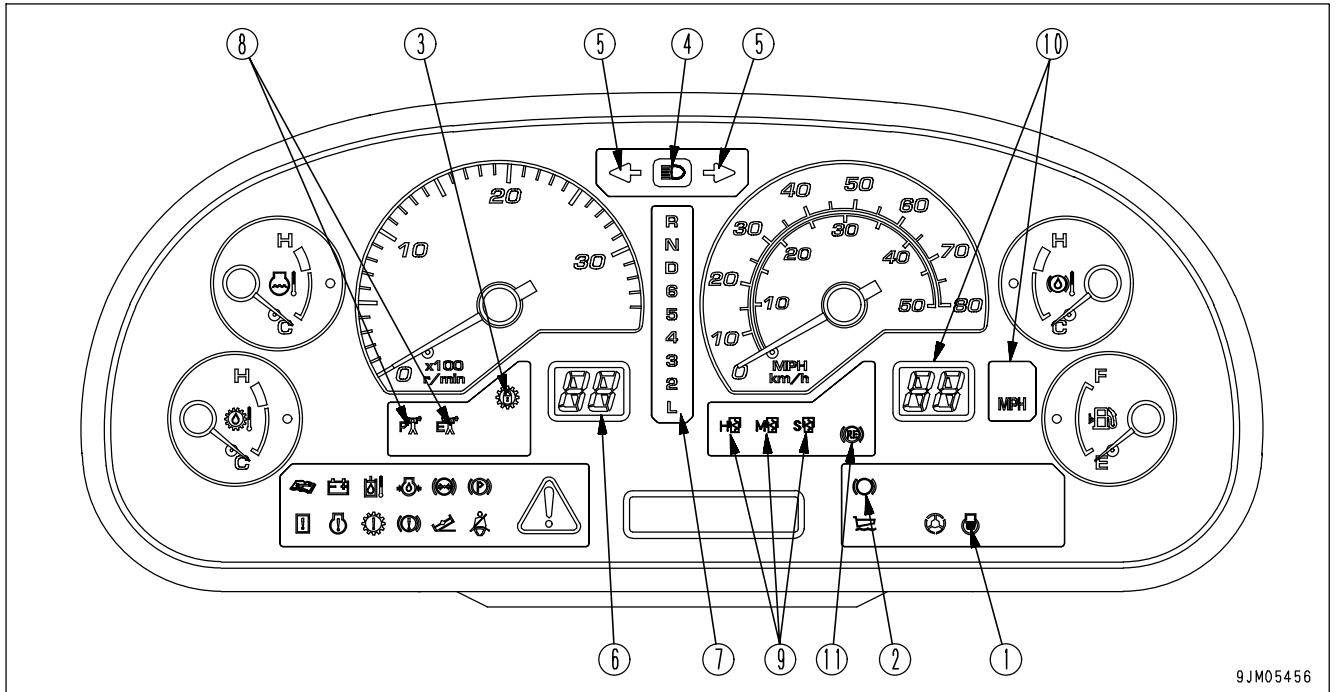
When it lights up, "E03 CHECK RIGHT NOW" is displayed on the character display at the same time, so stop the machine immediately at a safe place, then stop the engine and carry out inspection.



METER DISPLAY PORTION

PILOT DISPLAY PORTION

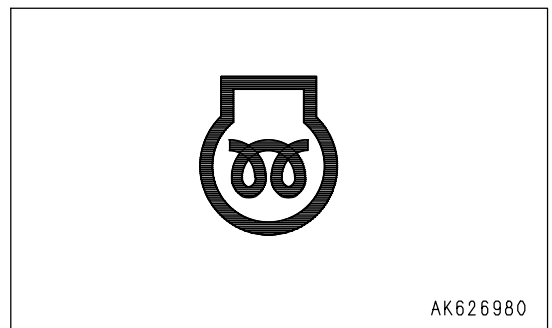
When starting switch is ON, the pilot display lights up when display items are functioning.



- | | |
|------------------------------------|---|
| (1) Engine pre-heating pilot lamp | (7) Shift lever position pilot lamp |
| (2) Retarder pilot lamp | (8) Power mode pilot lamp |
| (3) Lockup pilot lamp | (9) Auto suspension mode pilot lamp (if equipped) |
| (4) Head lamp high beam pilot lamp | (10) Auto retarder set speed indicator |
| (5) Turn signal pilot lamp | (11) Auto retarder READY pilot lamp |
| (6) Shift indicator | |

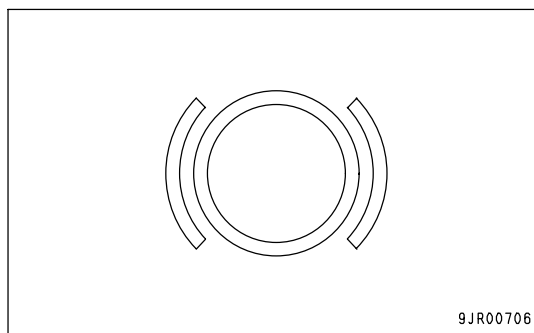
ENGINE PRE-HEATING PILOT LAMP

This monitor (1) lights up when the electrical heater for pre-heating the engine is being actuated. When the starting switch is turned to the ON position in cold weather, the monitor lights up. It goes out after 20 to 30 seconds to indicate that the pre-heating has been completed.

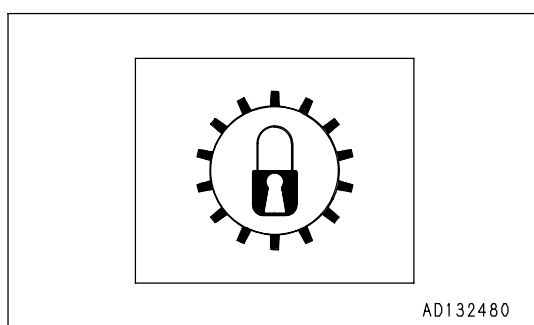


RETARDER PILOT LAMP

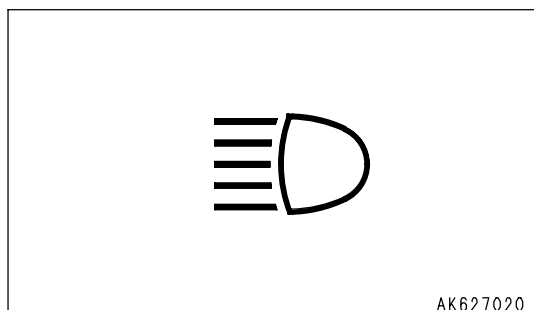
This monitor (2) lights up when the retarder control lever is pulled and the retarder is actuated.

**LOCKUP PILOT LAMP**

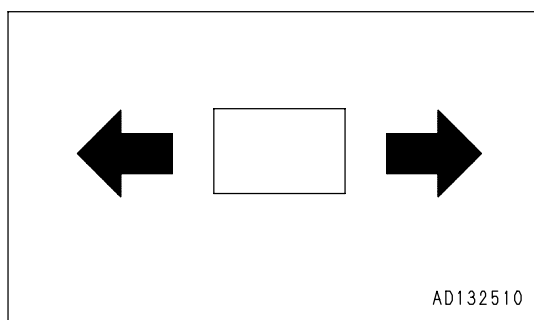
This monitor (3) lights up when the torque converter lockup is engaged and the transmission is shifted to direct drive.

**HEAD LAMP HIGH BEAM PILOT LAMP**

This monitor (4) lights up when the head lamps are set to high beam.

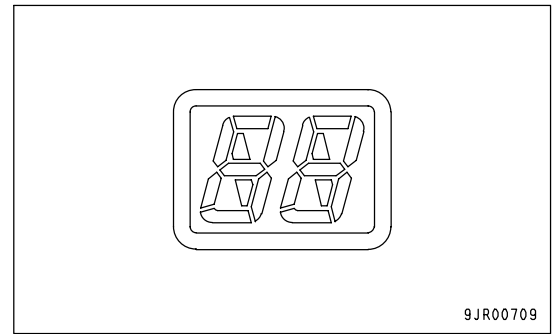
**TURN SIGNAL PILOT LAMP**

This monitor (5) flashes at the same time as the turn signal lamp flashes.



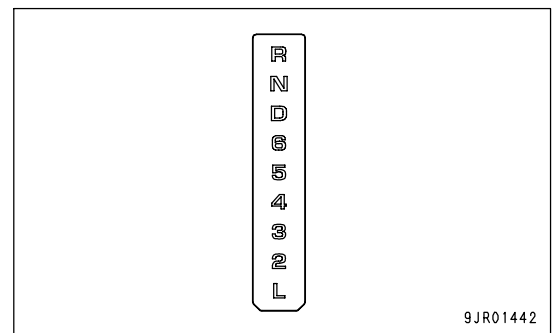
SHIFT INDICATOR

This monitor (6) shows the transmission shift range (speed range).

**SHIFT LEVER POSITION PILOT LAMP**

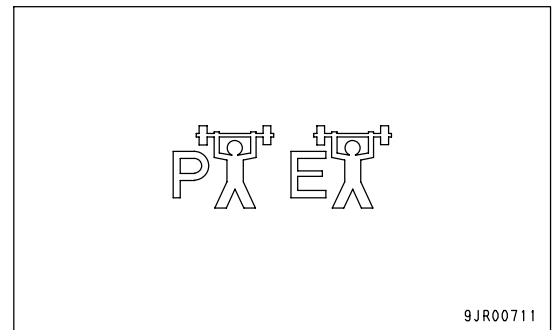
This monitor (7) displays the position of the shift lever.

The letter or number for the speed range selected by the shift lever lights up.

**POWER MODE PILOT LAMP**

This monitor (8) displays the power mode.

When the mode is selected with the power mode selector switch, either High Power (P) or Economy (E) lights up.



AUTO SUSPENSION MODE PILOT LAMP

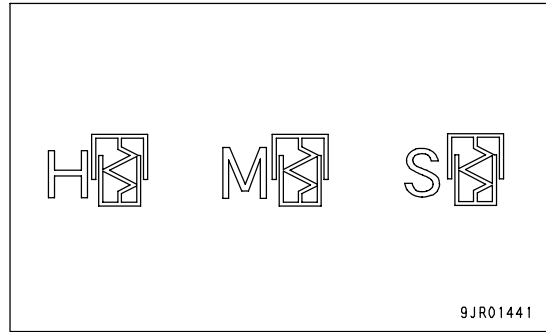
(If equipped)

This monitor (9) displays the suspension mode, when the machine is equipped with the suspension controller.

On machines equipped with an automatic suspension system, the suspension system automatically switches the damping characteristics of the suspension according to the size of the load, use of the brake, operation of the steering, and operation of the dump control.

Normally it is set to the soft mode when the dump truck is traveling empty and to the medium mode when it is traveling loaded. When the foot brake is operated or the machine is suddenly turned, or the dump control is operated, the suspension mode is switched to insure the stability of the machine to the front and rear, and left and right.

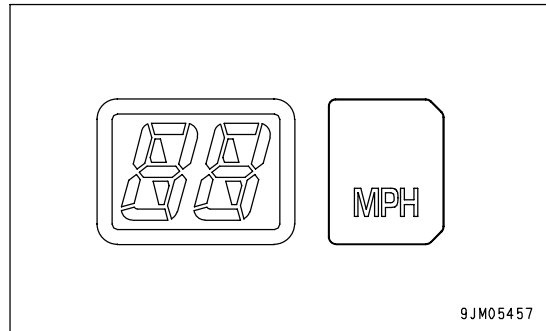
- H : Hard mode
- M : Medium mode
- S : Soft mode



AUTO RETARDER SET SPEED INDICATOR

This monitor (10) displays the set travel speed for the auto retarder speed control (ARSC).

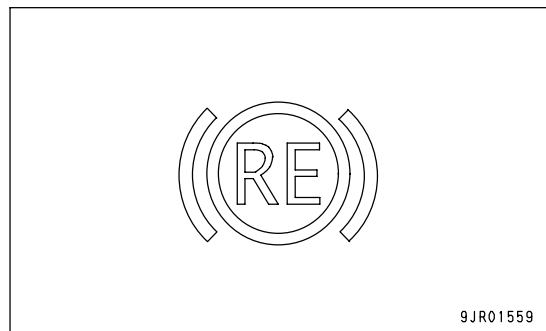
When the auto retarder (ARSC) switch is OFF, the monitor goes out. If the set travel speed has been canceled, 0 is displayed.



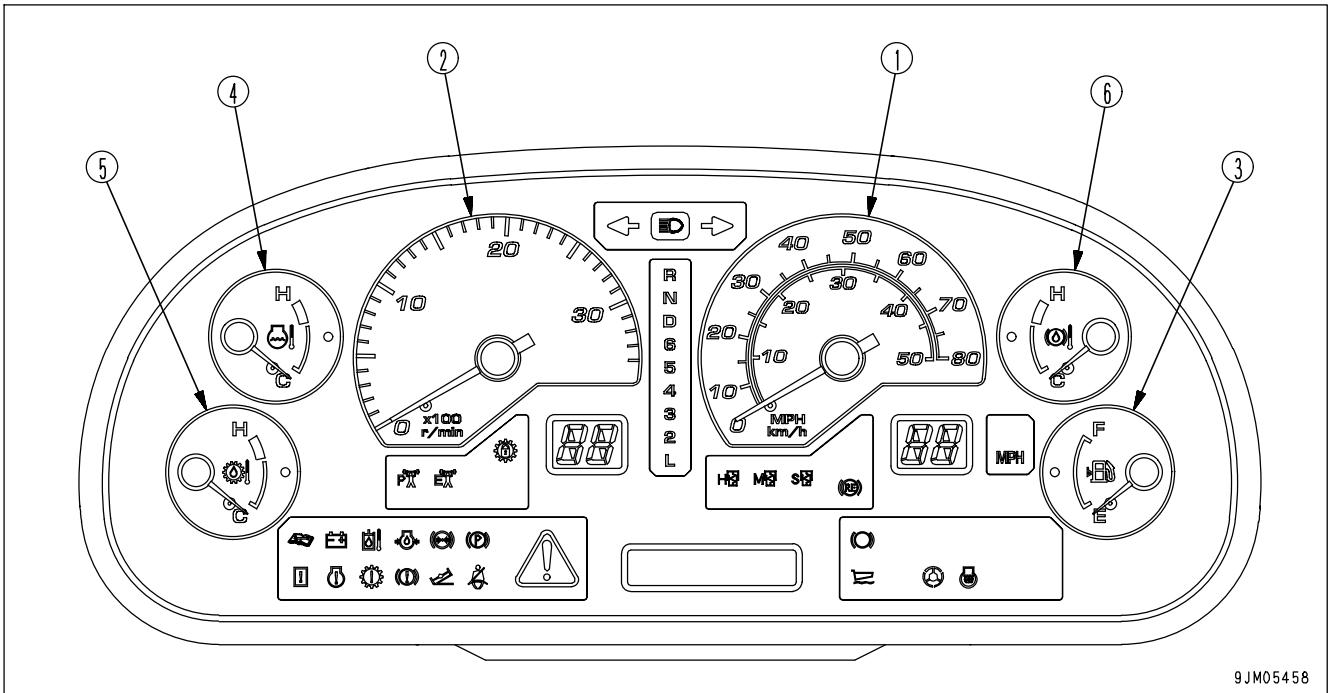
AUTO RETARDER READY PILOT LAMP

This monitor (11) shows that the auto retarder speed control can be actuated at the set travel speed.

When the monitor is OFF, the auto retarder speed control is not actuated.



METERS

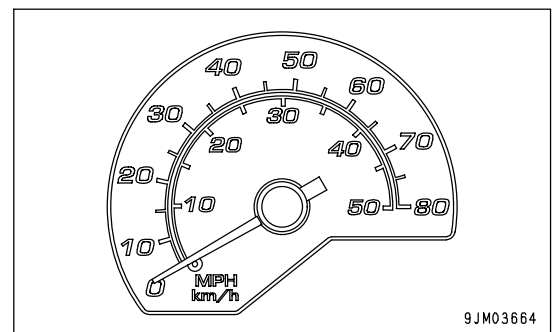


9JM05458

- (1) Speedometer
- (2) Engine tachometer
- (3) Fuel gauge
- (4) Engine water temperature gauge
- (5) Torque converter oil temperature gauge
- (6) Retarder oil temperature gauge

SPEEDOMETER

This meter (1) indicates the travel speed of the machine.

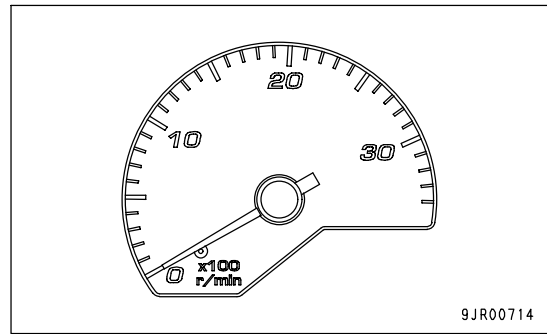


9JM03664

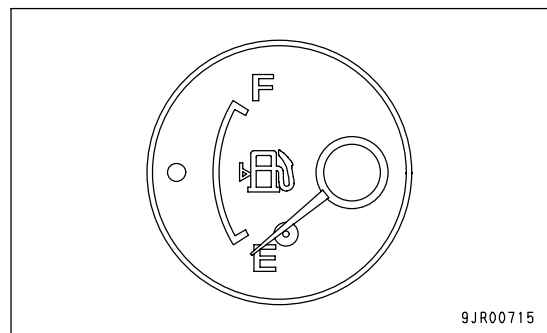
ENGINE TACHOMETER

This meter (2) shows the engine speed.

If the gauge indicator the red range during operations, the alarm buzzer will sound and the central warning lamp will light up at the same time, so reduce the engine speed and the machine travel speed.

**FUEL GAUGE**

This meter (3) shows the amount of fuel remaining in the fuel tank. When the fuel level caution lamp lights up, it indicates that there is less than 140 liters (37.0 US gal) of fuel remaining in the tank, so check and add fuel.

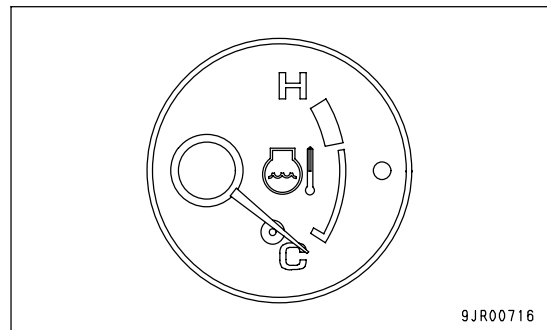
**ENGINE WATER TEMPERATURE GAUGE**

This meter (4) indicates the engine water temperature.

It should be in the white range during operation.

If it is in the red range during operation, the alarm buzzer will sound and the central warning lamp will light up at the same time. "E02 ENGINE OVERHEAT" is displayed on the character display, so run at the engine under no load at a mid-range speed and wait until the meter enters the white range.

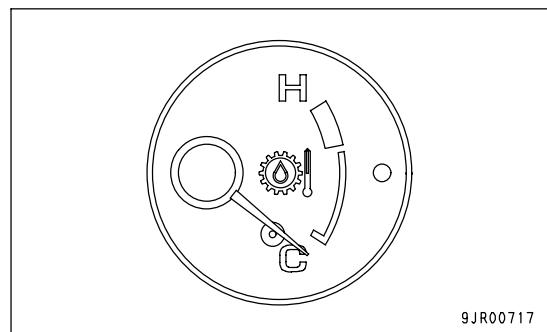
If it is in the red range, the engine output is automatically limited.

**TORQUE CONVERTER OIL TEMPERATURE GAUGE**

This meter (5) indicates the torque converter oil temperature.

It should be in the white range during operation.

If it is in the red range during operation, the alarm buzzer will sound and the central warning lamp will light up. "E02 TC OVERHEAT" is displayed on the character display, so run the engine under no load at a mid-range speed and wait until the meter enters the white range.

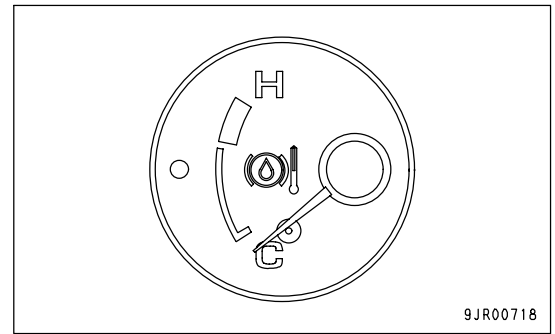


RETARDER OIL TEMPERATURE GAUGE

This meter (6) indicates the retarder oil temperature.

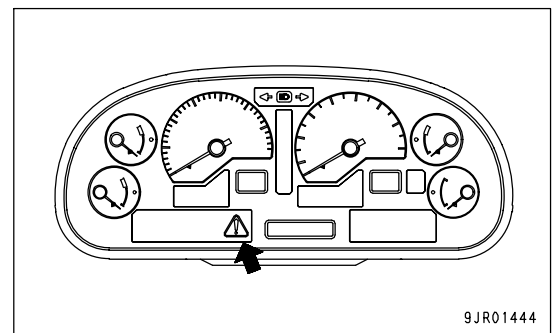
It should be in the white range during operation.

If it is in the red range during operation, the alarm buzzer will sound and the central warning lamp will light up at the same time. "E02 BRAKE OVERHEAT" is displayed on the character display, so stop the machine in a safe place, set the shift lever to the N position, run the engine under no load at a mid-range speed and wait until the lamp goes out.

**CENTRAL WARNING LAMP**

If the machine is in the following condition, this lamp will flash, and at the same time, the alarm buzzer will sound intermittently.

- When a problem has occurred in any of "EMERGENCY STOP ITEM (PAGE 3-15)".
- When action code "E02" or "E03" is displayed on the character display.
- If the parking brake is applied, but the shift lever is not at the N position.
- When the dump lever is not at the FLOAT position or the dump body is raised and the shift lever is not at the N position.
- When the engine tachometer indicates the red range.

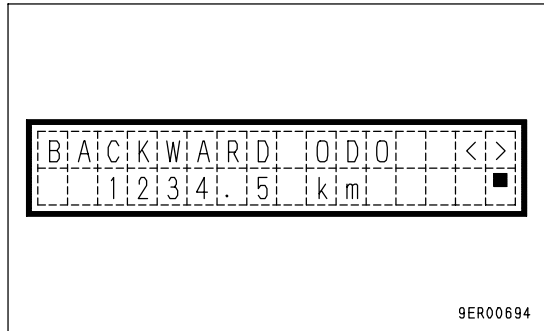


OTHER FUNCTIONS OF MACHINE MONITOR

DISPLAY METHOD FOR REVERSE TRAVEL ODOMETER

Use this when checking the total travel distance in reverse.

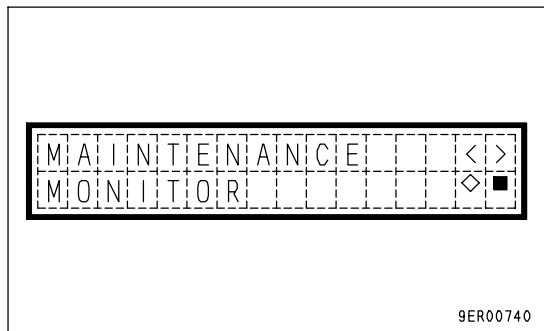
1. Check that the character display is showing the service meter/odometer, or the action code. If it is giving any other display, turn the starting switch OFF, then turn the starting switch to the ON position and wait for the above display to be given.
2. Press the (◇) of machine monitor mode selector switch 1. It displays the overall distance traveled in reverse.
3. When completing the operation, press (■) of machine monitor mode selector switch 1 or turn the starting switch OFF.



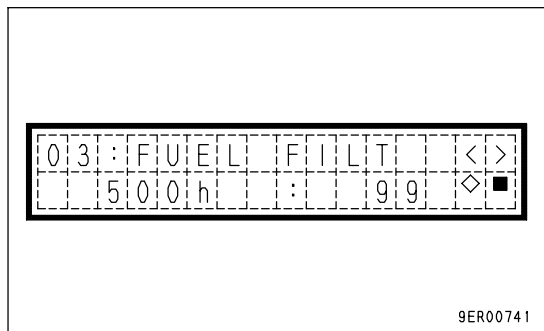
RESET METHOD FOR FILTER, OIL REPLACEMENT TIME

The filter and oil replacement time is displayed on the character display, so if the filter and oil have been replaced, reset the filter and oil change time.

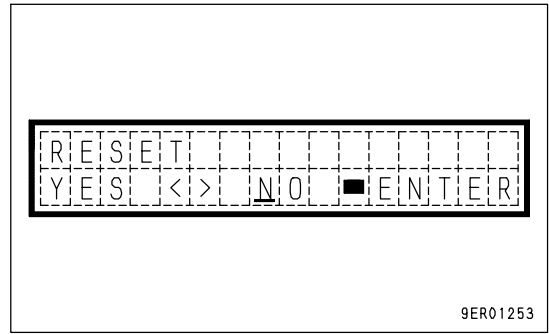
1. Press the (◇) of machine monitor mode selector switch 1, and display the reverse travel in odometer.
2. Press (>) or (<) of machine monitor mode selector switch 2 and display "MAINTENANCE MONITOR".



3. Press the (◇) of machine monitor mode selector switch 1. It will change to the display in the diagram on the right. The bottom line shows two items: the replacement time on the left and the total number of times the item has been replaced on the right.
4. Press (>) or (<) of machine monitor mode selector switch 2 and display the item to be reset.



5. Press the (◇) of machine monitor mode selector switch 1. It will change to the display in the diagram on the right.
The top line shows [Reset] and [Item to be reset] in turn.
6. When resetting the replacement time, press (>) or (<) of machine monitor mode selector switch 2, align the cursor with "YES", then press (■) of machine monitor mode selector switch 1. It will reset and returned to the previous screen.
To abandon, align the cursor with "NO", then press (■) of machine monitor mode selector switch 1.

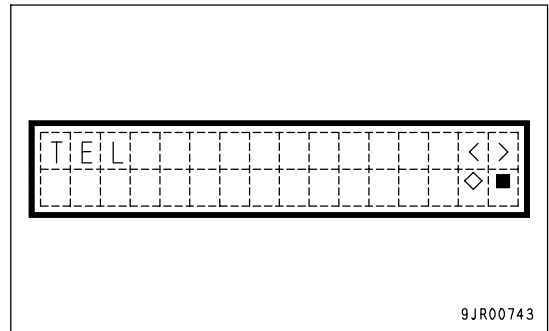


7. When resetting the replacement time for another item, carry out the procedure from Step 4. After completing, press (■) of machine monitor mode selector switch 1 twice or turn the starting switch OFF.

INPUT METHOD FOR TELEPHONE NUMBER

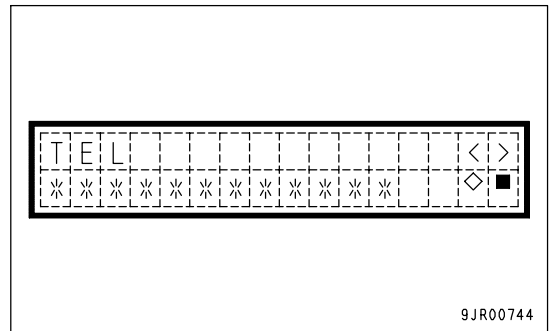
When an error for action code "E03" occurs, it is possible to display the telephone number.

1. Press the (◇) of machine monitor mode selector switch 1 and display the reverse travel odometer.
2. Press (>) or (<) of machine monitor mode selector switch 2 and display "TEL".



3. Press (◇) of machine monitor mode selector switch 1. It will change to the display in the diagram on the right.

Once the telephone number is input, the input number will be displayed next time.



4. Up to 12 digits can be displayed for the telephone number. Input from the first digits.
The cursor is displayed at the input position. Press (>) or (<) of machine monitor mode selector switch 2 and display "0 - 9".
To leave a blank, select "**".

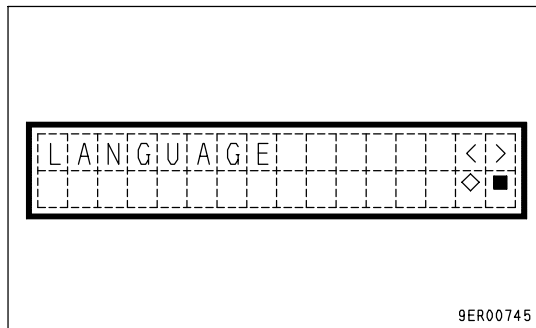
When the input value is decided, press (◇) of machine monitor mode selector switch 1. The cursor will move to the next position.

5. Repeat the procedure in Step 4 until the last digit. At the last digit, press (◇) of machine monitor mode selector switch 1 to return to the previous screen.
If there is a mistake in the input or the input is to be stopped, press (■) of machine monitor mode selector switch 1 to return to the previous screen.
6. When completing the operation, press (■) of machine monitor mode selector switch 1 twice or turn the starting switch OFF.

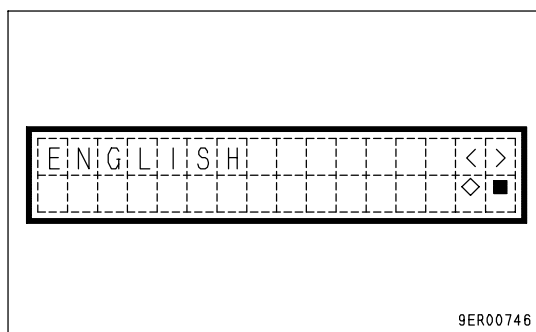
METHOD FOR SELECTING LANGUAGE

Use this when switching the language displayed on the character display.

1. Press the (◇) of machine monitor mode selector switch 1 and display the reverse travel odometer.
2. Press (>) or (<) of machine monitor mode selector switch 2 and display "LANGUAGE".



3. Press the (◇) of machine monitor mode selector switch 1. The presently selected language is displayed.
4. Press (>) or (<) of machine monitor mode selector switch 2 and select the language.

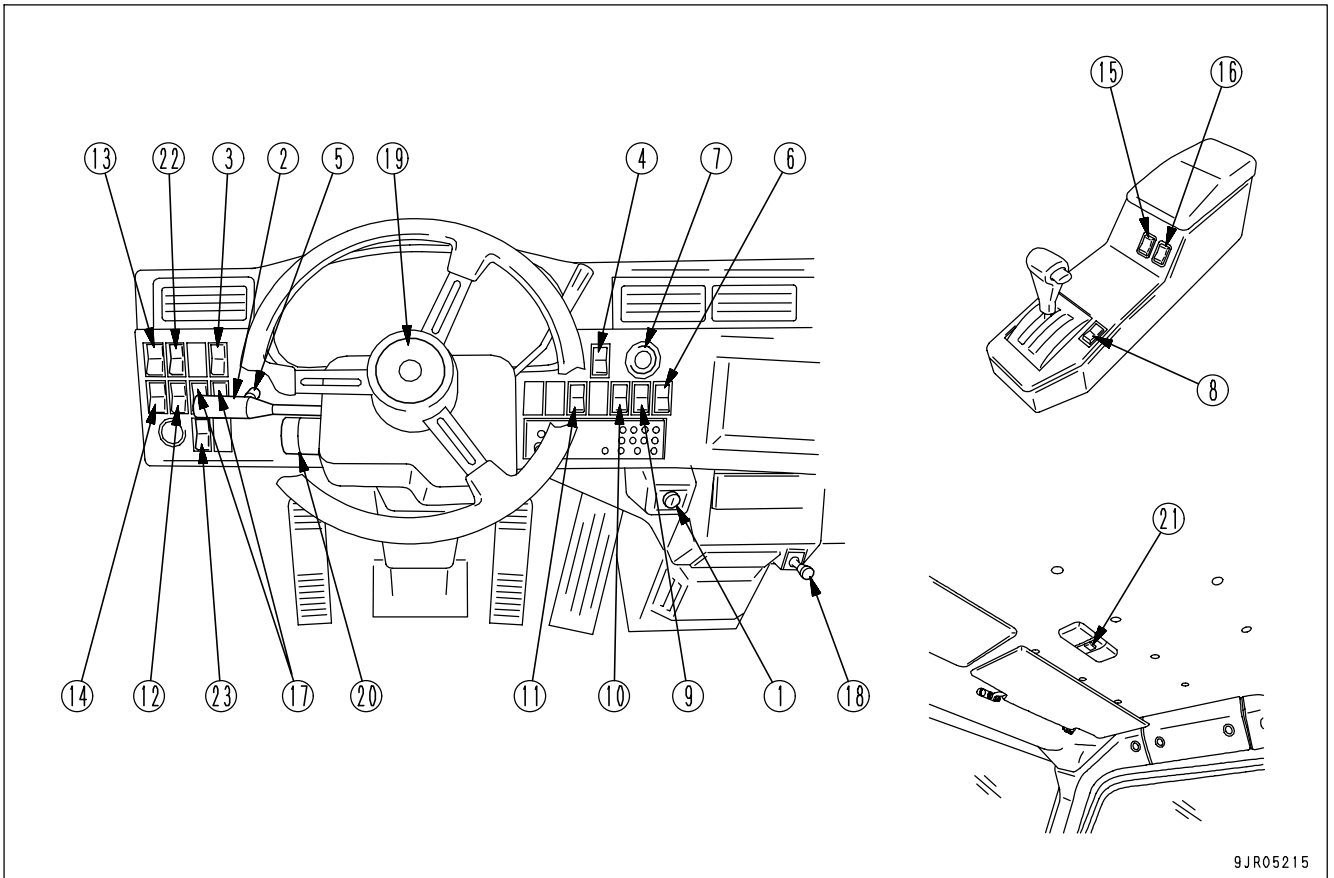


The available languages are English, Japanese, German, French, Italian, Spanish, and Swedish.

Language	Display
English	ENGLISH
Japanese	日本語
German	DEUTSCH
French	FRANCAIS
Italian	ITALIANO
Spanish	Español
Swedish	SVENSKA

5. When the (◇) of machine monitor mode selector switch 1 is pressed, the language is set and the screen returns to the previous screen.
6. When completing the operation, press (■) of machine monitor mode selector switch 1 twice or turn the starting switch OFF.

SWITCHES



9JR05215

- | | |
|---|--|
| (1) Starting switch | (13) Side lamp switch(if equipped) |
| (2) Lamp switch, Turn signal lever, Dimmer switch | (14) Yellow rotating lamp switch(if equipped) |
| (3) Machine monitor bulb check switch | (15) Power window switch (right) |
| (4) Hazard lamp switch | (16) Power window switch (left) |
| (5) Night lighting dimmer switch | (17) Machine monitor mode selector switch 1, 2 |
| (6) Power mode selector switch | (18) Cigarette lighter |
| (7) Emergency steering switch | (19) Horn button |
| (8) Parking brake switch | (20) Wiper, window washer switch |
| (9) AISS LOW switch | (21) Room lamp switch |
| (10) Front brake cut-off switch | (22) Switch for front window glass with heated wire (defrosting glass) (if equipped) |
| (11) Auto retarder (ARSC) switch | (23) Switch for mirror with heater (if equipped) |
| (12) Fog lamp switch (if equipped) | |

STARTING SWITCH

This switch (1) is used to start or stop the engine.

OFF position :

At this position, the starting switch key can be inserted or removed. When the key is turned to this position, all the electric circuits are switched off and the engine stops.

ON position :

In this position, electric current flows in the charging and lamp circuits.

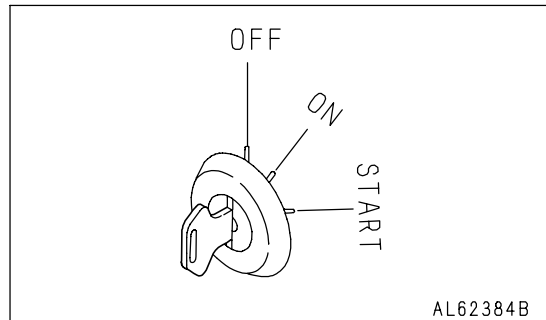
Keep the starting switch key at the ON position while the engine is running.

When turning the starting switch ON or OFF, if the starting switch is held at a position between ON and OFF, the controller may detect this as a problem. If this happens, return the starting switch to the OFF position, then operate it as usual to the ON position.

In cold weather, if the starting switch is turned to the ON position, pre-heating is automatically started and the engine pre-heating pilot lamp lights up. After the pre-heating is completed, the engine pre-heating pilot lamp goes out.

START position :

This is the position to start the engine. Hold the key at this position while cranking. Release the key immediately after the engine has been started. The key will return to the ON position when released.



AL62384B

LAMP SWITCH

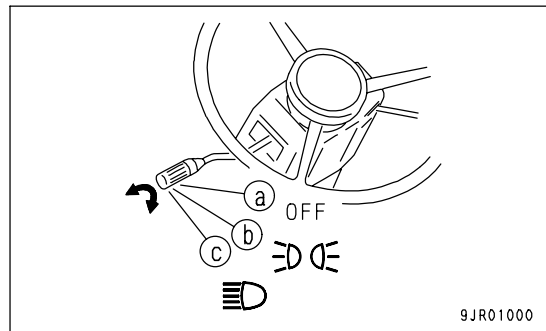
This switch (2) lights up the head lamps, side clearance lamps, tail lamps, machine monitor lighting, and rear lamps.

Position (a): OFF

Position (b): Side clearance lamps, tail lamps, rear lamps, and machine monitor lighting light up

Position (c): Front lamps light up in addition to lamps at position (b)

The lamp switch can be operated regardless of the position of the lever.



9JR01000

TURN SIGNAL LEVER

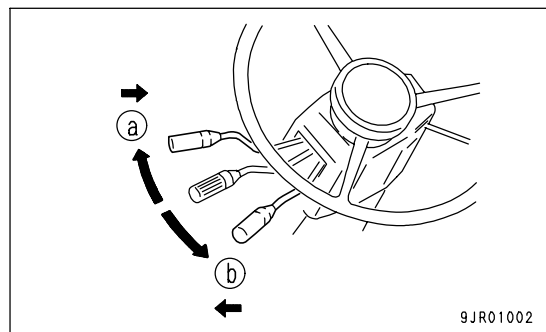
This switch (2) is used to operate the turn signal lamp.

(a) Right turn: Push the lever forward

(b) Left turn: Pull the lever back

When the lever is operated, the pilot lamp turn signal pilot lamp also flashes.

When the steering wheel is turned back, the lever automatically returns to its original position. If it does not return, return it by hand.



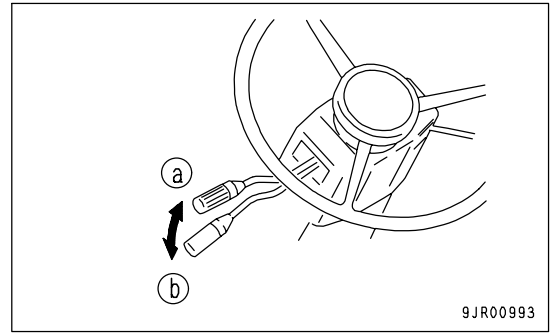
9JR01002

DIMMER SWITCH

This switch (2) is used to switch the head lamps between high beam and low beam.

Each time switch (2) is moved up in direction (a), the head lamps switch between high beam and low beam. When the switch is released, it automatically returns to its original position (b).

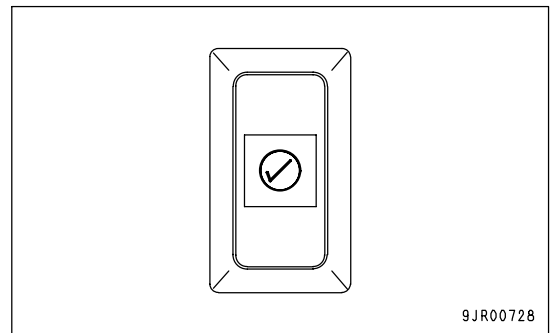
When the lamp switch is OFF, if the switch is operated in direction (a), the head lamps light up at the high beam position.



9JR00993

MACHINE MONITOR BULB CHECK SWITCH

Turn the starting switch ON, press this switch (3) and check for any blown bulbs.



9JR00728

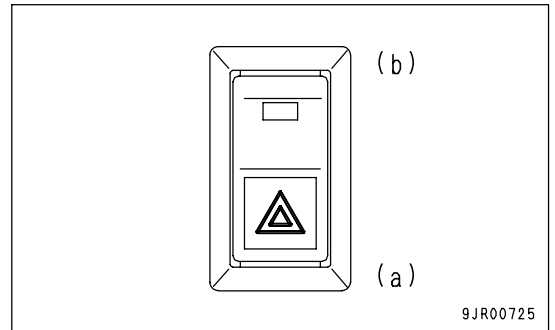
HAZARD LAMP SWITCH

This switch (4) is used to make the left and right turn signal indicators flash.

(a): OFF

(b): Turn signal lamp and turn signal pilot lamp flash

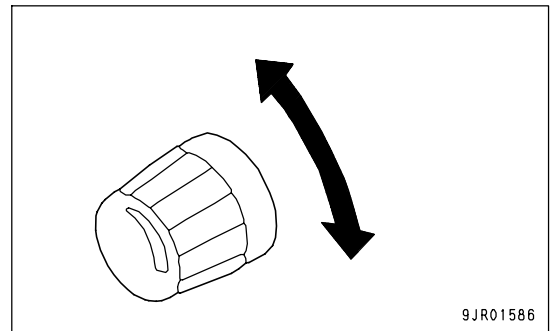
When working at night, the symbol inside the switch lights up regardless of the selected position of the switch.



9JR00725

NIGHT LIGHTING DIMMER SWITCH

This switch (5) is used to adjust the brightness of the lighting inside the machine monitor and the pilot lamp display. Turn it to the right to make the display brighter; turn it to the left to make the display dimmer.



9JR01586

POWER MODE SELECTOR SWITCH

This switch (6) is used to switch the power mode. This makes it possible to travel economically in a way suited to the operating conditions.

If portion (a) of the switch is pressed, high-power mode pilot lamp (P) lights up and the system is switched to the high-power mode.

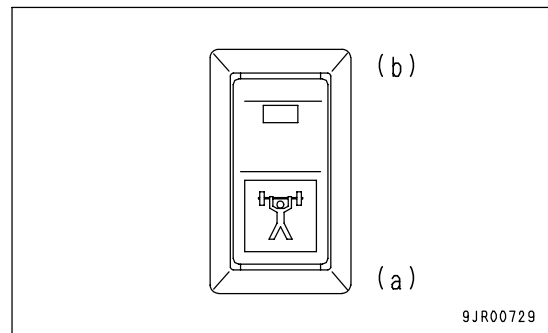
If portion (b) of the switch is pressed, economy mode pilot lamp (E) lights up and the system is switched to the economy mode.

(a): High power mode (general operations)

Normal standard operating conditions

(b): Economy mode (operations on flat ground)

Work with emphasis on fuel consumption, such as work on flat ground where the maximum power is not needed



When working at night, the symbol inside the switch lights up regardless of the selected position of the switch.

EMERGENCY STEERING SWITCH

This switch (7) is used to actuate the emergency steering pump.

When the switch is pressed, the emergency pump is actuated to make it possible to operate the steering.

When the switch is ON, the pilot lamp (red) inside the switch and the pilot lamp on the machine monitor light up.

The emergency steering pump can be used for a maximum of 90 seconds.

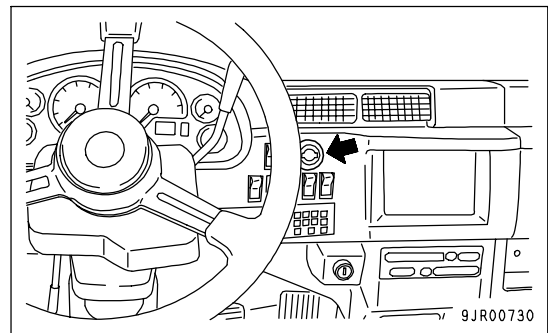
When the emergency steering is being used, keep the travel speed to a maximum of 5 km/h (3.1 MPH).

On machines equipped with auto emergency steering, the auto emergency steering is actuated automatically in the following cases.

- When the steering hydraulic pump fails
- When the engine has stopped during operation

When the emergency steering is actuated, stop the machine promptly and perform inspection.

If the starting switch is at the ON position and the parking brake switch is at the TRAVEL position when the machine is stopped, the automatic emergency steering is actuated after 1 second, so set the parking brake switch to the PARKING position.



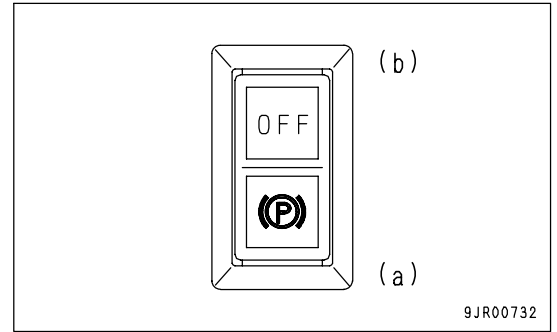
PARKING BRAKE SWITCH

 **WARNING**

When parking or leaving the machine, always apply the parking brake.

This switch (8) is used to actuate and release the parking brake valve.

- (a): Parking
The parking brake is applied.
- (b): Travel
The parking brake is released.



When the switch is set to the PARKING position, the parking brake pilot lamp lights up.

When the switch is set to the PARKING position, if the shift lever is at any position other than N, the central warning lamp will flash and the alarm buzzer will sound.

If any problem occurs in the brake circuit and the pressure in the accumulator goes down, the emergency brake is automatically applied.

For details of the method of releasing the emergency brake, see "WHEN PARKING BRAKE HAS BEEN ACTUATED IN EMERGENCY (PAGE 3-128)".

When working at night, the symbol inside the switch lights up regardless of the selected position of the switch.

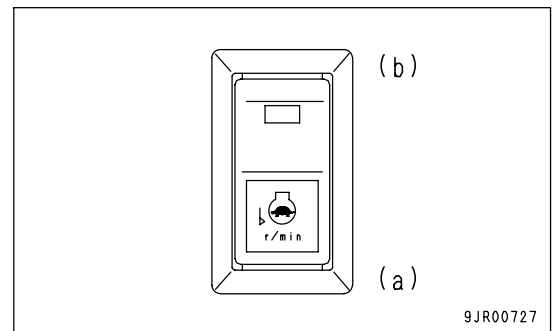
REMARK

If the engine is stopped with the parking brake switch at TRAVEL or the parking brake is operated mistakenly to TRAVEL while the engine is stopped, when the engine is started again, the parking brake is applied even though the parking brake switch is at TRAVEL. In this case, after starting the engine, operate the parking brake switch to PARKING and then back to TRAVEL to cancel the parking brake.

AISS LOW SWITCH

Using this switch (9), it is possible to switch the AISS freely between AUTO and LOW. Use each position as follows.

- (a): AUTO position
For normal operations
- (b): LOW position
When fine control of the machine is needed, such as when putting it into a garage.



If the switch is at AUTO position:

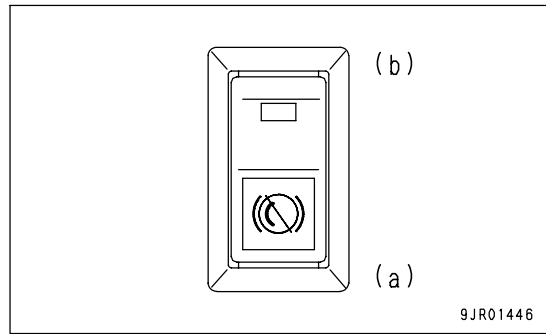
- If the parking brake or retarder brake are operated, the idle is automatically adjusted to low speed. When the parking brake and retarder brake are released, the idle is automatically adjusted to high speed.
- The water temperature is detected, and when it is at low temperature, the idle is automatically adjusted to high speed to reduce the warming-up time.

When working at night, the symbol inside the switch lights up regardless of the selected position of the switch.

FRONT BRAKE CUT-OFF SWITCH

WARNING

- When traveling on icy roads, on snow, or on other slippery road surfaces, set the front brake cut-off switch to the (b) position and travel slowly at a safe speed.
- If the front brake cut-off switch is set to the (a) position when traveling on icy road, on snow, or on other slippery road surfaces, there is danger that the steering will be impossible to control.



This switch (10) can be used to switch the braking method of according to the road surface conditions. If the (b) portion of the switch is pressed, the front brake cut function is actuated, and the front wheel brakes are not applied.

- (a): When the brake pedal is depressed, the brakes are applied to both the front and rear wheels.
- (b): When the brake pedal is depressed, the front brakes are not applied. The brakes are applied only to the rear wheels.

REMARK

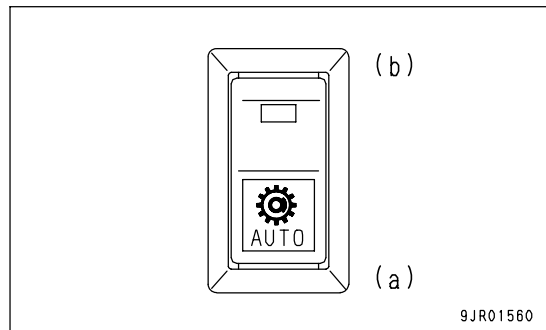
When the emergency brake is actuated, the front wheel brakes and the parking brake are actuated regardless of the position of the front brake cut-off switch.

When working at night, the symbol inside the switch lights up regardless of the selected position of the switch.

AUTO RETARDER (ARSC) SWITCH

This switch (11) is used to turn the auto retarder (ARSC) system ON/OFF.

- (a): Auto retarder (ARSC) system OFF
- (b): Auto retarder (ARSC) system ON



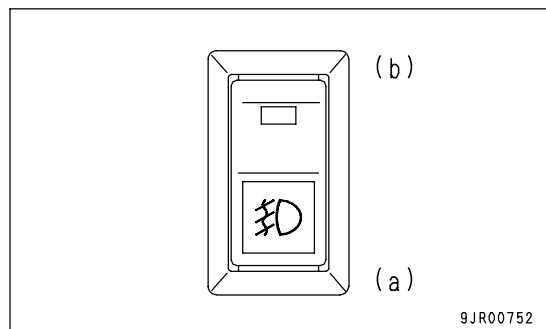
FOG LAMP SWITCH

(If equipped)

This switch (12) is used to switch on the fog lamp.

- (a): Fog lamp goes out
- (b): Fog lamp lights up

When working at night, the symbol inside the switch lights up regardless of the selected position of the switch.



SIDE LAMP SWITCH

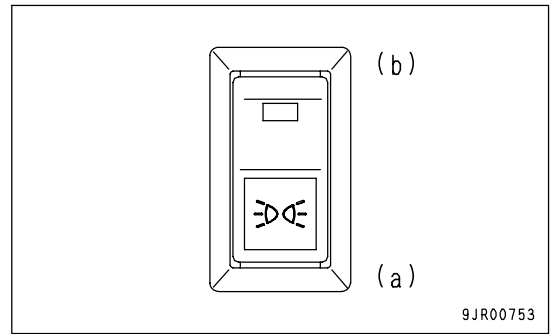
(If equipped)

This switch (13) is used to switch on the side lamp.

(a): Side lamp goes out

(b): Side lamp lights up

When working at night, the symbol inside the switch lights up regardless of the selected position of the switch.



YELLOW ROTATING LAMP SWITCH

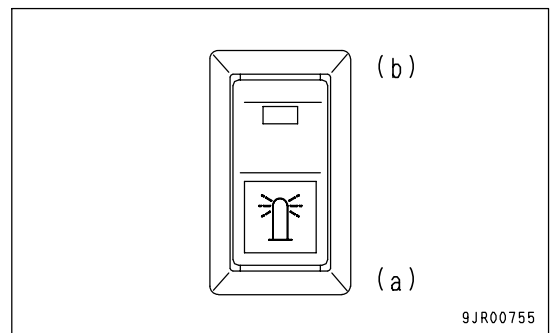
(If equipped)

This switch (14) is used to switch the yellow rotating lamp on and off. When the lamp is switched on, it lights up and rotates.

(a): Yellow rotating lamp goes out

(b): Yellow rotating lamp lights up

When working at night, the symbol inside the switch lights up regardless of the selected position of the switch.



POWER WINDOW SWITCH (RIGHT) (LEFT)

 **WARNING**

When closing the window glass, be careful not to get anyone's hands or head caught. There is danger of serious injury if anyone is caught in the window glass.

 **CAUTION**

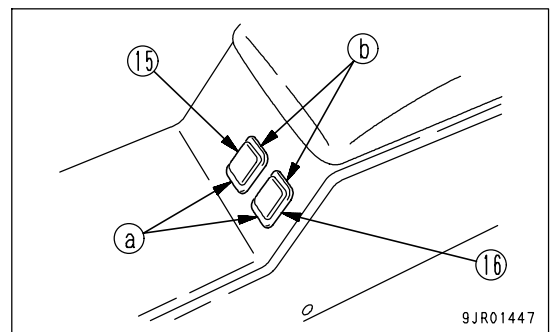
After fully opening or fully closing the window glass, do not keep the switch operated in the same direction. This may cause failure of the power window.

Switches (15) and (16) are used to open and close the window glass. The switches can only be used when the starting switch is at the ON position.

(a): Glass goes down

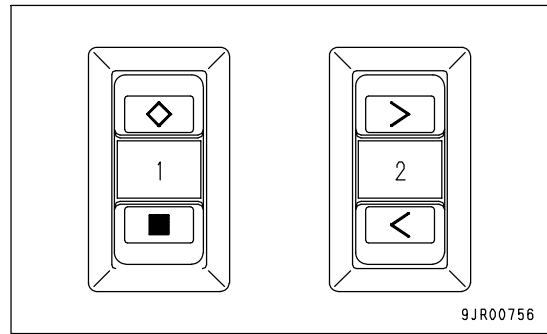
(b): Glass goes up

When the glass reaches the top or bottom and stops, release the switch.



MACHINE MONITOR MODE SELECTOR SWITCH 1, 2

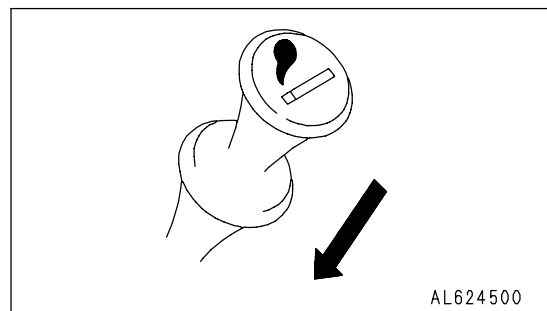
This switch (17) is used to operate the character display.



CIGARETTE LIGHTER

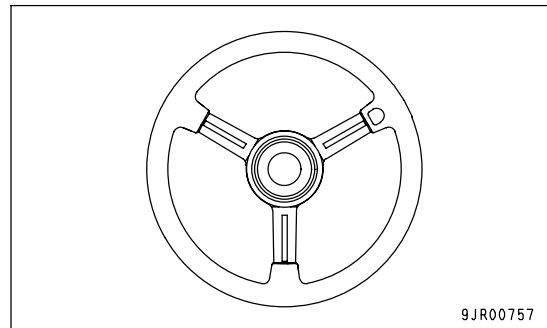
This switch (18) is used to light cigarettes.

When the cigarette lighter is pushed in, it will return to its original position after several seconds, then pull it out and use it to light your cigarette.



HORN BUTTON

When the horn button (19) in the center of the steering wheel is pressed, the horn will sound.



WIPER, WINDOW WASHER SWITCH

This switch (20) is used to operate the wiper for the front glass. Using the wiper when the glass is dry will scratch the glass. Spray with window washer fluid before actuating the wiper.

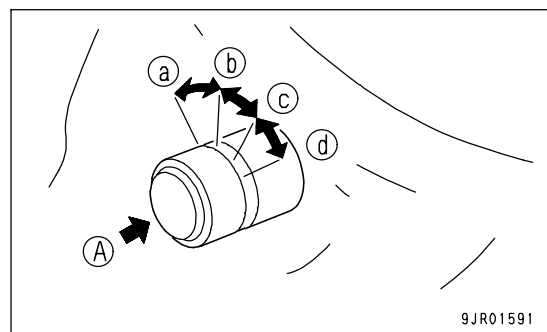
Front wiper

Position (a) (OFF): Stopped

Position (b) (INT): Wiper moves once every 4 - 7 seconds

Position (c) (LOW): Wiper moves at low speed

Position (d) (Hi): Wiper moves at high speed



When the button (A) at the tip of the switch is pressed, washer fluid is sprayed out.

Do not keep the button pressed for more than 10 seconds.

ROOM LAMP SWITCH

The switch (21) is used to turn the room lamp ON and OFF.

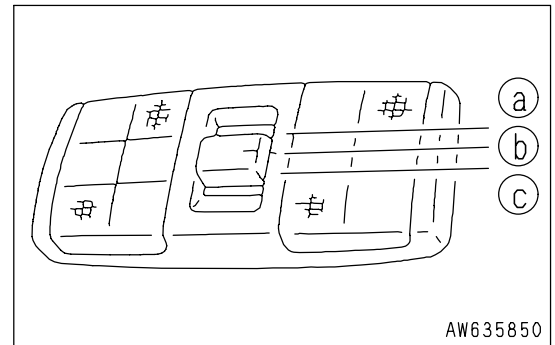
Position (a): OFF

Position (b): Lights up when the door opens

Position (c): Lights up

REMARK

- The room lamp lights up even when the main switch is OFF, so when leaving the operator's seat, set the switch to position (a) or (b).
- When carrying out operations with the door fully opened, set the switch to position (a) (OFF).



AW635850

SWITCH FOR FRONT WINDOW GLASS WITH HEATED WIRE

(If equipped)

Use this switch (22) to turn the heater for the front glass ON/OFF.

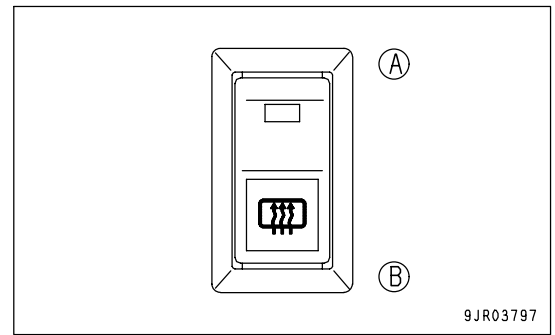
(A): Wire heater ON

(B): Wire heater OFF

When working at night, the symbol inside the switch lights up regardless of the selected position of the switch.

REMARK

The wire heater does not automatically turn OFF when it becomes hot, so when it is not needed, turn the switch manually to the OFF position.



9JR03797

SWITCH FOR MIRROR WITH HEATER

(If equipped)

Use this switch (23) to switch the left and right rear mirror heaters ON/OFF.

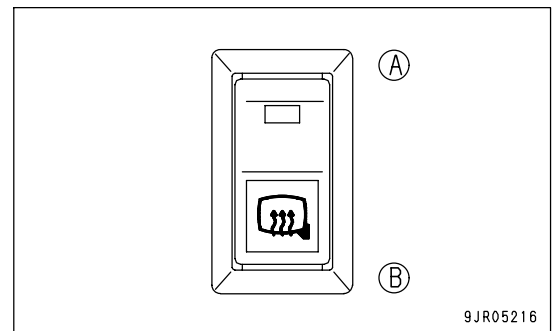
(A): Heater ON

(B): Heater OFF

When working at night, the symbol inside the switch lights up regardless of the selected position of the switch.

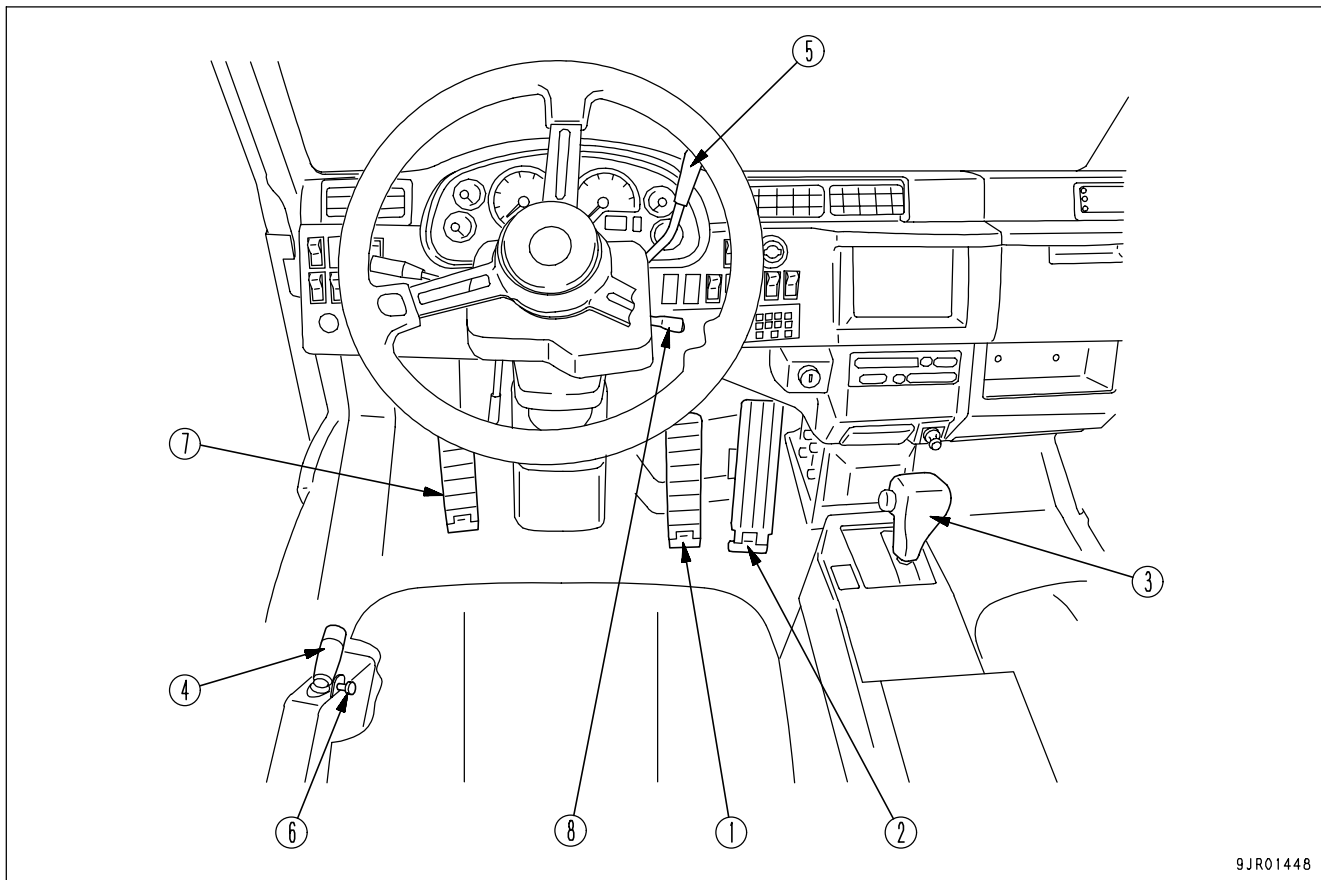
REMARK

The wire heater does not automatically turn OFF when it becomes hot, so when it is not needed, turn the switch manually to the OFF position.



9JR05216

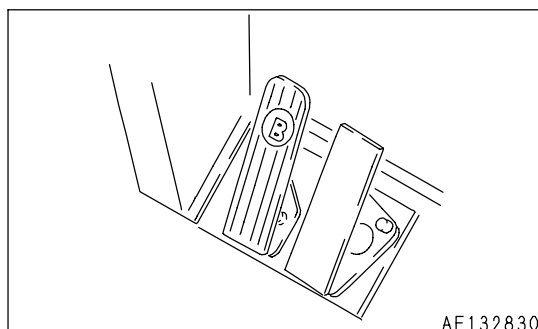
CONTROL LEVERS AND PEDALS



- | | |
|-----------------------|------------------------------------|
| (1) Brake pedal | (5) Retarder control lever |
| (2) Accelerator pedal | (6) Safety lock knob |
| (3) Gear shift lever | (7) Emergency brake pedal |
| (4) Dump lever | (8) Auto retarder (ARSC) set lever |

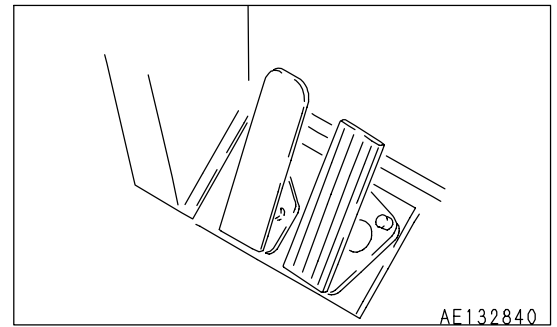
BRAKE PEDAL

This pedal (1) is used to apply the wheel brakes.



ACCELERATOR PEDAL

This pedal (2) is used to adjust the engine speed. It can be operated freely between the engine low idle position and the full throttle position.

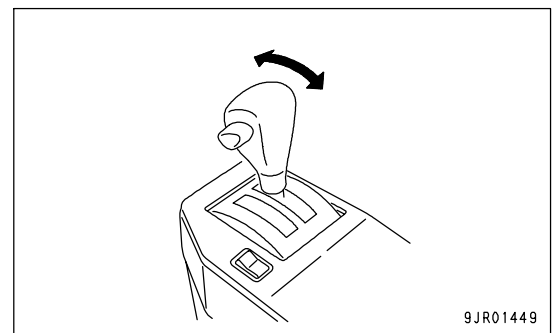


GEAR SHIFT LEVER

The gear range can be selected with this lever (3) to match the travel conditions.

D position:

This is used for normal travel. If the lever is placed in this position, the transmission is shifted automatically from 2nd torque converter drive to 7th speed to match the travel speed of the machine. If the dump body is raised, the shift lever is fixed at 2nd. Always lower the dump body when traveling. The maximum speed in this position is 70.0 km/h (43.5 MPH).



R position:

This is used when traveling in reverse. This position uses the torque converter drive. The maximum travel speed in this position is 12.0 km/h (7.5 MPH).

It is impossible to travel in reverse if the dump body is raised. Lower the dump body, set the dump lever to the "FLOAT" position, then set the gearshift lever to the "R" position.

6 - L position:

These positions are used in places where it is difficult to travel at high speed, or when traveling on soft ground, or when starting the machine off on a slope when it is loaded. They are also used when going downhill if it is needed to use the braking force of the engine. If the dump body is raised, it is impossible to shift up from 1st. Always lower the dump body when traveling.

- The speed ranges for each position are as follows.

Position	Speed range	Max. speed [km/h (MPH)]
6	1st torque converter - 6th direct	52.5 (32.6)
5	1st torque converter - 5th direct	39.0 (24.2)
4	1st torque converter - 4th direct	29.5 (18.3)
3	1st torque converter - 3rd direct	21.5 (13.4)
2	1st torque converter - 2nd direct	16.0 (9.9)
L	1st torque converter - 1st direct	11.5 (7.1)

When operating the shift lever, be sure to set it in position securely.

If the lever is not placed in position properly, the shift position display on the panel may go out and the Transmission system caution lamp may light up.

Before shifting between forward and reverse, stop the machine completely and then run the engine at low idle.

When starting the engine, if the shift lever is not at the N (neutral) position, the engine will not start.

When the starting switch is at the ON position, if the shift lever is not at the N (neutral) position, the shift lever position pilot lamp will flash, the central warning lamp will light up, and the alarm buzzer will sound.

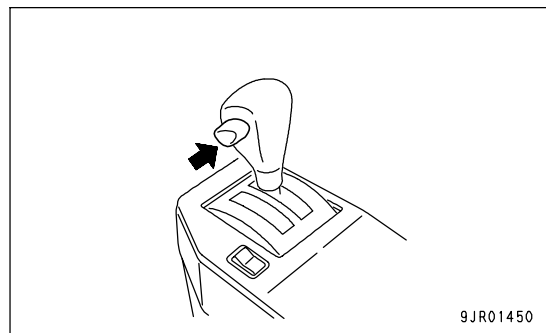
If the parking brake is applied or the shift lever is not at the N (neutral) position, the central warning lamp will light up and the alarm buzzer will sound.

If the shift lever is set to any position other than N (neutral) when the dump lever is at a position other than FLOAT or the body is still raised, the central warning lamp will light up and the alarm buzzer will sound.

The shift lever must not be returned to the N (neutral) position while traveling.

Release the accelerator pedal and run the engine at low idle when moving the shift lever from the N position to the forward or reverse position.

When moving the shift lever from the N (neutral) position to the R (reverse) position or from the D positions to position 6, press the lock button on the shift lever before moving it.



DUMP LEVER

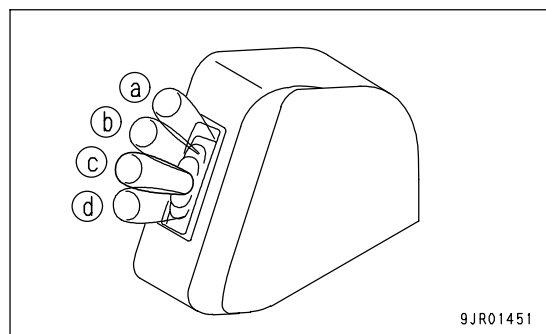
! CAUTION

To prevent damage to the dump body through vibration from the road surface, always lower the dump body before traveling.

This lever (4) is used to operate the dump body.

- (a) RAISE
- (b) HOLD: The dump body stops and is held in position.
- (c) FLOAT: The dump body moves freely under external force.
- (d) LOWER

Always set to the FLOAT position when traveling.



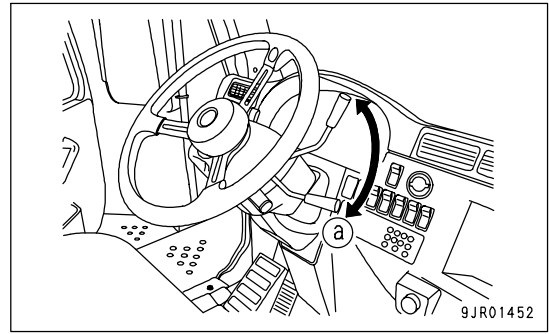
RETARDER CONTROL LEVER

CAUTION

The retarder must not be used as a parking brake.

Use this lever (5) to operate the retarder when traveling downhill. The more the lever is pulled in direction (a), the greater the braking force becomes.

When the retarder is operated, the retarder pilot lamp lights up.



When leaving the operator's seat, always apply the parking brake.

SAFETY LOCK KNOB

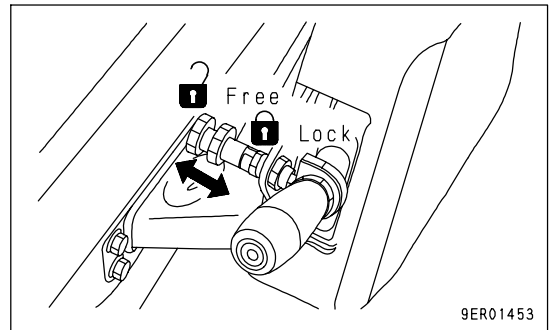
WARNING

When carrying out inspection of the machine with the dump body raised, always set the dump lever to the HOLD position, lock with the safety lock knob, then use the safety pin.

This device (6) is used to lock the dump lever.

To set to the FREE position, pull the lock knob up until it stops, then turn it to lock it in position.

To set to the LOCK position, pull the lock knob up, then turn it to release the lock. The knob will be pushed in by the force of the spring, and the lock will be applied. After doing this, check that the dump lever is locked.



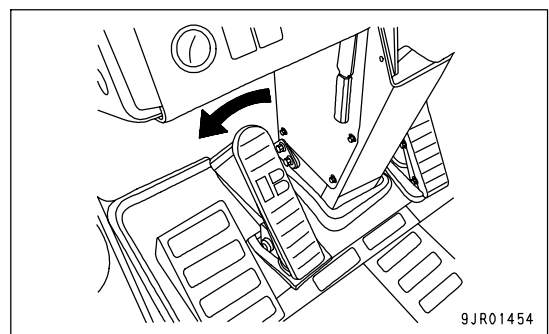
EMERGENCY BRAKE PEDAL

It is possible to apply the front brake and parking brake with this pedal (7).

Use it in emergencies, such as when the brake pedal system is damaged and the wheel brake has no effect.

REMARK

If the pressure in the accumulator goes down, the emergency brake is automatically applied. For details of the method of canceling the emergency brake, see "WHEN PARKING BRAKE HAS BEEN ACTUATED IN EMERGENCY (PAGE 3-128)".

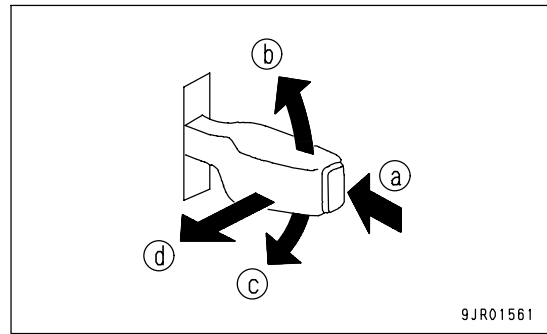


AUTO RETARDER (ARSC) SET LEVER

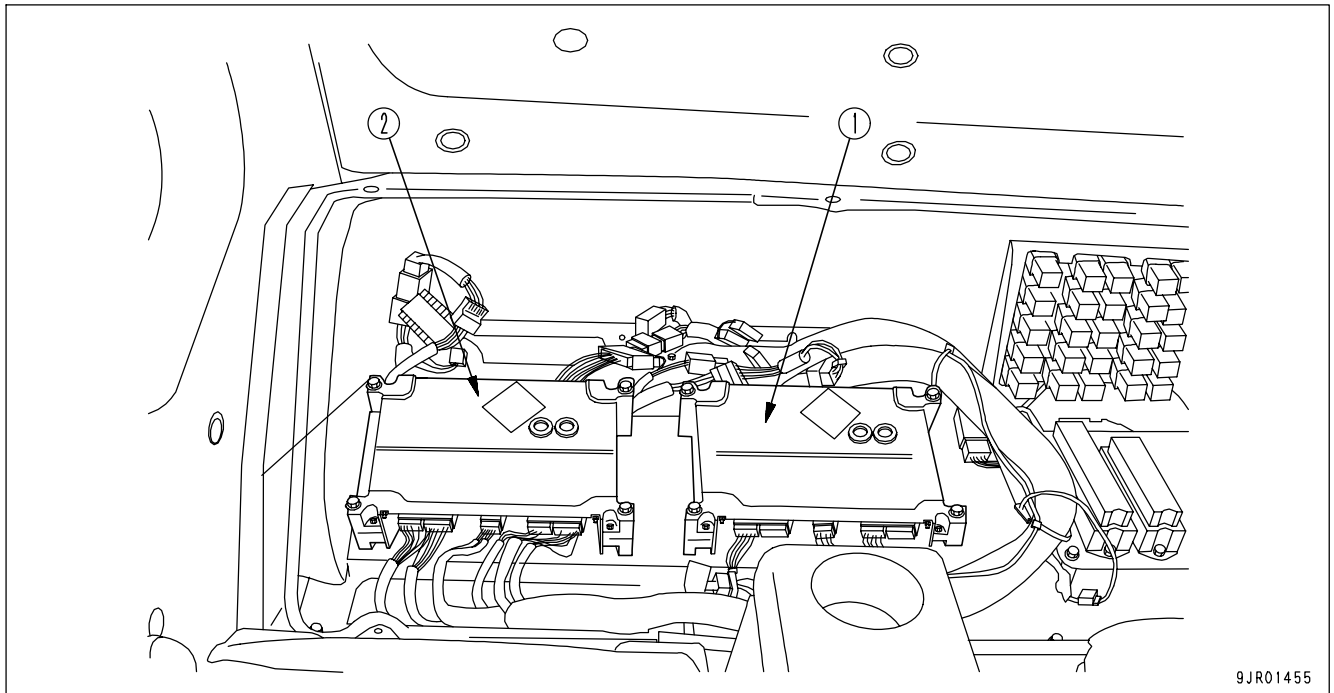
It is possible to use this lever (8) to set, cancel, or make fine adjustment of the ARSC set speed.

- (a) Set
- (b) Increase speed (tap up)
- (c) Decrease speed (tap down)
- (d) Cancel

For details of handling the ARSC, see "ARSC (AUTOMATIC RETARDER SPEED CONTROL) (PAGE 3-96)".



MECHATRONICS EQUIPMENT CONTROLLER



(1) Transmission controller

(2) Retarder controller

TRANSMISSION CONTROLLER

A 2-digit failure code is displayed in the inspection window of this controller (1) to show the location of the problem. When the condition is normal, "0.0", "0.L", "0.-", or "0.C" is displayed.

RETARDER CONTROLLER

A 2-digit failure code is displayed in the inspection window of this controller (2) to show the location of the problem. When the condition is normal, [0.0] is displayed.

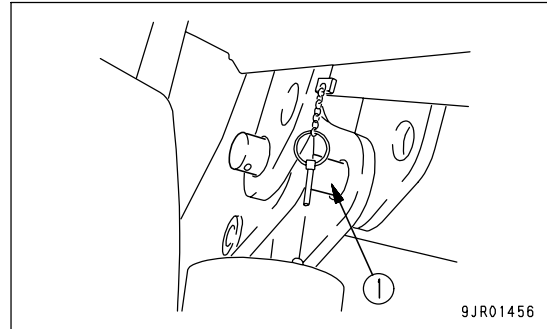
SAFETY PIN



WARNING

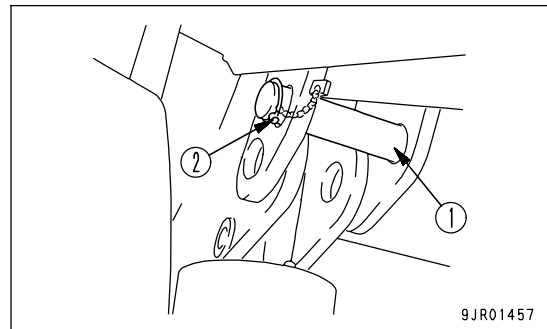
When carrying out inspection of the machine with the dump body raised, always set the dump lever to the HOLD position, lock with the safety lock knob, then use the safety pin.

This is a safety device for the dump body, and is used when carrying out inspection or maintenance with the dump body raised. Raise the dump body fully and insert safety pins (1). Always insert the safety pins on both the left and right sides.



STOWING SAFETY PIN

The safety pins are stored at the bottom rear of the dump body. Insert safety pins (1), then insert lock pins (2) to stow in position.

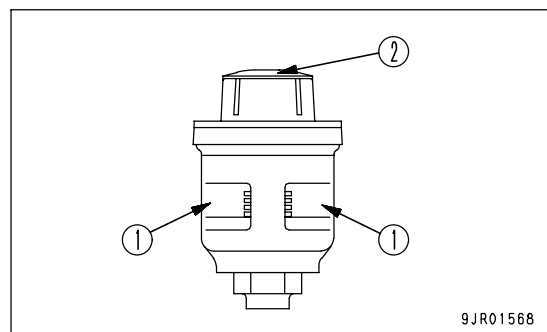


DUST INDICATOR

This device shows the clogging of the air cleaner.

Depending on the degree of clogging of the element, yellow display (1) appears in the transparent portion. If yellow display (1) indicates 7.5 kPa (0.076 kgf/cm², 1.1 PSI), clean the element immediately.

After cleaning, press top portion (2) of the indicator to return yellow display (1) to its original position.



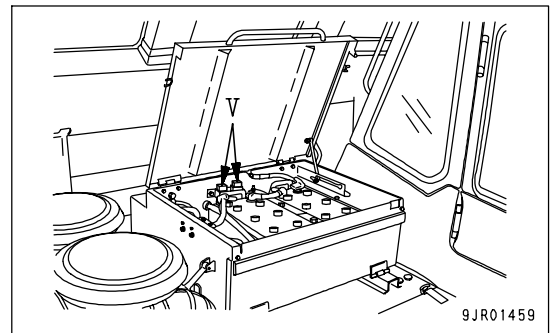
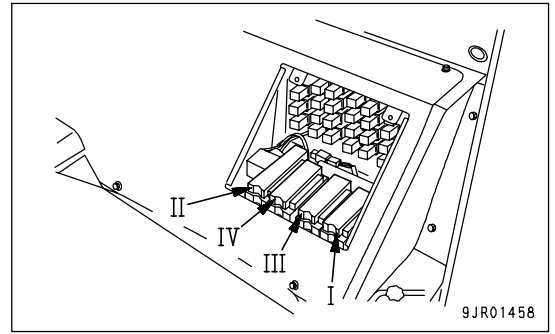
FUSES

The fuses protect the electrical equipment and wiring from burning out.

If the fuse becomes corroded, or white powder can be seen, or the fuse is loose in the fuse holder, replace the fuse.

NOTICE

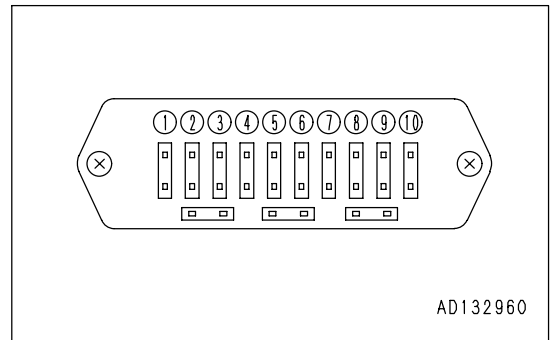
- When replacing any fuse, always turn the power off (turn the starting switch to OFF).
- When replacing the fuse, always use a fuse of the same capacity and type.



FUSE CAPACITY AND CIRCUIT NAME

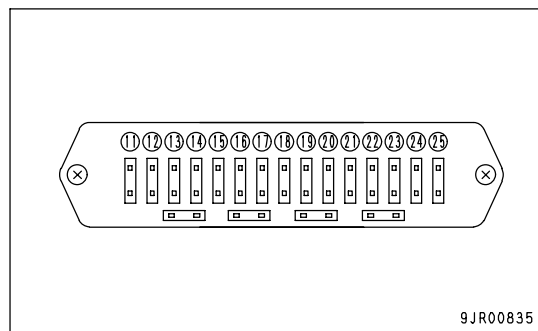
Fuse box I

No.	Capacity	Name of circuit
(1)	30A	Main lamp
(2)	10A	Turn signal indicator lamp
(3)	15A	Head lamp (high beam)
(4)	15A	Head lamp (low beam)
(5)	10A	Clearance lamp (right)
(6)	10A	Clearance lamp (left)
(7)	10A	Tail lamp
(8)	30A	Backup lamp, backup buzzer
(9)	20A	Air conditioner blower motor (if equipped)
(10)	20A	VHMS controller



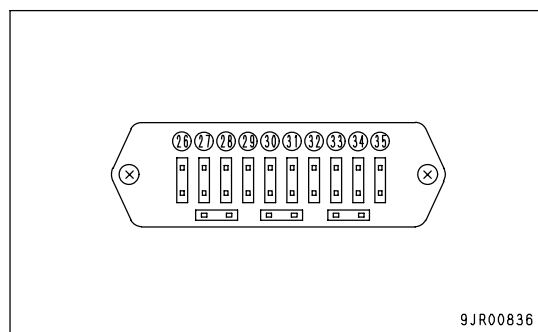
Fuse box II

No.	Capacity	Name of circuit
(11)	10A	Machine monitor
(12)	10A	Rear view monitor (if equipped)
(13)	10A	Engine controller
(14)	20A	Power window (left)
(15)	20A	Power window (right)
(16)	10A	Payload meter (if equipped), payload meter relay (if equipped)
(17)	20A	Payload external display lamp (if equipped)
(18)	20A	Wiper motor
(19)	20A	Spare
(20)	20A	Starting switch, radio (if equipped)
(21)	10A	Transmission controller, machine monitor panel
(22)	20A	Hazard lamp
(23)	10A	Emergency steering
(24)	5A	Room lamp
(25)	10A	Engine controller, VHMS controller



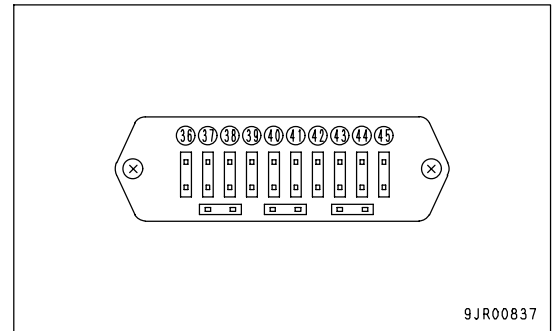
Fuse box III

No.	Capacity	Name of circuit
(26)	20A	Fog lamp (if equipped)
(27)	20A	Air conditioner controller (if equipped)
(28)	10A	Heater (if equipped)
(29)	20A	Heater (if equipped)
(30)	10A	Engine start relay, dump lever, shift lever
(31)	10A	Retarder controller
(32)	10A	Transmission controller
(33)	10A	Emergency steering, parking brake relay
(34)	10A	accumulator oil pressure sensor
(35)	10A	Radio



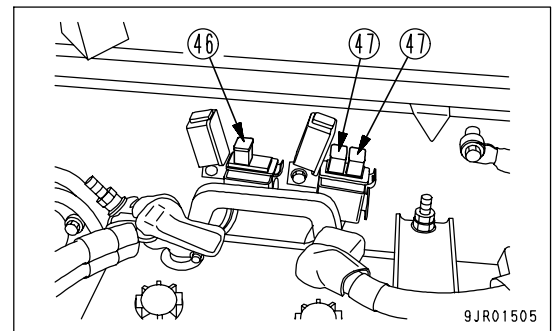
Fuse box IV

No.	Capacity	Name of circuit
(36)	10A	Room lamp
(37)	10A	Engine controller
(38)	15A	Yellow rotating lamp (if equipped)
(39)	20A	Side lamp (if equipped)
(40)	10A	Electric operator's seat heater (if equipped)
(41)	10A	Horn
(42)	10A	Tachograph (if equipped)
(43)	10A	Cigarette lighter
(44)	10A	Air suspension seat (if equipped)
(45)	10A	Engine controller



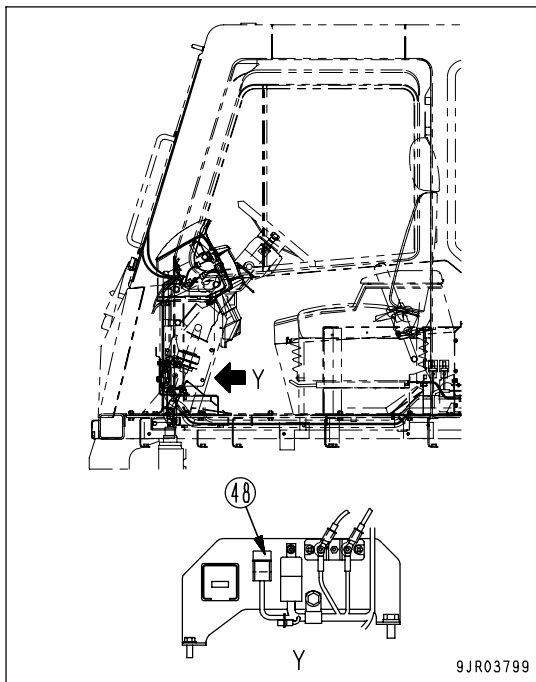
Fuse box V

No.	Capacity	Name of circuit
(46)	30A	Power source for fuse box
(47)	120A	Power source for engine heater



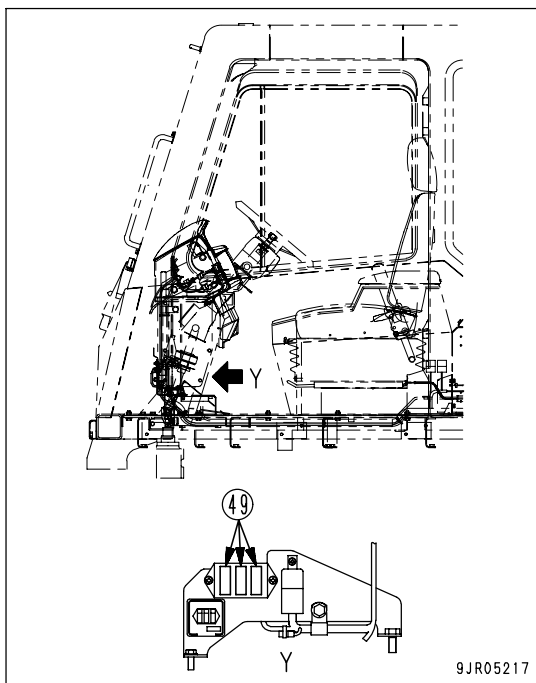
Fuse box etc.

No.	Capacity	Name of circuit
(48)	30A	For front glass with heated wire (if equipped)

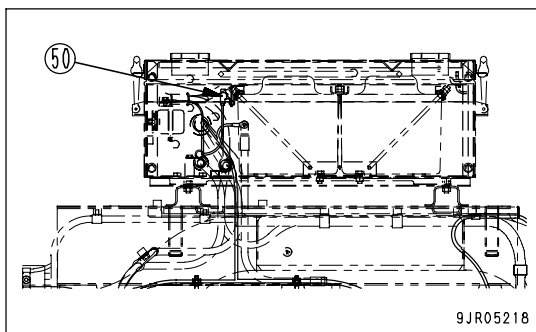


9JR03799

No.	Capacity	Name of circuit
(49)	10A	Mirror with heater (if equipped)
(50)	25A	Mirror with heater (if equipped)



9JR05217



9JR05218

Precautions when adding electrical equipment**CAUTION**

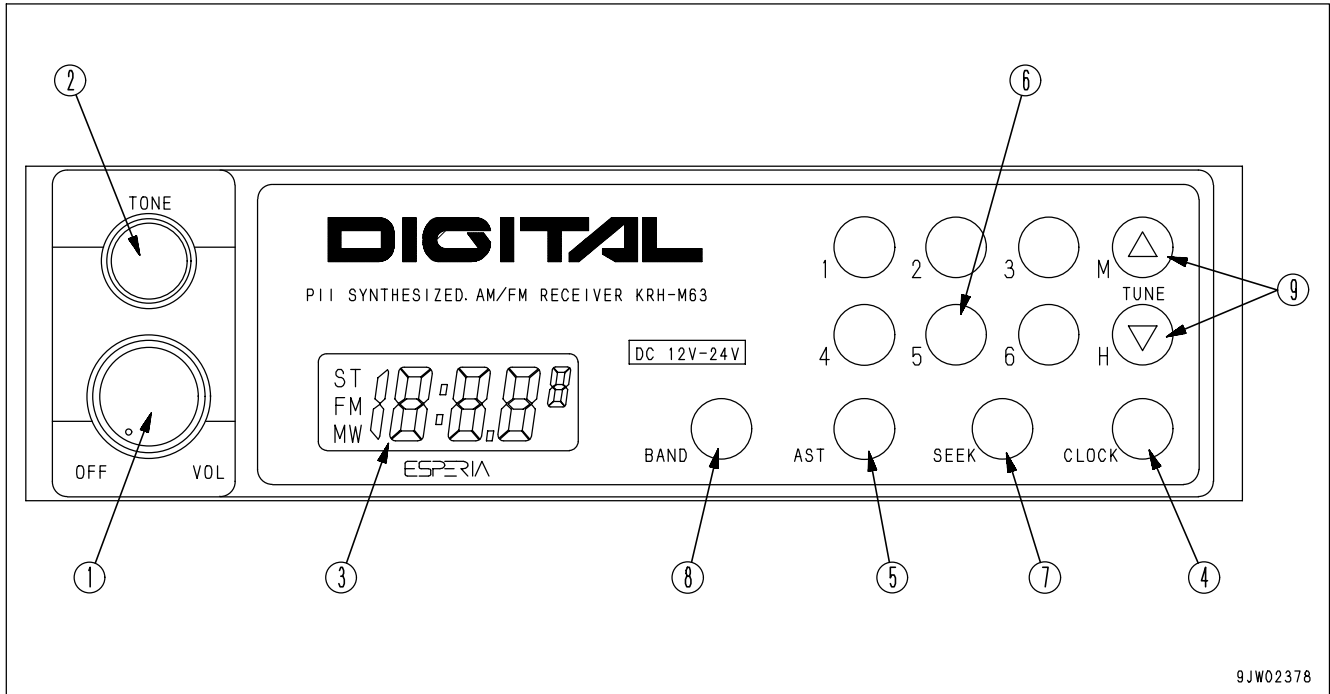
If the electrical equipment system is changed, problems may occur in the machine control. Do not make any changes to the electrical system.

If you want to make any change to the electrical system, please contact your Komatsu distributor.

CAR RADIO

(If equipped)

EXPLANATION OF COMPONENTS

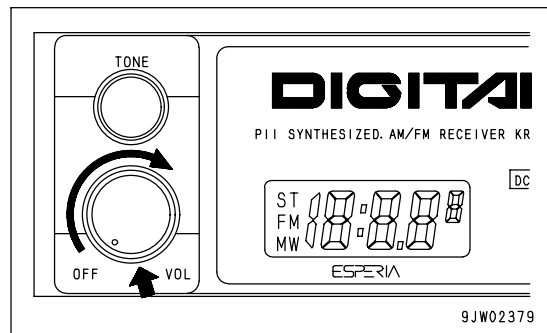


9JW02378

- | | |
|---------------------------------------|--------------------------|
| (1) Power switch/Volume | (6) Preset switch |
| (2) Tone control knob | (7) Seek |
| (3) Display | (8) Band selector switch |
| (4) Clock button/Displaying frequency | (9) Tuning switch |
| (5) AST | |

POWER SWITCH/VOLUME

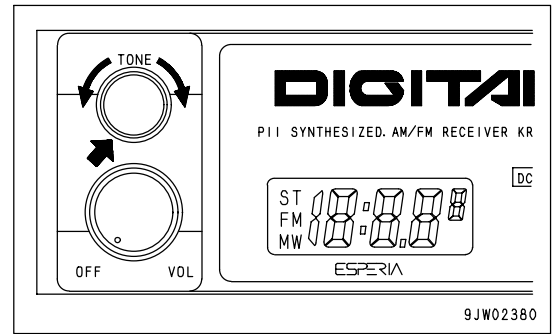
When this switch (1) is turned to the right, it clicks and the power is turned on. If it is turned further, the speaker volume is adjusted.



9JW02379

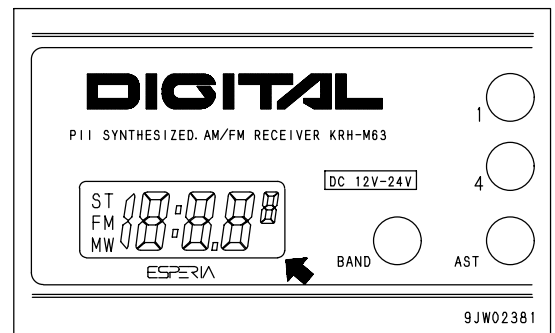
TONE CONTROL KNOB

If this knob (2) is turned to the right, the high tone is emphasized;
if it is turned to the left, the high tone is reduced.



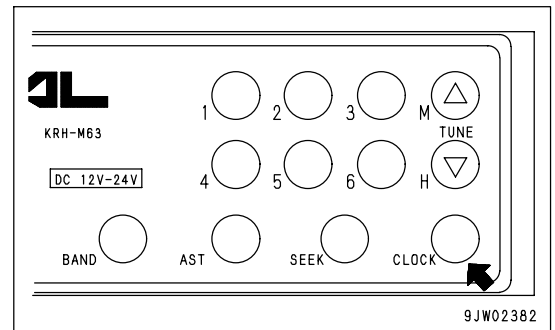
DISPLAY

This display (3) shows the radio reception frequency and the operating mode.



CLOCK BUTTON/DISPLAYING FREQUENCY

When this button (4) is pressed, the display changes to the time.
If it is pressed again, it displays the frequency.

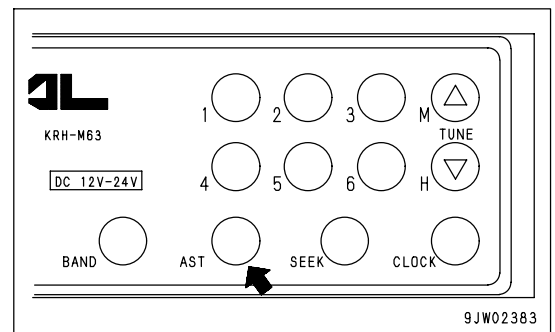


AST

When this button (5) is pressed, the preset stations are called up in turn.

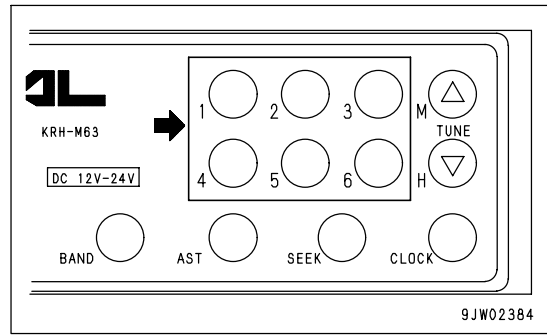
When the desired broadcasting station is reached, press the button again to stop it.

If the button is kept pressed continuously for 2 seconds, it is set to auto memory.



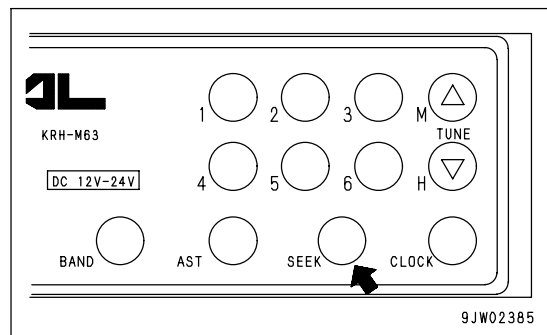
PRESET SWITCH

With this switch (6), each button can be set to one station each for FM and MW (AM). (For details of the method of resetting, see "METHOD OF PRESET (PAGE 3-54)".)



SEEK

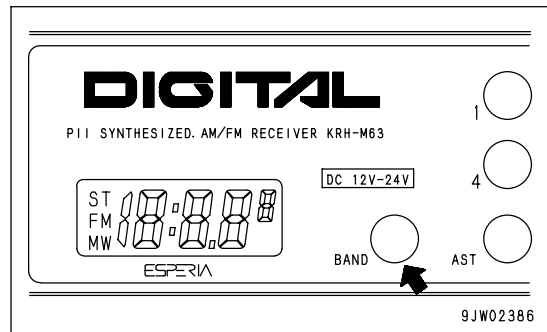
When this switch (7) ("SEEK") is pressed, it automatically searches for stations that can be received, and when it receives a station, it stops.



BAND SELECTOR SWITCH

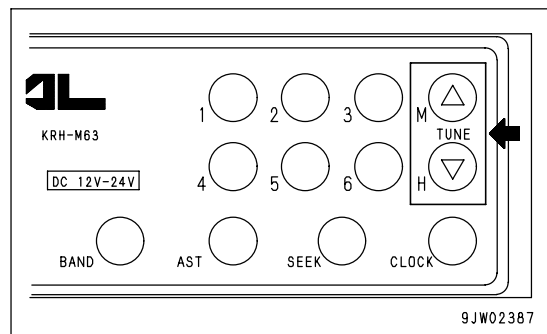
When this switch (8) ("BAND") is pressed, the band is switched between FM and MW (AM).

The reception band and frequency are displayed on the display.



TUNING SWITCH

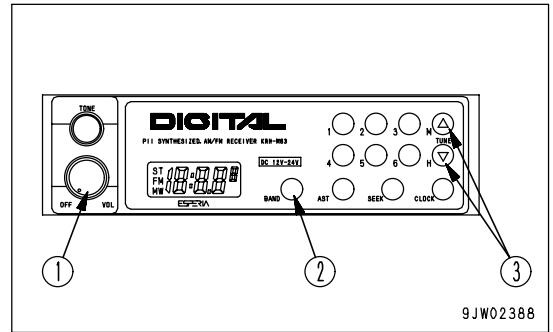
When the "TUNE" button Δ of switch (9) is pressed, the frequency goes up; when the ∇ button is pressed, the frequency goes down. If it is kept pressed, the frequency changes continuously.



METHOD OF OPERATION

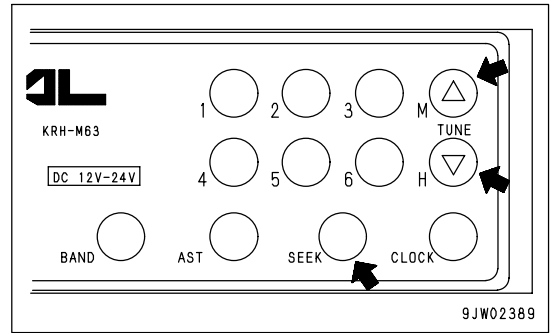
LISTENING TO RADIO

1. This switches on power (1) for the radio.
2. "BAND" switch (2) is used to select MW (AM) or FM.
3. Use the preset switch or tuning switch (3) to select the station.
4. Adjust the volume and tone as desired.
5. To turn the radio OFF, turn VOL knob (1) to the left until a click is heard.



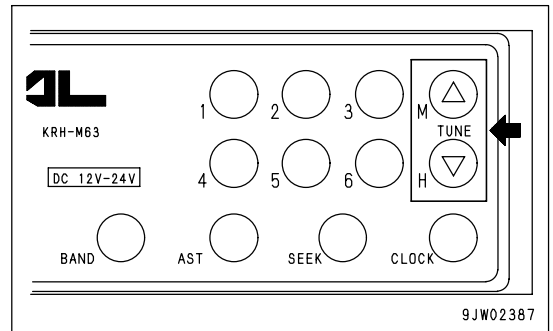
METHOD OF AUTOMATIC TUNING

When the "SEEK" switch is pressed, it moves up to higher frequencies and when it finds a station that can be received, it stops automatically.



METHOD OF MANUAL TUNING

When the TUNE button Δ is pressed, the frequency goes up; when the ∇ button is pressed, the frequency goes down. If it is kept pressed, the frequency changes continuously.



METHOD OF PRESET

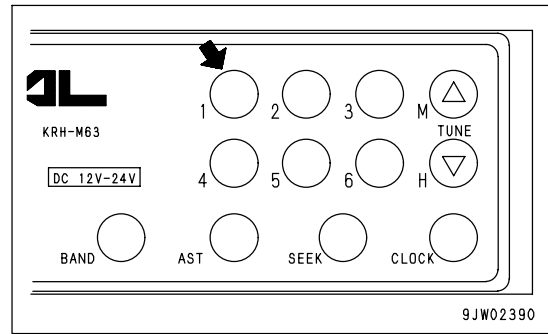
1. Select the desired preset station.

Use the "BAND" button to select MW (AM) or FM, and use the "TUNE" button to select the frequency of the broadcasting station.

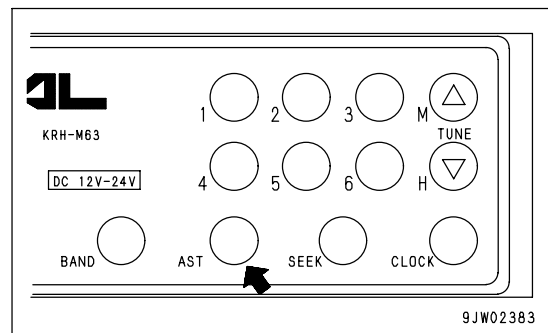
2. Decide the number of the button to be preset, and keep it pressed for 2 seconds. The number of the button will be displayed and the presetting is completed.

3. Repeat Steps 1 to 2 to preset other broadcasting stations.

- To change the setting of a preset switch to another station, repeat Steps 1 to 2.
- If the battery is replaced or the power is switched off, all the preset settings are deleted. Carry out the presetting operation again.
- It is possible to preset 6 AM (MW) stations and 6 FM stations.

**METHOD OF AUTOMATIC MEMORY**

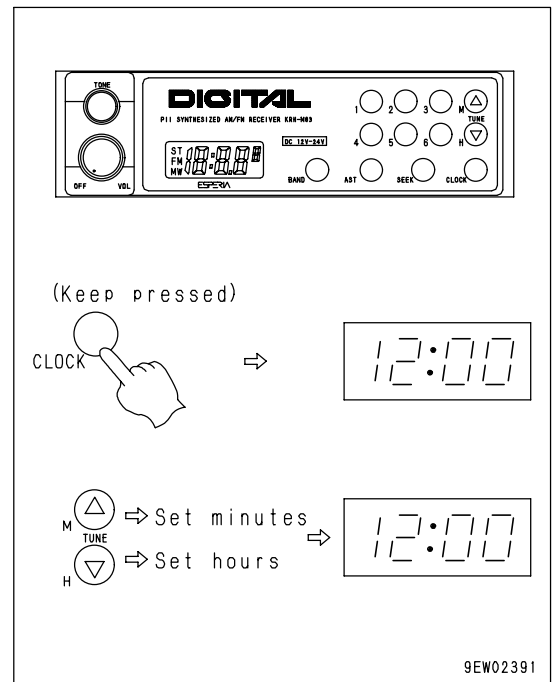
If the "AST" button is pressed for 2 seconds, the broadcasting stations that can be received in the area are called up in turn, and the broadcasting stations are automatically saved in the preset memory.

**AUTOMATIC SWITCHING RECEPTION OF MONAURAL/STEREO**

If the reception of the FM stereo broadcast being received is weak (when you are far from the broadcasting station or are surrounded by hills), the radio is automatically switched from stereo to monaural to reduce the interference. When the stereo broadcast becomes stronger, it automatically switches back to stereo broadcasting.

ADJUSTING TIME

1. Turn the radio power ON. If the display shows the frequency, set the CLOCK button to the time display.
2. To set the time, keep the CLOCK button pressed and
 Press the Δ button to change the minutes
 Press the ∇ button to change the hours



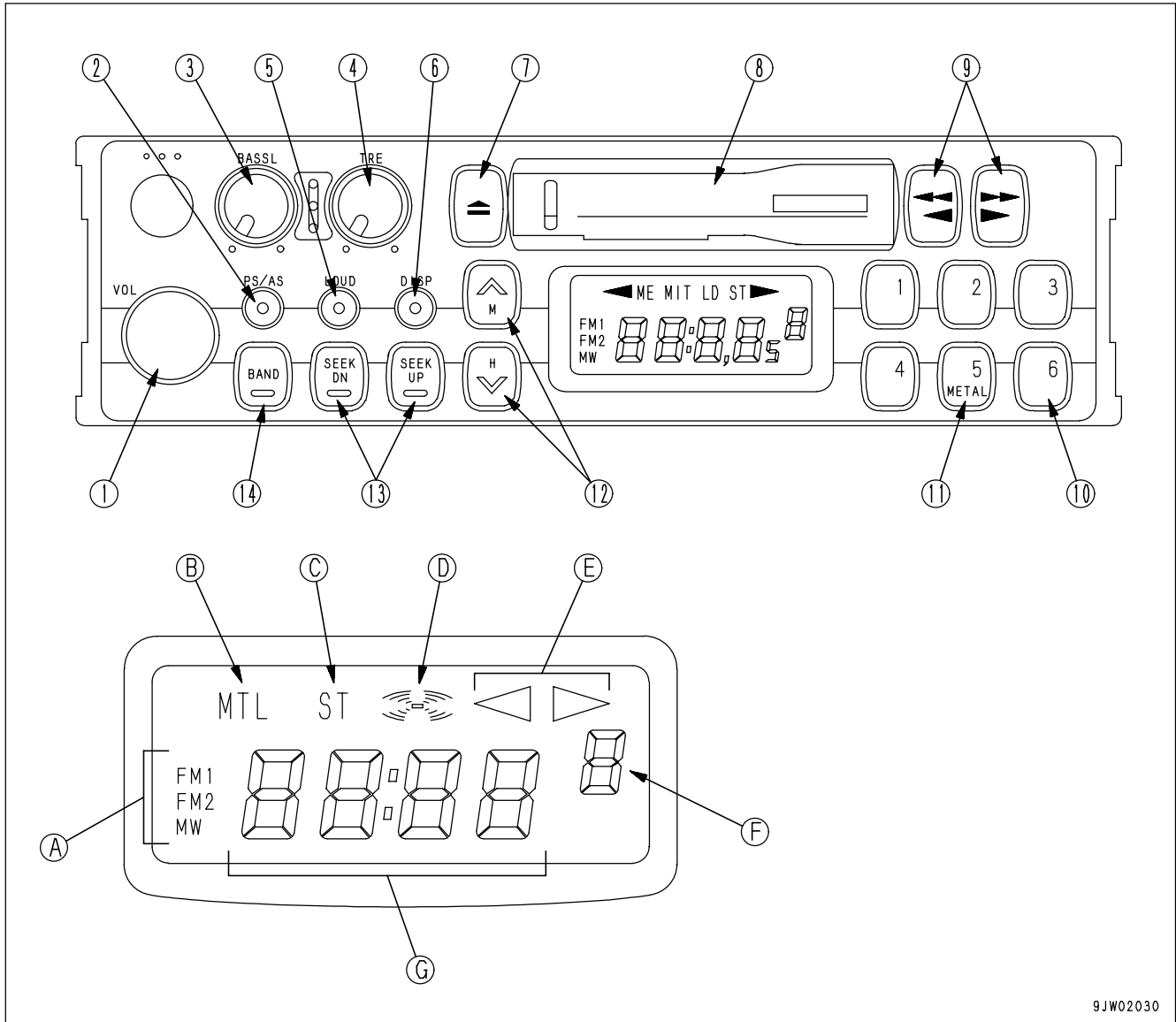
PRECAUTIONS FOR USE

- Stow the antenna when traveling in places with low overhead clearance.
- To ensure safety, always keep the sound to a level where it is possible to hear outside sounds during operation.
- If water gets into the speaker case or radio, it may lead to an unexpected failure, so be careful not to get water on the equipment.
- Do not wipe the scales or buttons with benzene, thinner, or any other solvent. Wipe with a soft dry cloth. Use a cloth soaked in alcohol if the equipment is extremely dirty.

CAR STEREO

(If equipped)

EXPLANATION OF COMPONENTS

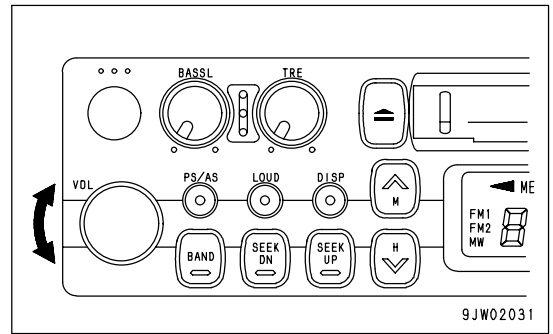


9JW02030

- (1) Power switch/Volume
- (2) Auto-store/Preset scan button
- (3) Bass control knob
- (4) Treble control knob
- (5) Loudness button
- (6) Time/Radio display selector button
- (7) Tape eject button
- (8) Cassette door
- (9) Fast forward, rewind buttons
- (10) Preset buttons
- (11) Metal tape button
- (12) Manual tuning buttons
- (13) Seek tuning buttons
- (14) Band selector button
- (A) Band display
- (B) Metal tape display
- (C) FM stereo reception display
- (D) Loudness display
- (E) Tape direction display
- (F) Preset channel display
- (G) Time/Frequency display

POWER SWITCH/VOLUME

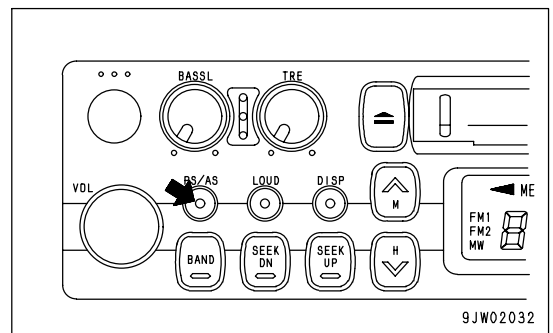
Turn this knob (1) to the right until it clicks to turn the power on.
Turn it further to increase the volume.



AUTO-STORE/PRESET SCAN BUTTON

Use this button (2) to actuate the preset scan and auto-store functions.

- Auto-store
Each time this button is pressed for more than 2 seconds while in radio reception, this auto-store function automatically starts to search for the desired station within a receivable band, and memorize the frequency in the preset memory. During this scanning process, the frequency shown in the right side of display continues to change. This indicates that each frequency is memorized in the auto-store.



REMARK

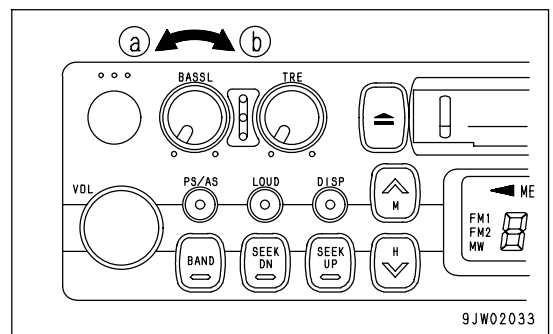
The auto-store function cannot be used when the channel display is flashing.
When the display is flashing, the preset scan function is being used.

- Preset scan
If this button is pressed for less than 0.5 second while in radio reception, programs from the six preset stations in the same band will be broadcast one after another for 5 seconds each, starting from No. 1 through No. 6 stations consecutively.
When the desired station is found, press the button again. This stops the preset scan tuning process and switches to ordinary broadcasting. The same process will be repeated continuously until the button is pressed again.

BASS CONTROL KNOB

Turn this knob (3) to the left to reduce the low tones; turn it to the right to emphasize the low tones.

- Direction (a): Low tone reduced
- Direction (b): Low tone emphasized

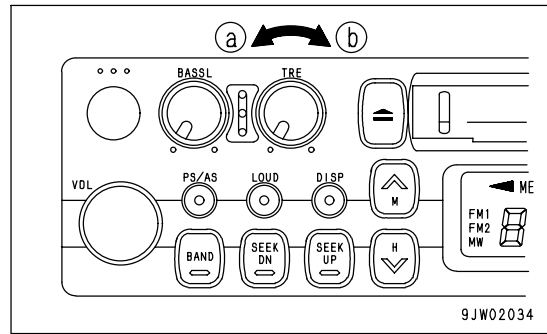


TREBLE CONTROL KNOB

Turn this button (4) to the left to reduce the low tones; turn it to the right to emphasize the high tones.

Direction (a): High tone reduced

Direction (b): High tone emphasized

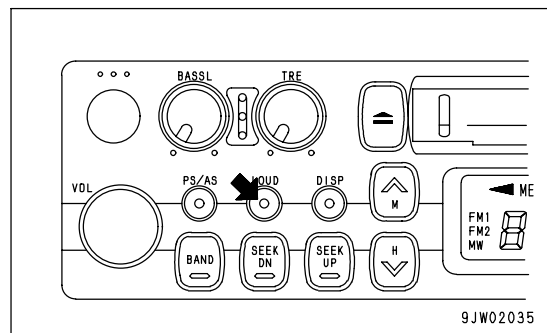


LOUDNESS BUTTON

This button (5) is used when playing at low volume. It makes it possible to hear more easily by emphasizing the low tone when the low tones are weak.

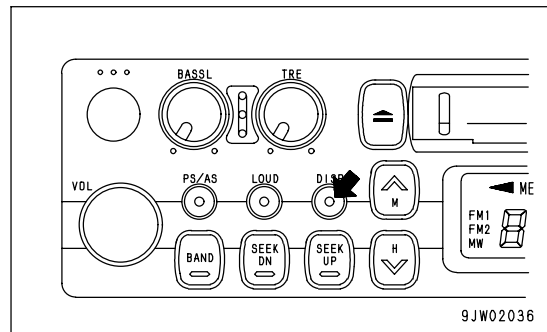
Push button: Actuated (ON)

Push button again: Canceled (OFF)



TIME/RADIO DISPLAY SELECTOR BUTTON

This button (6) is used to switch between the "Radio/tape display" and the "Time display".



• Correcting the time

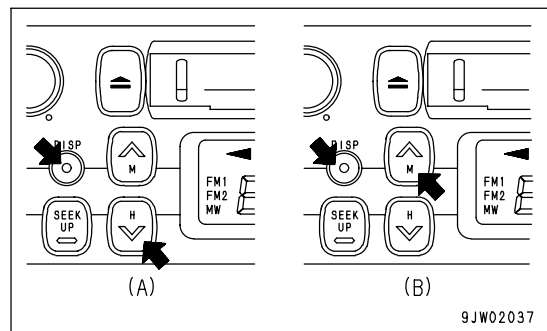
Press the button to set the time display.

(A) Correcting hour:

Keep the DISP button pressed and press the bottom (H) of the TUNING button to correct the hour.

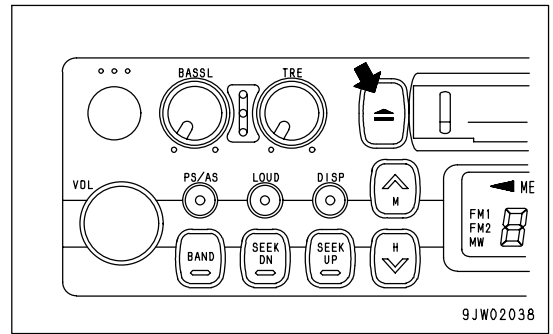
(B) Correcting minute:

Keep the DISP button pressed and press the top (M) of the TUNING button to correct the minute.



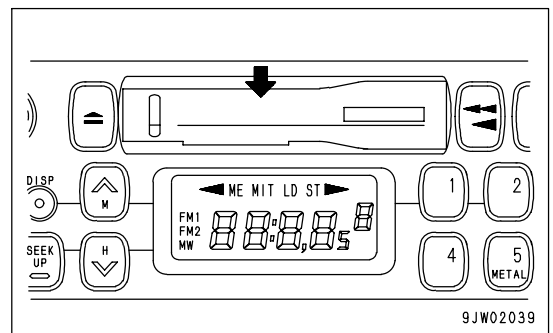
TAPE EJECT BUTTON

This button (7) is used to stop the tape and to eject the cassette. When this button is pressed, the tape is ejected and the radio plays.



CASSETTE DOOR

Set the cassette with the exposed portion of the tape on the right side and insert it through the cassette door (8).



FAST FORWARD, REWIND BUTTONS

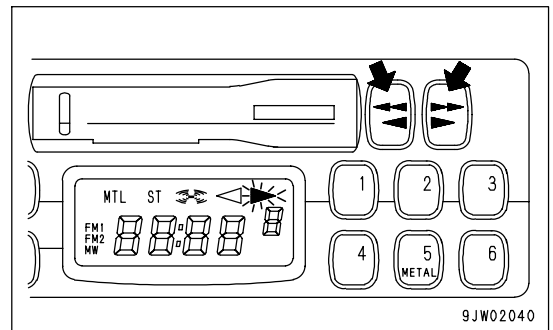
These buttons (9) are used to fast-forward or rewind the tape.

- Fast-forward/rewind

If you press the button pointing in the same direction as the lighted arrow indicating the direction of play, the tape will be fast-forwarded; if you press the button pointing in the opposite direction, the tape will rewind.

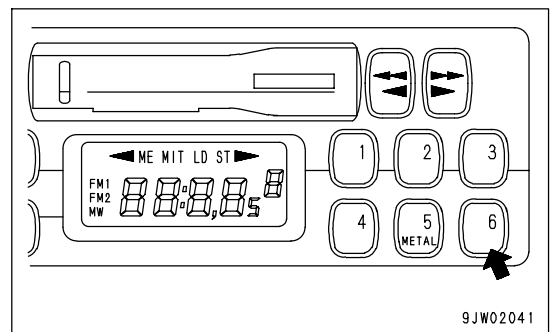
To stop the tape, lightly press the button that is not locked. The fast-forward or rewind operation will be canceled.

If the fast forward and rewind buttons are pressed at the same time, the tape will change sides.



PRESET BUTTONS

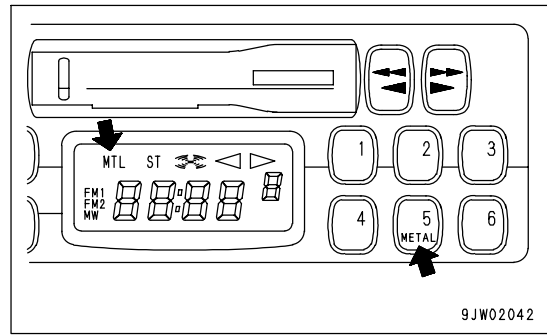
These buttons (10) are used to call up the broadcast station frequencies preset in memory for each of buttons No. 1 to No. 6. It is possible to preset 18 stations (FM: 12; AM: 6) with these buttons.



METAL TAPE BUTTON

(used also for preset button No. 5)

This button (11) is used when playing a metal or chrome tape. This button is also used for preset button No. 5. When it is pressed, "MTL" appears on the display.

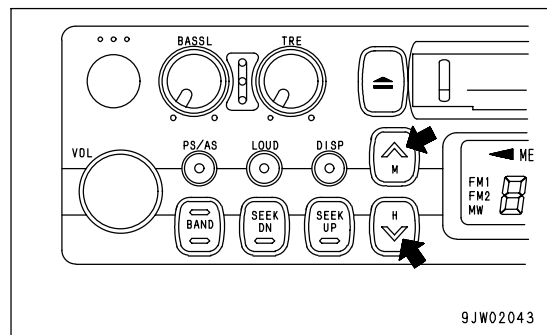


MANUAL TUNING BUTTONS

These buttons (12) are used for manual tuning.

When "TUN ^" button is pressed, the frequency goes up 9 kHz for AM or 0.1 MHz for FM; when "TUN v" button is pressed, the frequency goes down 9 kHz for AM or 0.1 MHz for FM.

If the button is pressed down and held, the frequency will change continuously.

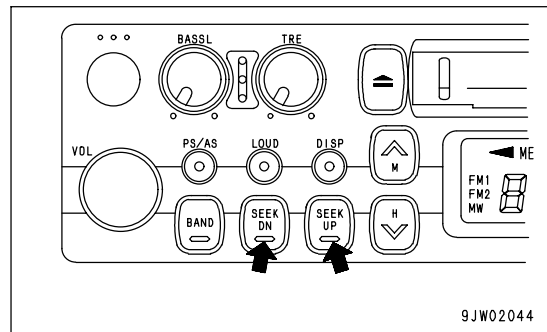


SEEK TUNING BUTTONS

These buttons (13) are used to seek tuning.

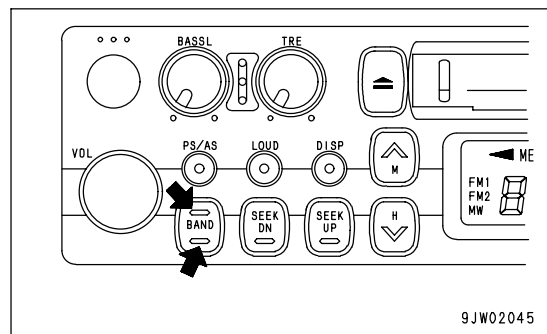
When the "SEEK UP" button is pressed, the search automatically goes up; when the "SEEK DOWN" button is pressed, the search automatically goes down.

When the next station that can be received is found, it automatically stops.



BAND SELECTOR BUTTON

When this button (14) is pressed, the band is switched between FM1, FM2, and MW (AM). The band is shown on the display.



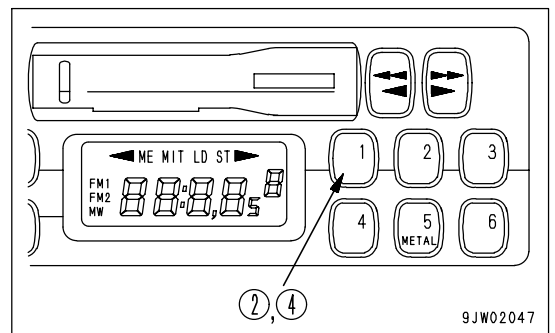
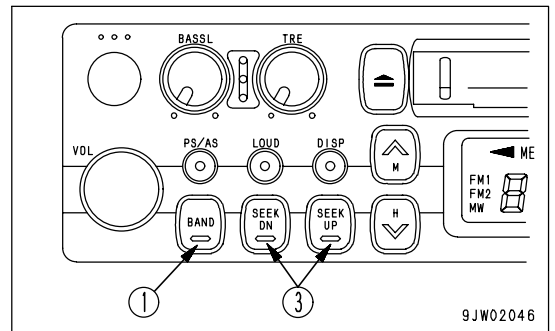
METHOD OF OPERATION

METHOD OF SETTING PRESET BUTTONS

To listen to a preset station, use band selector button (1) to select AM, FM1, or FM2, then press the preset switch number to listen to the desired station.

It is possible to preset six AM stations and 12 FM stations (FM1: 6, FM2: 6).

1. If you are playing a cassette, press the tape eject button to stop the tape.
2. Select the station to be preset.
Use band selector button (1) to select MW (AM), FM1, or FM2, then use the manual tuning button to select the frequency of the broadcasting station.
3. Press manual memory button (2) or seek tuning button (3).
4. Press preset button (4) of the number to be preset for 2 seconds while the frequency display is being shown on the display. (The preset channel and frequency are displayed and the presetting is completed).
5. Repeat Steps 2 to 4 to preset other stations.

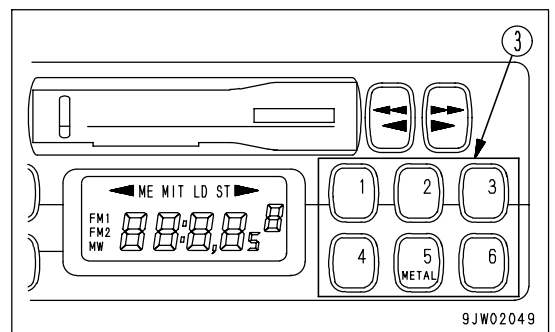
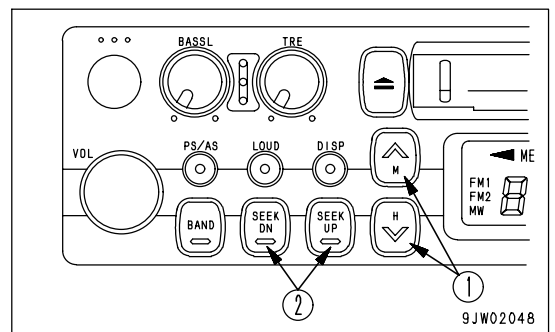


REMARK

- Use Steps 2 to 4 also when changing the setting of a preset switch to another station.
- When the power is disconnected, such as when the battery is replaced, all the settings are deleted, so preset the stations again.

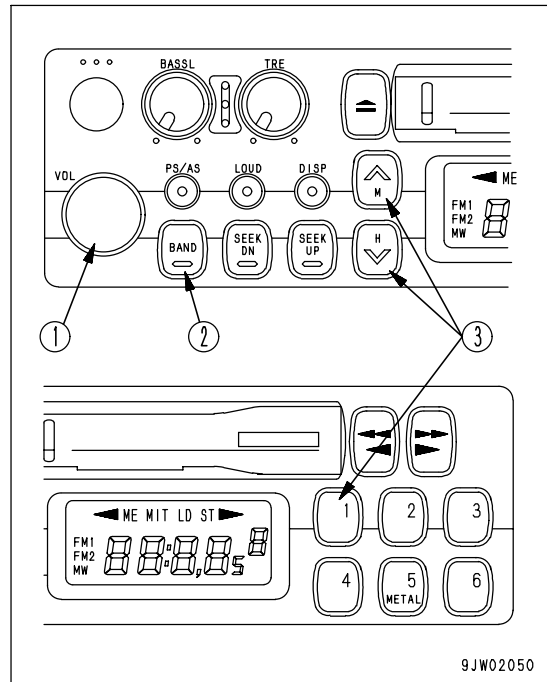
MANUAL MEMORY BUTTON

Select the station to be preset with manual tuning button (1) or seek tuning button (2), then keep button No.1 to button No.6 of button (3) pressed for 2 seconds while the frequency is being displayed to preset the station.



LISTENING TO RADIO

1. Turn the starting switch ON, then turn power switch (1) ON.
2. Set band selector button (2) to AM or FM.
3. Select the station with the preset buttons or manual tuning button (3).
4. Adjust the volume, balance, and tone as desired.
5. When turning the radio OFF, turn power switch (1) to the left until it clicks.



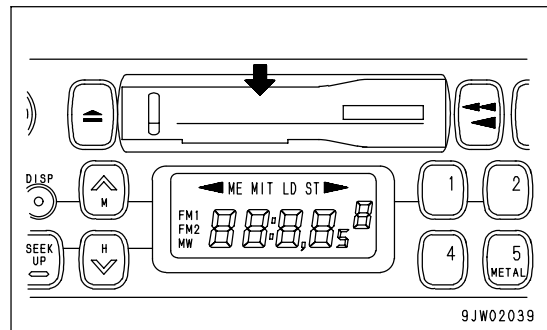
9JW02050

REMARK

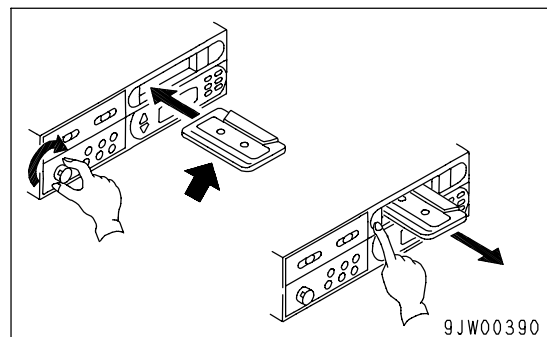
- To switch to the radio when listening to a cassette, press the cassette eject button to stop the tape.
- If you insert a cassette when listening to the radio, the tape will start to play.

LISTENING TO CASSETTE TAPE

1. Turn the starting switch ON, then turn power switch (1) ON.
2. Set the cassette with the exposed portion of the tape on the right side and push it past the cassette door. The tape will automatically start playing.
If the arrow indicating the direction of play is pointing to the right, the top side is being played; if the arrow is pointing to the left, the bottom side is being played.
When the tape reaches the end, it is automatically reversed and the other side starts to play.
3. When finished with the tape, press the cassette eject button to eject the tape and automatically switch to the radio.



9JW02039

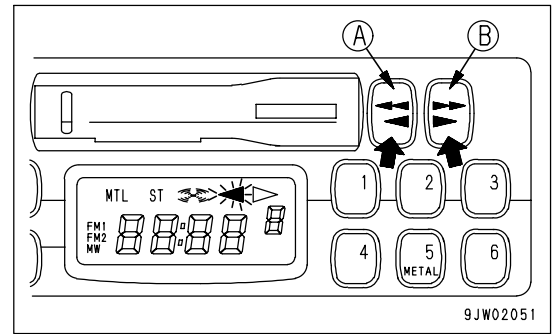


9JW00390

REVERSING TAPE

When listening to the tape, press both FAST FORWARD, REWIND buttons (A) and (B) at the same time lightly.

When this is done, the tape direction display will be reversed.

**PRECAUTIONS FOR USE**

- Stow the antenna when traveling in places with low overhead clearance.
- To ensure safety during operations, keep the volume at a level where it is possible to hear other machines.
- If water gets inside the speaker case or radio (auto tuning), it may cause a serious problem, take care not to let water get in these items.
- Do not wipe the scales or buttons with benzene, thinner, or any other solvent. Wipe with a soft dry cloth. Use a cloth soaked in alcohol if the equipment is extremely dirty.

NOTICE**Handling cassette tape**

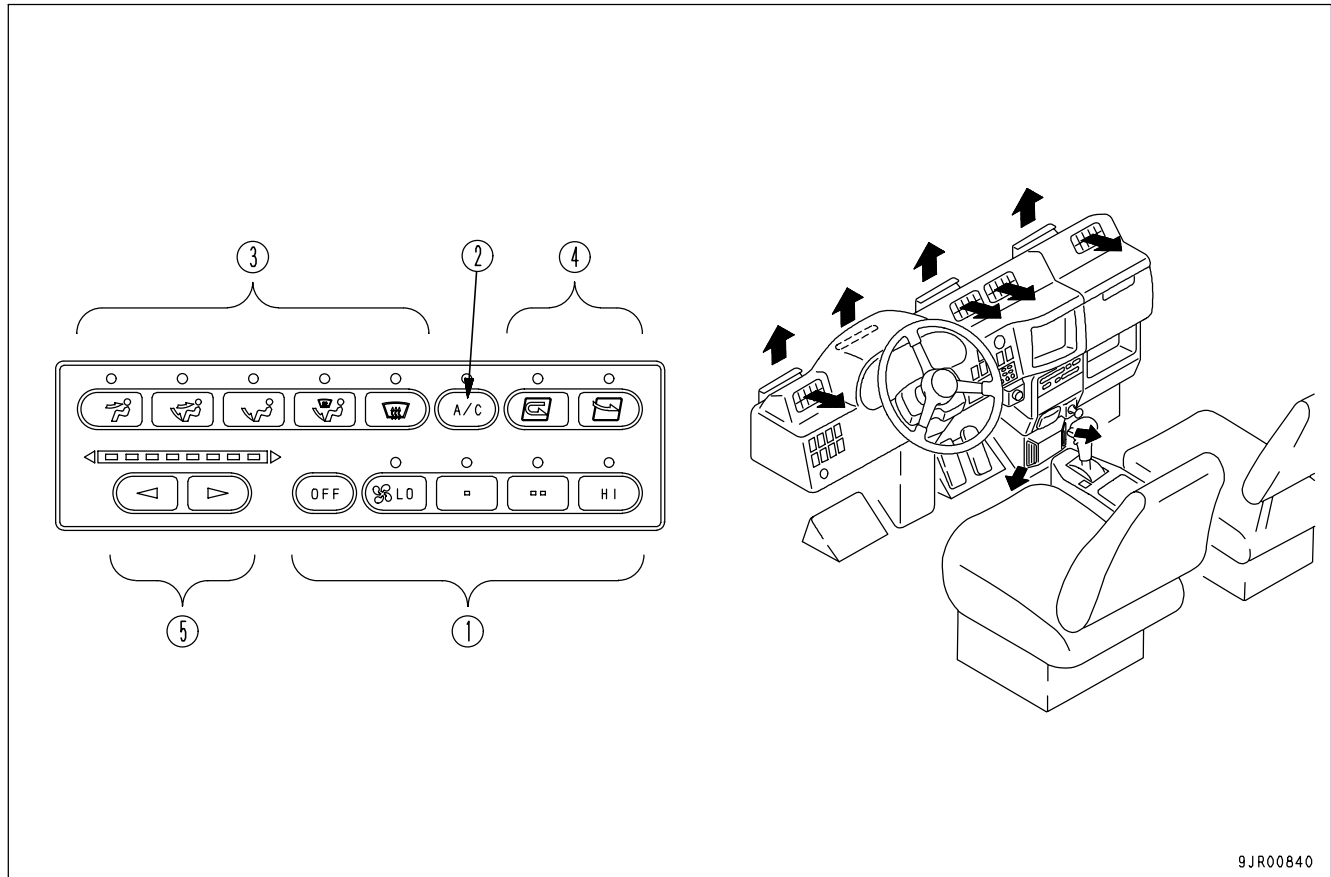
- Clean the tape head approx. once a month with a commercially available head cleaning tape.
- Do not leave the tape any place where it is exposed to direct sunlight, any place that is excessively dusty, or any place where there is a magnetic field.
- Do not use 120-minute tapes. The tape is thin and it easily gets caught up inside the machine.
- If the tape is slack, it easily gets caught up inside the machine. Use a pencil to wind in the tape to remove any slack.
- Do not use any cassette tape if the label has started to come off. It may cause defective rotation, or it may be impossible to get the tape out of the machine.

AIR CONDITIONER

(If equipped)

By taking fresh air into the cab through a filter, it is possible to raise the pressure inside the cab. This makes it possible to provide a pleasant working environment even on dusty jobsites.

GENERAL LOCATIONS ON CONTROL PANEL

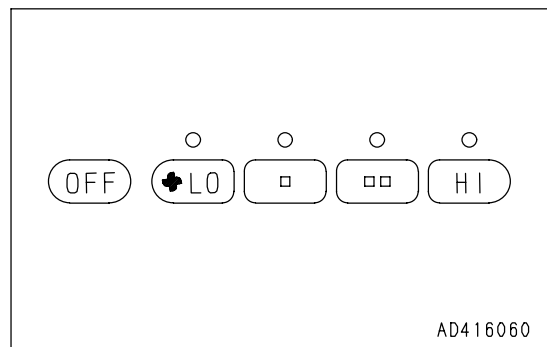


9JR00840

- (1) Fan switch
- (2) Air conditioner switch
- (3) Mode selector switch
- (4) RECIRC/FRESH selector switch
- (5) Temperature control switch

FAN SWITCH

This switch (1) can be used to adjust the air flow to 4 stages. This switch also acts as the main switch for the air conditioner. When the switch is pressed, the indicator lamp above the switch lights up to indicate the air flow.



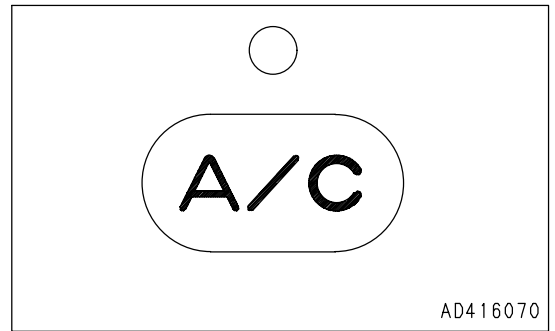
AD416060

AIR CONDITIONER SWITCH

This switch (2) is used to start or stop the cooling or dehumidifying function.

When the fan switch is turned ON and the air conditioner switch is pressed, the indicator lamp above the switch lights up.

When the switch is pressed again, the switch is turned OFF and the indicator lamp goes out.

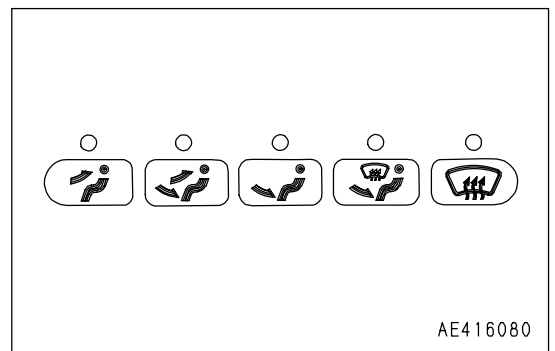


MODE SELECTOR SWITCH

This switch (3) is used to select the vents.

The following five vent modes are available: FACE, FACE/FOOT, FOOT, FOOT/DEF, DEF.

When the switch is pressed, the indicator lamp above the switch lights up to display the vent mode.



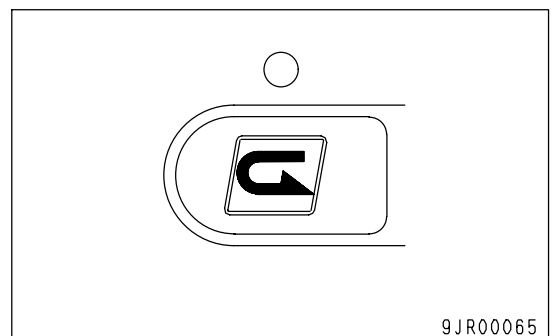
RECIRC/FRESH SELECTOR SWITCH

This switch (4) changes between recirculation of the internal air (RECIRC) or intake of external air (FRESH).

When pressing the switch, the indicator lamp on the top of switch lights up.

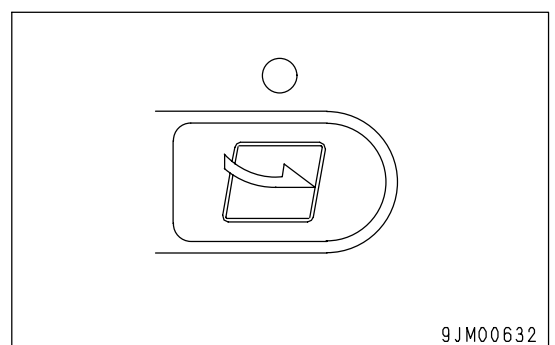
RECIRC

This switch (4) is used when wishing to quickly cool or warm the cab or when the air inside the cab is stale.



FRESH

This switch (4) is used to cool or warm the cab with the fresh. Also, it is used for fresh air intake or to remove condensation on windows.



TEMPERATURE CONTROL SWITCH

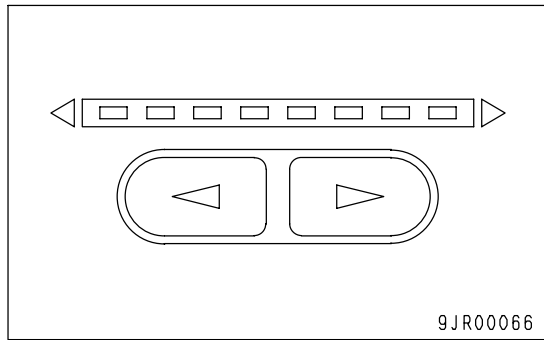
The temperature can be adjusted with this switch (5) steplessly from low temperature to high temperature.

The temperature level indicator lamps light up to display the temperature of the air coming from the vents.

The more the green lamps light up, the lower the temperature is.

The color of the indicator lamp changes while the switch is being pressed.

When the temperature reaches the desired level, release the switch to set the temperature.



The settings for each mode are retained in memory even when the starting switch is turned OFF.

However, in the following cases, the settings must be made again.

- When the machine has been out of use for more than 7 days
- When the battery voltage is extremely low
- When there has been abnormal interference from outside
- When the fan switch is turned OFF (the setting is not kept in memory with only the air conditioner switch)

If the air conditioner is used at the FRESH position, the inside of the cab will be pressurized and this will prevent the entry of dust. The higher the position of the fan switch, the more effective the pressurizing becomes.

METHOD OF OPERATION

Switch		Fan switch	Air conditioner switch	Temperature control switch	RECIRC/FRESH selector switch	Mode selector switch
Condition of use						
Cooling	Rapid	HI	ON	All green	RECIRC	FACE
	Normal	HI - LO	ON	More than half are green	FRESH	FACE
Dehumidifying, heating		HI - LO	ON	More than half are red	FRESH	FOOT
Heating	Rapid	HI	OFF	All red	RECIRC	FOOT
	Normal	HI - LO	OFF	More than half are red	FRESH	FOOT
Defroster		HI	ON	More than half are red	FRESH	DEF
Ventilation or pressurizing		HI - LO	OFF	All green	FRESH	FACE

When carrying out the defrosting, if the temperature control switch is set so that all lamps are red, this will improve the performance for defrosting and demisting.

With the FACE vents, it is possible to adjust the direction of the air flow and to turn it on or off.

However, do not set to the FACE mode with the vents closed.

- **WHEN NOT USING THE AIR CONDITIONER REGULARLY**

To lubricate each part of the compressor, operate cooling, dehumidifying and heating for 3 to 5 minutes once a month at low idle. Also, check the amount of cooling gas twice a year.

REMARK

If the temperature inside the cab is low, the air conditioner may not work. In such cases, use the recirculated air to warm up the inside of the cab, then turn the air conditioner switch on. The air conditioner will be run.

PRECAUTIONS WHEN USING AIR CONDITIONER**Carry out ventilation from time to time when using the cooling.**

- If you smoke when using the air conditioner in the RECIRC mode, your eyes may start to itch or burn. Ventilate the cab ever so often to remove the smoke.
- When using the air conditioner for a long period of time, carry out ventilation process at least once every hour.

Be careful not to cool the cab too much.

When using the air conditioner, it is recommended for health reasons, that it should only feel slightly cooler (5 or 6 °C (9 or 10.8°F) lower than the outside temperature) when you enter the cab.

Therefore, adjust the temperature to a suitable level.

INSPECTION AND MAINTENANCE

Even when not using the air conditioner, run the compressor at low speed for several minutes once a week to prevent the loss of the oil film at various parts of the compressor. (Run the engine at low speed and set the temperature control lever to the central position.)

Clean the air filter and check the refrigerant. For details, see "CLEAN AIR CONDITIONER AIR FILTER (PAGE 4-28)" and "CHECK REFRIGERANT (GAS) LEVEL (PAGE 4-29)".

To enable the air conditioner to perform to the full and to maintain a pleasant working environment, always contact your Komatsu distributor to have the air conditioner refilled with refrigerant and to carry out other checks.

OPERATION

CHECK BEFORE STARTING ENGINE

WALK-AROUND CHECK

Before starting the engine, look around the machine and under the machine to check for loose nuts or bolts, or leakage of oil, fuel, or coolant, and check the condition of the hydraulic system.

Check also for loose wiring, play, and accumulation of dust in places that get very hot and are exposed to extremely high temperatures.



WARNING

- Always hang the warning tag from the shift lever.
- Leakage of oil or fuel, or accumulation of flammable material around the battery or high temperature parts of the engine, such as the engine muffler or turbocharger, may cause fire. Check carefully, and if any problem is found, repair it or contact your Komatsu distributor.

Always carry out the following items before starting the engine each day.

1. Check the dump body, frame, tires, cylinders, linkage, and hoses for cracks or excessive wear or play.
Check the dump body, frame, tires, cylinders, linkage, and hoses for cracks or excessive wear or play, and carry out repairs if any problem is found.
2. Remove dirt from around engine, battery, radiator, and aftercooler.
Check that there is no dirt or dust accumulated around the engine, radiator or aftercooler. Check also that there is no flammable material (dry leaves, twigs, etc.) accumulated around the battery, or engine, muffler, turbocharger, or other high temperature parts of the engine. Remove any dirt or flammable materials that are found.
3. Check for leakage of water or oil around engine
Check that there is no oil leakage from the engine or coolant leakage from the cooling system. If any problem is found, repair it.
4. Check for oil leakage from transmission case, differential case, final drive case, steering/hoist oil tank, hoses, and joints
Check that there is no oil leakage. If any problem is found, repair the place where the oil is leaking.
Check for leakage of oil from the undercover. Check the ground for traces of oil leakage.
5. Check for loose air cleaner mounting bolts.
Check for the loose bolts. If loose, tighten them.
6. Check dump body mount rubber
Check for any cracks, embedded foreign objects, or loose bolts.
7. Check for damage to handrail, loose bolts
Repair any damage and tighten any loose bolts.

8. Check for damage to gauges, lamps on the instrument panel and loose bolts.
Check for damage to the panel, gauges and lamps. If any problem is found, replace the parts. Clean off any dirt on the surface. Tighten any loose bolts.
9. Check rear view mirror, under view mirror
Check for any damage to the mirrors, and if any damage is found, replace the mirror. Clean all dirt from the surface of the mirror and adjust the angle so that the view to the rear and below the machine can be seen from the operator's seat.
10. Check for damage to the seat belt and mounting clamps.
Check that there is no problem in the seat belt or mounting clamps. If there is any damage, replace with new parts.
 - Check for any loose bolts of the clamps mounting the equipment to the machine. Tighten any loose bolts.
 - When the belt has been used for a long time, if any external damage or fraying of the belt can be seen, or if the clamps are broken or deformed, replace the seat belt.
11. Inspect tires.

**WARNING**

If worn or damaged tires are used, they may burst and cause serious injury or death.

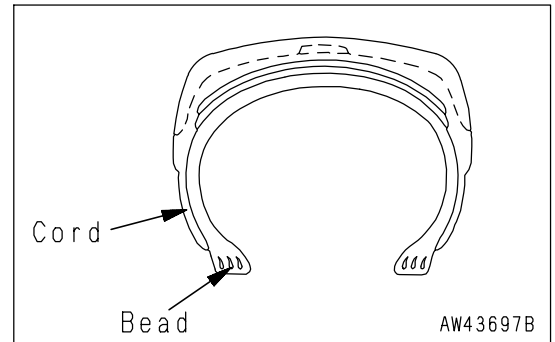
To ensure safety, do not use the following tires.

Wear:

- Tires with a tread grooves of less than 15% of that of a new tire
- Tires with extreme uneven wear or with stepped-type wear

Damage:

- Tires with damage that has reached the cords, or with cracks in the rubber
- Tires with cut or pulled cords
- Tires with peeled (separated) surface
- Tires with damaged bead
- Leaking or improperly repaired tubeless tires
- Deteriorated, deformed or abnormally damaged tires, which do not seem usable



12. Inspect rims.

**WARNING**

Check the rims (wheels) and rings for deformation, corrosion and cracks.

In particular, check the side rings, lock rings and rim flanges thoroughly.

CHECK BEFORE STARTING

Always perform the procedures in this section before starting the engine each day.

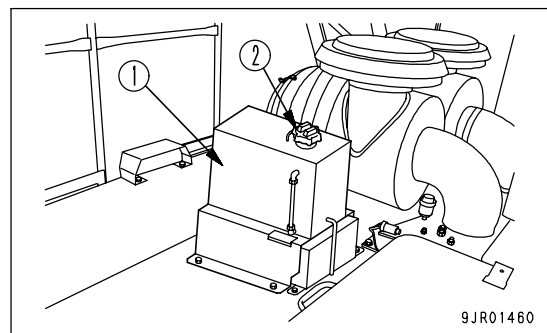
CHECK COOLANT LEVEL, ADD COOLANT



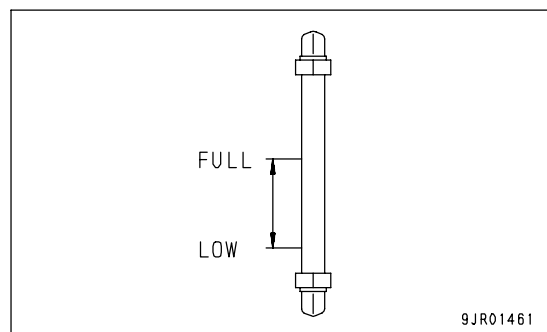
WARNING

- Do not open the radiator cap unless necessary. When checking the coolant, always wait for the engine to cool down and check the sub tank.
- Immediately after the engine is stopped, the coolant is at a high temperature and the radiator is under high internal pressure. If the cap is removed to check the coolant level in this condition, there is a hazard of burns. Wait for the temperature to go down, then turn the cap slowly to release the pressure and remove it carefully.

1. Check that the cooling water in sub tank (1) is between the FULL and LOW marks.
2. If the level is LOW, remove cap (2) and add the engine coolant up to the FULL mark.

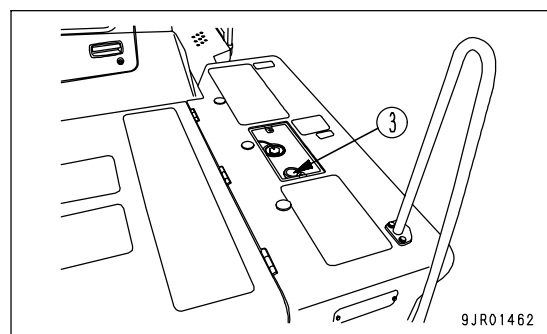


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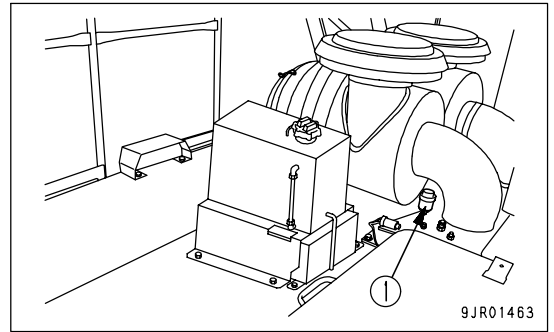
3. If there is no coolant in the subtank, add water to the radiator through water filler (3) at the top of the radiator, then add water to the subtank.
4. Check that there is no oil in the engine coolant or any other problem.
5. After adding coolant, tighten the cap securely.
6. If more coolant is added than normal, then check for water leakage.



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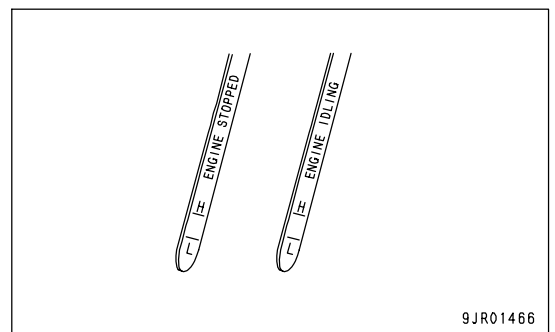
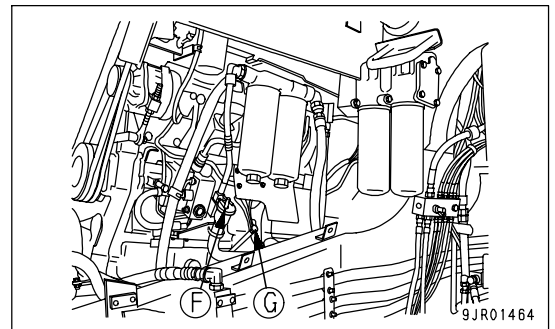
CHECK DUST INDICATOR

1. Check that the yellow display in the transparent portion of dust indicator (1) does not indicate 7.5 kPa (0.076 kgf/cm², 1.1 PSI).
2. If the red line indicates 7.5 kPa (0.076 kgf/cm², 1.1 PSI), clean or replace the air cleaner element immediately.
For details of the method of cleaning the element, see "CHECK, CLEAN OR REPLACE AIR CLEANER (PAGE 4-19)".
3. After checking, cleaning, or replacing, press the top of dust indicator (1) to return the yellow display to its original position.

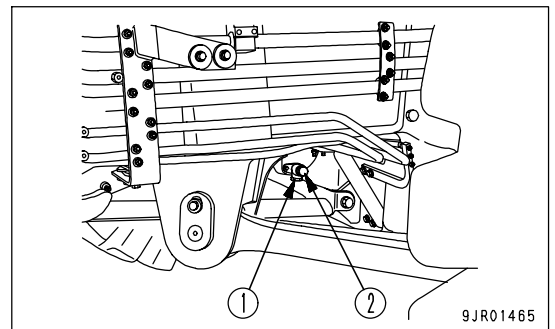
**CHECK OIL LEVEL IN ENGINE OIL PAN, ADD OIL****WARNING**

Parts and oil are at high temperature immediately after the engine is stopped and may cause serious burns. Wait for the oil temperature to go down before performing this operation.

1. Check the oil level with dipstick (G).
2. Take out the dipstick (G) and wipe off the oil with cloth.
3. Fully insert dipstick (G) into filler pipe (F), then remove it.
When inserting, insert so that the oil level gauge indicator is facing the engine.
4. The oil level should be between the H and L marks on the ENGINE STOPPED side of dipstick (G).
If the oil is below the L mark, add oil through oil filler (F).



5. If the oil is above the H mark, remove drain plug (1), and loosen drain valve (2) to drain the excess engine oil, then check the engine oil level again.
6. If the oil level is correct, tighten the handle of the oil filler cap securely.

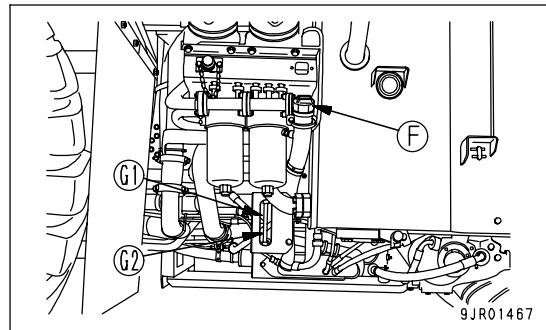


REMARK

- When checking the oil level after the engine has been operated, wait for at least 15 minutes after stopping the engine.
- If the machine is at an angle, make it horizontal before checking.
- The dipstick has the oil level marked on both sides: ENGINE STOPPED for measuring when the engine is stopped, and ENGINE IDLING for measuring when the engine is idle.
- When checking the oil level, stop the engine and check with the ENGINE STOPPED side of the dipstick. It is also possible to check when the engine is idle, but the following procedure must be used.
 - Check that the engine water temperature is in the white range.
 - Use the ENGINE IDLING side of the dipstick.
 - Remove the oil filler cap.

CHECK OIL LEVEL IN TRANSMISSION CASE, ADD OIL

1. After starting the engine, run the engine at low idle and check the oil level with sight gauge (G2).
2. If the oil level is low, add oil through oil filler (F).

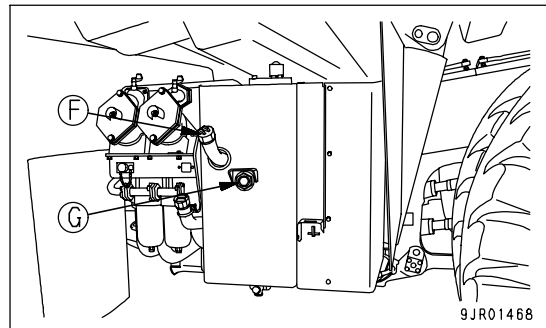
**NOTICE**

- The oil level changes according to the oil temperature, so carry out the check after completing the warming-up operation.
- During operations, or when the engine is running at idle after operations, the oil level should be above (G2).
- When checking the oil level with the engine stopped, check with sight gauge (G1) as a guide line, and make the final check with (G2).
- When checking the oil level with the engine stopped, wait for 20 minutes after stopping the engine and check with sight gauge (G1).

CHECK OIL LEVEL IN STEERING AND HOIST OIL TANK, ADD OIL**WARNING**

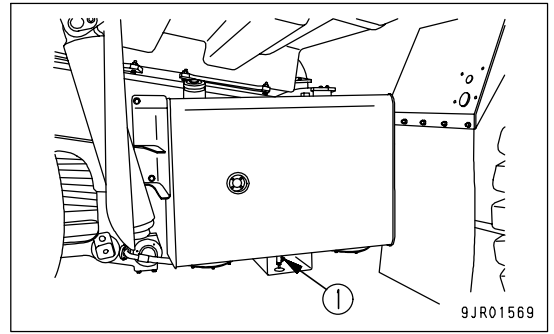
When removing the oil filler cap, oil may spurt out, so turn the cap slowly to release the internal pressure before removing the cap.

1. Check with sight gauge (G).
2. If the oil level is not up to the window of sight gauge (G), add oil through oil filler (F).



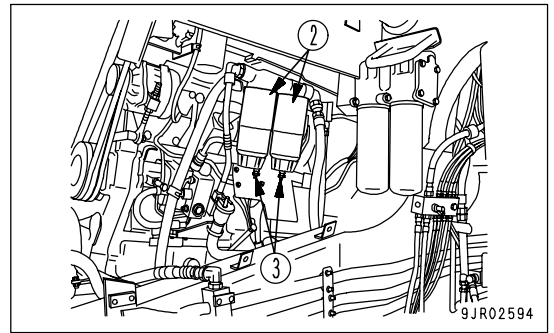
DRAIN WATER, SEDIMENT FROM FUEL SYSTEM

Loosen valve (1) at the bottom of the fuel tank, and drain the water and sediment collected at the bottom of the tank together with the fuel.



When a fuel filter with water separator is installed, drain the water and sediment from the fuel tank, then drain the water from the filter as follows.

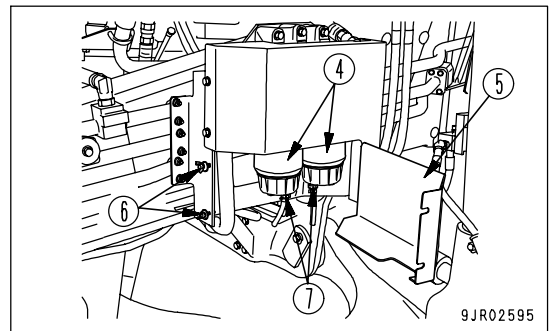
If there is water accumulated in the plastic cup at the bottom of filter (2), open drain valve (3) and drain the water. Drain the water from all filters.



When a filter with water separator is installed, drain the water and sediment from the fuel tank, then drain the water from filters (2) and (4) as follows.

Loosen screw (6) at the bottom of filter cover (5), then open the cover.

If there is water accumulated in the plastic cap at the bottom of filter (4), open drain valve (7) and drain the water.

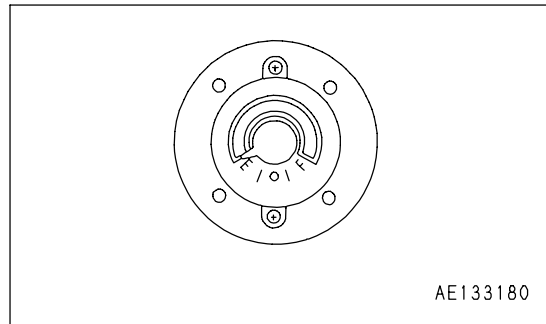
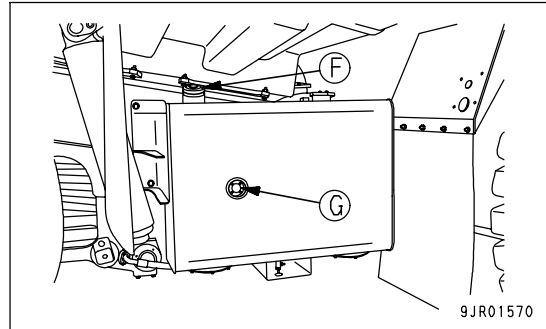


CHECK FUEL LEVEL, ADD FUEL

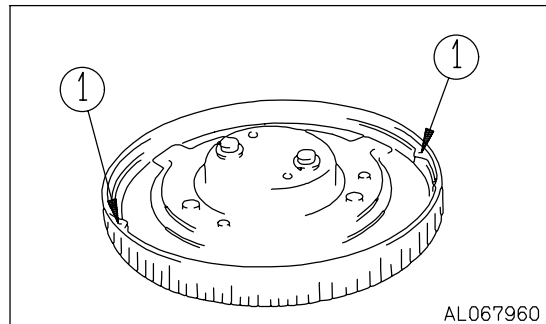
**WARNING**

When adding fuel, never let the fuel overflow. This may cause a fire. If any fuel is spilled, wipe it up completely. Never bring flames near fuel because it is highly flammable and dangerous.

1. Check the fuel level with fuel gauge (G), which is installed in the side of the fuel tank.
2. After completing operations, add fuel through fuel filler (F) to fill the tank.
Fuel tank capacity: 780 liters (206.1 US gal)
3. After adding fuel, tighten the cap securely.

**REMARK**

- If the breather hole in the cap (1) becomes clogged, the pressure inside the tank will go down and the fuel may not flow, therefore clean the breather hole from time to time.
- To prevent air from being sucked into the engine, do not let the level in the fuel tank go down too low.



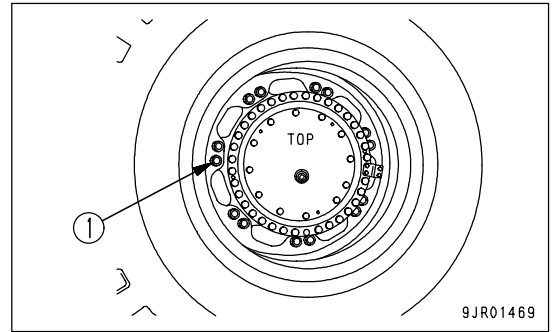
CHECK WHEEL HUB NUTS, TIGHTEN

Check for loose wheel hub nuts (1). If any are found, tighten them.
Tightening torque: 1520 to 1850 N·m
(155 to 189 kgf·m, 1121 to 1367 lbft)

Insert a socket wrench in a pipe, and apply a force of 1740 N (177 kgf) at a point 1 m from the fulcrum to give a tightening torque of 1740 N·m (177 kgf·m, 1280 lbft).

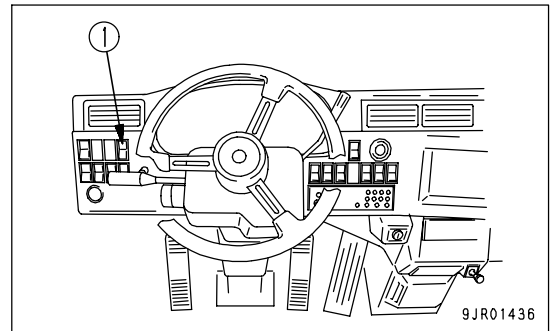
When tightening the hub nuts after replacing the tires, travel for 5 to 6 km, then check the tightening torque to ensure that there are no loose bolts.

If any stud bolt used to install the rim is broken, replace all the stud bolts for that wheel.

**CHECK CENTRAL WARNING LAMP, ALARM BUZZER, MONITOR LAMPS AND METERS**

Before starting the engine, turn the starting switch to the ON position, press machine monitor check switch (1), and check that there is no failure in any monitor lamp.

If any instrument does not work, there is probably a failure, so please contact your Komatsu distributor for inspection.

**CHECK BRAKING EFFECT**

Check that the parking brake, foot brake, and retarder brake work properly.
If there is any problem, please contact your Komatsu distributor for repair.

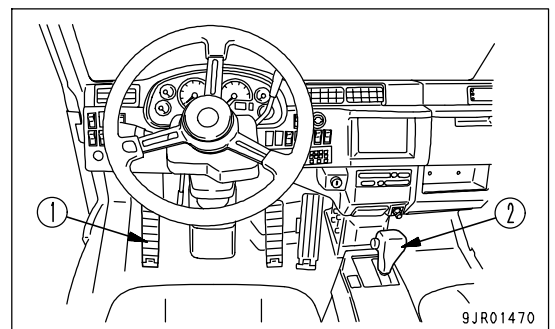
CHECK BRAKING CAPACITY OF EMERGENCY BRAKE

WARNING

If the machine moves, it will lead to serious injury. If machine begins to move during the inspection of braking capacity, lower the engine speed immediately, set shift lever at N position, and then set parking brake switch at PARKING position.

Check the braking capacity of the emergency brake as follows.

1. Stop the machine on flat ground, raise the oil pressure to the maximum, set the parking brake to TRAVEL, then depress emergency brake pedal (1).
2. Set gear shift lever (2) to the D position, gradually raise the engine speed, and check that the machine does not move even when the engine reaches full speed. If the machine does not move, it is normal.
3. Lower the engine speed and set the shift lever to "N" position and set the parking brake switch to the "PARK" position.

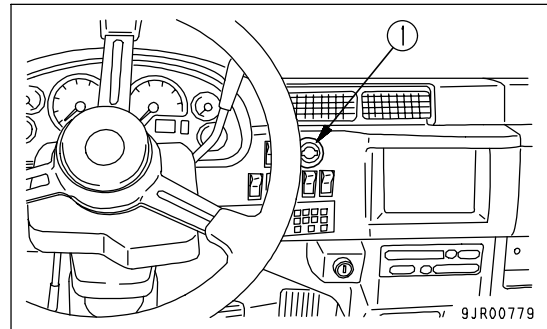


CHECK EMERGENCY STEERING

Check manual emergency steering

1. Turn starting switch key to the ON position.
2. Turn emergency steering switch (1) ON, and check that the steering wheel can be operated.

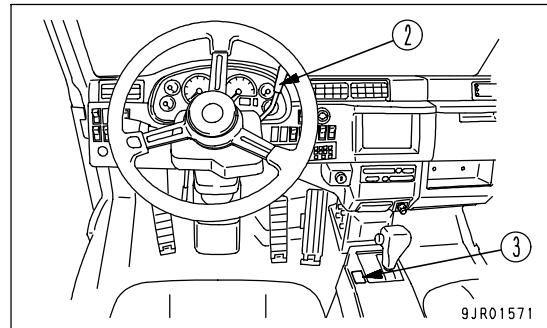
If the steering wheel cannot be operated, please contact your Komatsu distributor.



Check auto-emergency steering

(Machines equipped with auto emergency steering)

1. Turn the starting switch key to the START position and start the engine.
2. Check that the brake oil pressure caution lamp is OFF, then pull retarder control lever (2) fully and stop the engine.
3. Turn starting switch key to the ON position.
4. Check that the emergency steering monitor is actuated and the steering can be operated 1 sec. after parking brake switch (3) is set to the TRAVEL position.



CHECK BACKUP ALARM

1. Turn the engine starting switch to the ON position.
2. Place the gear shift lever in the R position and check that the backup alarm is working.

CHECK ELECTRIC WIRING

WARNING

- If the fuses frequently blow or if there are traces of short circuits in the electrical wiring, locate the cause and immediately perform repairs, or contact your Komatsu distributor for repairs.
- Keep the top surface of the battery clean and check the breather hole in the battery cap. If it is clogged with dirt or dust, wash the battery cap to clean the breather hole.

Check for damage and wrong capacity of the fuse and any sign of disconnection or short circuit in the electrical wiring. Check also for loose terminals and tighten any loose parts.

Check the wiring of the "battery", "starting motor" and "alternator" carefully, in particular.

Always check if there is any accumulation of flammable material around the battery, and remove such flammable material.

Please contact your Komatsu distributor for investigation and correction of any problems found.

CHECK INFLATION PRESSURE OF TIRES

Measure the inflation pressure with a tire pressure gauge, while the tires are cool, before starting work.

Check for damage or wear to the tires and the rims.

Check for loose wheel hub bolts.

The proper inflation pressure is shown below.

- HD465-7

Tire size	Inflation pressure
24.00-35-36PR (standard)	0.47 MPa (4.75 kgf/cm ² , 67.4 PSI)
24.00R35 ★ ★ (if equipped)	0.69 MPa (7.00 kgf/cm ² , 99.4 PSI)

- HD605-7

Tire size	Inflation pressure
24.00R35 ★ ★ (standard)	0.69 MPa (7.00 kgf/cm ² , 99.4 PSI)
24.00-35-48PR (if equipped)	0.64 MPa (6.50 kgf/cm ² , 92.3 PSI)

NOTICE

If the tires are used when the inflation pressure is less than the value given in the table above, the rim may be damaged.

Always keep the tire inflation pressure within +0 to +0.03 MPa (0.3 kgf/cm², 4.3 PSI) of the value in the table above.

ADJUSTMENT BEFORE OPERATION

ADJUSTING OPERATOR'S SEAT

WARNING

- Park the machine in a safe place and stop the engine when carrying out adjustment of the operator's seat.
- Adjust the seat before starting operations or when changing operators.
- Adjust the position of the operator's seat so that you can depress the brake pedal fully with your back against the seat backrest.

(A) Fore-and-aft adjustment

Pull lever (1) up, set the seat to the desired position, then release the lever.

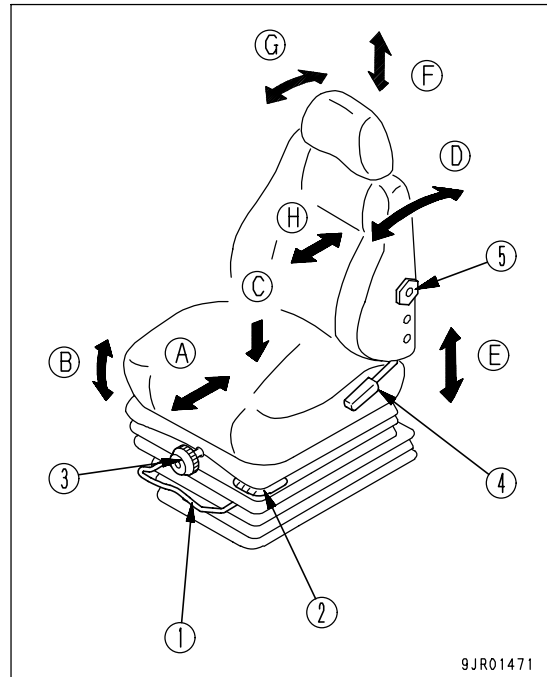
Amount of adjustment: 180 mm (7.1 in)
(10 mm (0.4 in) x 18 stages)

(B) Adjusting seat angle

Move lever (2) up and push down on the rear of the seat to tilt it backward.

Move lever (2) down and push down on the front of the seat to tilt it forward.

Adjustment range: 13 degrees (Tilt forward/tilt back angle)



(C) Setting seat for operator's weight

Turn grip (3) to adjust the strength of the suspension.

Adjustment range: (Target) 50 to 120 kg (110 to 265 lb)

(D) Adjusting backrest angle

Move lever (4) up and move the backrest to the front or rear.

When doing this, keep your back pressed against the seat back.

If your back is not against the seat back, the seat back may spring back suddenly.

Adjustment range: 66° to the front (3° x 22 stages)

72° to rear (3° x 24 stages)

(E) Seat height adjustment

Move lever (2) up/down, then move the seat up or down as desired. Since lever (2) is also used for adjusting seat angle, set the seat to the desired height while adjusting the angle.

Adjustment range: 60 mm (2.4 in)

(F) Adjusting headrest height

Move the headrest up and down to the desired height.

Adjustment range: 50 mm (2.0 in)

(G) Adjusting headrest angle
 Rotate the headrest to the front or rear.

(H) Lumbar support
 Turn grip (5) to adjust the tension applied to the lower back.

ADJUST SEAT BELT

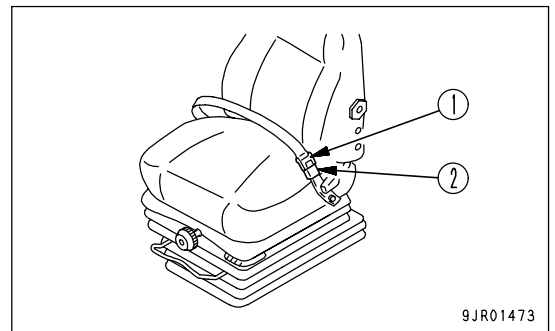
! WARNING

- Before fastening the seat belt, check that there is no problem in the securing brackets or belt. If there is any wear or damage, replace.
- Even if there appears to be no problem in the seat belt, replace the seat belt once every 3 years. The date of manufacture is woven on the reverse side of the belt.
- Adjust and fasten the seatbelt before starting to travel.
- Always use the seatbelt when traveling.
- Do not use the seat belt with either half of the belt twisted.

Fastening and removing belt

Fasten the belt so that it is tight without being too tight.

1. Sit on the seat, depress the brake pedal fully, and adjust the seat so that your back is pressed against the backrest.
 2. Sit in the seat, pull the right side of the belt, then insert tongue (1) into buckle (2) until a click is heard.
 3. When removing the belt, press the red button in buckle (2) to free the belt.
- Fit the belt so that it follows your body and is not twisted.



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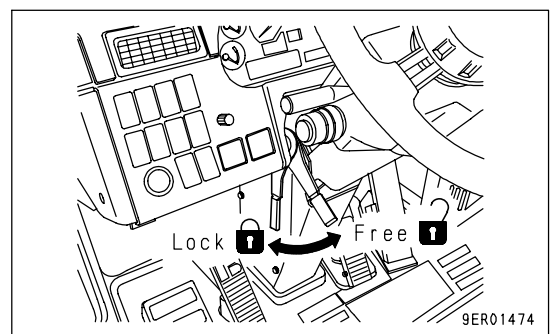
ADJUST STEERING WHEEL TILT

! WARNING

Always stop the machine before adjusting the tilt of the steering wheel.

The tilt of the steering wheel can be adjusted to the front and rear, and up and down. Pull lever up and set the steering wheel to the desired position, then push lever down to lock the steering wheel securely in position.

Amount of adjustment: Front/rear: 80 mm/80 mm (3.2 in/3.2 in)
 (from center of steering wheel)
 Up: 33 mm (1.3 in)
 Down: 17 mm (0.7 in)

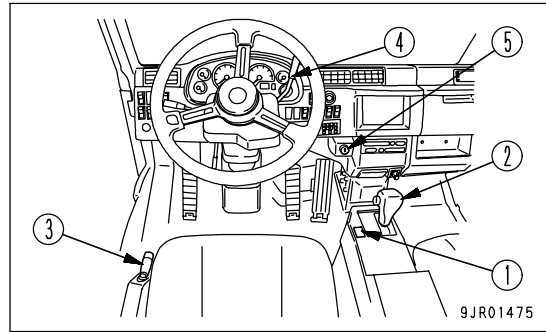


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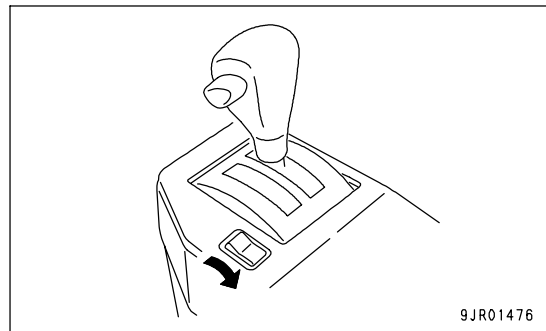
OPERATIONS, CHECKS BEFORE STARTING

! WARNING

- When starting the engine, check that the shift lever is set in the N (neutral) position and that the parking brake switch is at PARKING position.
- Before standing up from the operator's seat, place the shift lever at N (neutral) position, and set the parking brake switch to the PARKING position.



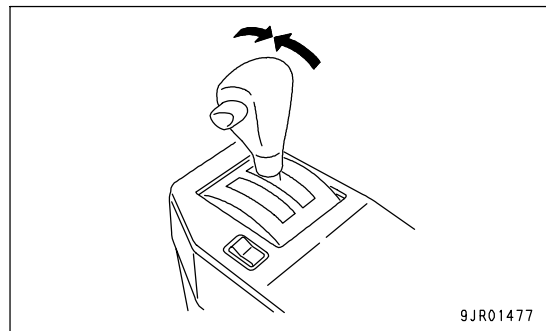
1. Check that parking brake switch (1) is in the PARKING position.



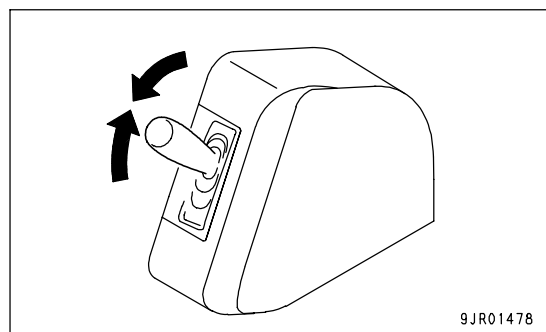
2. Check that gear shift lever (2) is at the N position.

REMARK

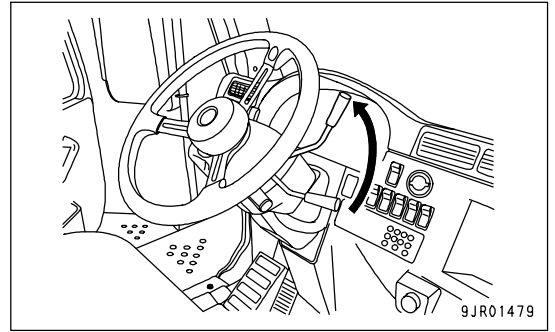
If the starting switch is turned to the ON position when the shift lever is not at the N position, the shift lever position pilot lamp and central warning lamp will flash, and the alarm buzzer will sound.



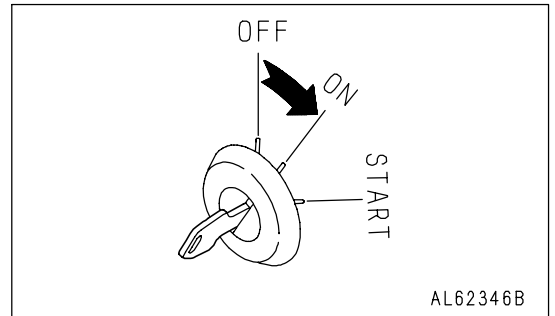
3. Check that dump lever (3) is at the HOLD position.



4. Check that retarder control lever (4) is at the RELEASED position.



5. Check that there is no problem in the machine monitor when starting switch (5) is turned to the ON position.

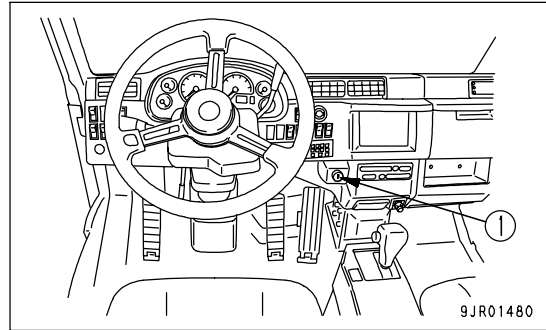


STARTING ENGINE

NORMAL STARTING

WARNING

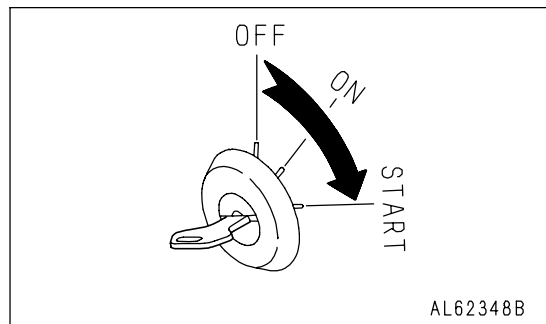
- Sit down in the operator's seat before starting the engine.
- Do not attempt to start the engine by short-circuiting the engine starting circuit. Such an act may cause serious bodily injury or fire.
- Check that there are no persons or obstacles in the surrounding area, then sound the horn and start the engine.
- Exhaust gas is toxic. When starting the engine in confined spaces, be particularly careful to ensure good ventilation.



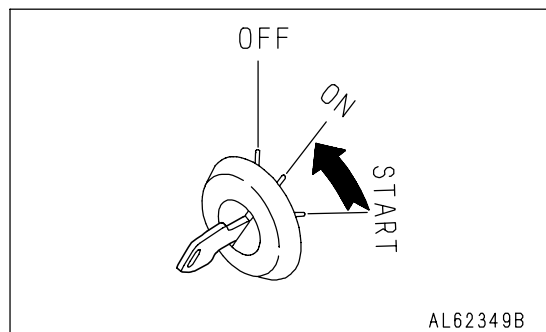
NOTICE

- Do not accelerate the engine suddenly before completing the warming-up operation.
- Do not keep the starting motor rotating continuously for more than 20 seconds.
- If the engine does not start, wait for at least 2 minutes before trying to start the engine again.

1. Turn the key of starting switch (1) to the START position to start the engine.



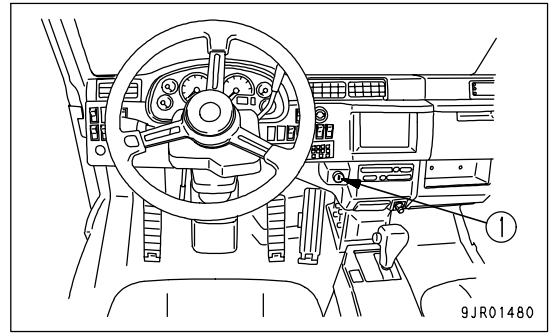
2. When the engine starts, release the key in starting switch (1). The key will return automatically to the ON position.



STARTING IN COLD WEATHER

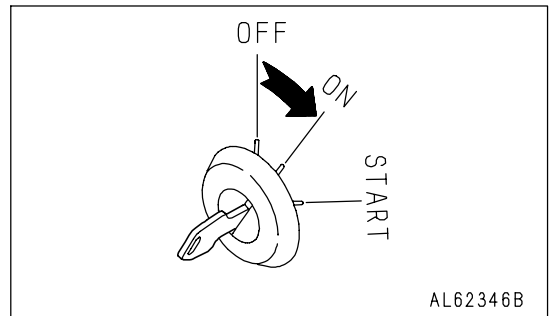
⚠ WARNING

- Start the engine only after sitting down in the operator's seat.
- Do not attempt to start the engine by short-circuiting the engine starting circuit. Such an act may cause a serious bodily injury or fire.
- Check that there are no persons or obstacles in the surrounding area, then sound the horn and start the engine.
- Never use starting aid fluids as they may cause explosions.
- Exhaust gas is toxic. When starting the engine in confined spaces, be particularly careful to ensure good ventilation.



NOTICE

- Do not accelerate the engine suddenly before completing the warming-up operation.
- Do not keep the starting motor rotating continuously for more than 20 seconds.
- If the engine does not start, wait for at least 2 minutes before trying to start the engine again.



1. Turn the key of starting switch (1) to the ON position.
2. The pre-heating will start automatically according to the engine water temperature and the pre-heating pilot lamp will light up.

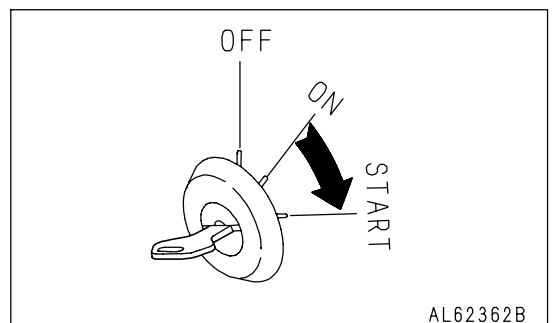
The pre-heating times are as shown below.

Engine water temperature	Pre-heating time
below 0°C (32°F)	30 sec

3. When the pre-heating is completed, the pre-heating pilot lamp will go out.
4. When the engine starts, release the key in starting switch (1).
The key will return automatically to the ON position.

REMARK

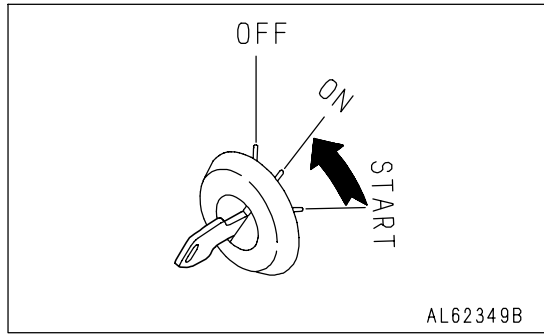
When starting the engine, the monitor may flash while the starting motor is turning, but if the monitor lamp goes out after the engine is started, there is no problem.



5. When the engine starts, release the key in starting switch (1).
The key will return automatically to the ON position.

REMARK

- If the engine does not start, turn the key in starting switch (1) to the OFF position, then turn it back to the ON position. The pre-heating will automatically start again according to the engine water temperature.
- Immediately after the engine is started, the turbo protect function is actuated to prevent the engine speed from rising above 1000 rpm even when the accelerator pedal is depressed.



Engine water temperature	Turbo protect time
above 0°C (32°F)	0 sec
-10°C to 0°C (14°F to 32°F)	0 to 5 sec
below -10°C (14°F)	5 sec

AUTOMATIC WARMING-UP OPERATION

After the engine starts, if the engine water temperature is low (below 50°C (122°F)), the warming-up operation (engine speed: 945 rpm) is automatically carried out. When the water temperature goes above 50°C (122°F), the warming-up operation is canceled.

OPERATIONS, CHECKS AFTER STARTING ENGINE

BREAKING-IN THE MACHINE



CAUTION

Your Komatsu machine has been thoroughly adjusted and tested before shipment. However, operating the machine under severe conditions at the beginning can adversely affect the performance and shorten the machine life.

Be sure to break-in the machine for the initial 100 hours (as indicated by the service meter).

During break-in operations, follow the precautions described in this manual.

- Idle the engine for 5 minutes after starting it up.
- Avoid operation with heavy loads or at high speeds.
- Immediately after starting the engine, avoid sudden starts, sudden acceleration, unnecessary sudden stops, and sudden changes in direction.

WARMING-UP OPERATION

NOTICE

Do not accelerate the engine suddenly until the warming-up operation has been completed.

Do not run the engine at low idle or high idle continuously for more than 20 minutes.

If it is necessary to continue to run the engine at idle, apply a load from time to time or run the engine at a mid-range speed.

After starting the engine, do not immediately start operations. First, perform the following operations and checks.

1. After starting the engine, run the engine at idle for 5 minutes for warming up operation.
2. After the warming-up operation, check that the machine monitor is normal.
If there is any problem, carry out maintenance or repair.
When the AISS LOW switch is at the AUTO position and the engine water temperature is still low, high idle revolution is automatically maintained.
3. Check if there is no problem in the steering operation, flashing of lights, sound of horn, exhaust gas color, noise, or vibration. If any problem is found, repair it.
When the steering oil temperature is low, the steering will become slightly heavier, so avoid operating the steering when traveling at high speed.

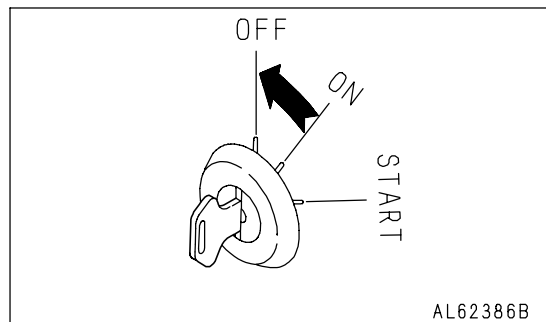
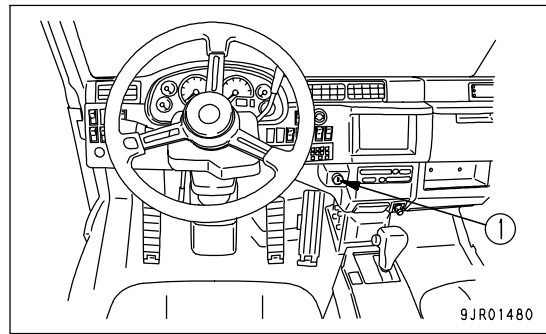
STOPPING ENGINE

NOTICE

If the engine is suddenly stopped without allowing it to cool down, there is danger that the life of the engine parts will be shortened, so never stop the engine suddenly except in emergency.

Allow the engine to cool down gradually before stopping it.

1. Set the shift lever to the N position, then set the parking brake switch to the PARKING position.
2. Lower the dump body and set the dump lever to the HOLD position.
3. Run the engine at low idle for about 5 minutes to cool down gradually.
4. Turn the key of starting switch (1) to the OFF position to stop the engine.
5. Remove the key from starting switch (1).



CHECKS AFTER STOPPING ENGINE

1. Walk around the machine and check the dump body, body work, and undercarriage, and check also for leakage of oil and water.
2. Fill the fuel tank.
3. Check the engine compartment for paper and debris. Clean out any paper and debris to avoid a fire hazard.
4. Remove any mud affixed to the undercarriage.

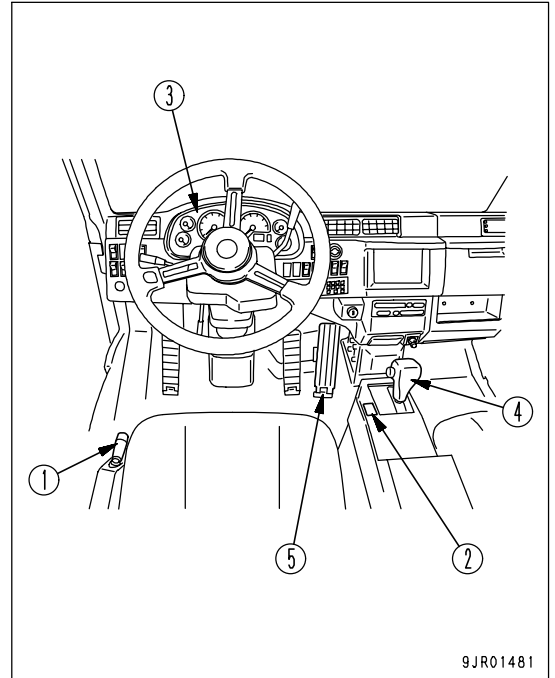
MOVING MACHINE OFF (FORWARD, REVERSE), STOPPING

MOVING MACHINE FORWARD

WARNING

- When moving the machine off, check that the area around the machine is safe, then sound the horn before starting.
- Do not allow people to get near the machine.
- Clear the machine's travel path of any obstacle.
- Pay a particular attention to the blind spot at the rear of the machine, when traveling the machine in reverse.

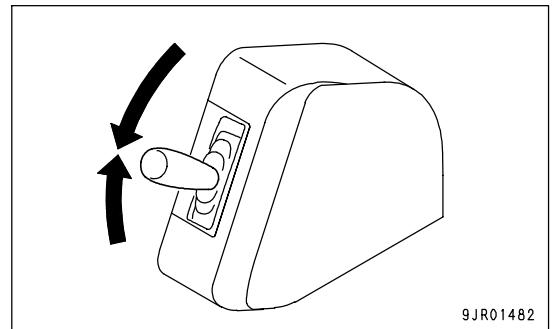
1. Check that there is no warning display on the machine monitor.



2. Fasten the seatbelt.
3. Check that dump lever (1) is at the FLOAT position and that the dump body pilot lamp is out.
If the dump body pilot lamp is lighted up, operate the dump lever to the HOLD position, then operate it to the FLOAT position to cancel the dump body HOLD condition.

REMARK

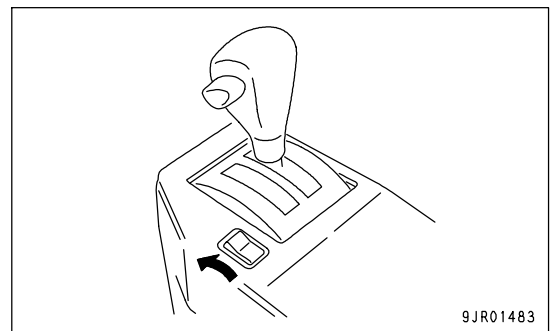
When the engine is started, the dump lever is at the FLOAT position, but the dump body is at HOLD.



4. Depressed the brake pedal fully. Then set parking brake switch (2) to the TRAVEL position to release the parking brake.

REMARK

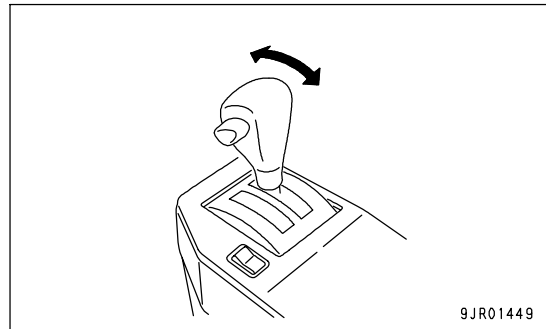
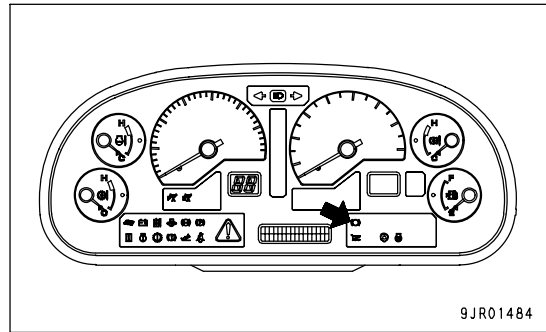
If the engine is stopped with the parking brake switch at TRAVEL, the parking brake will be applied automatically even though the parking brake switch is at TRAVEL. When starting the engine again, operate the parking brake switch to PARKING, and then move it back to TRAVEL to cancel the parking brake.



5. Check that retarder pilot lamp (3) is not lighted up, then set shift lever (4) to the desired position.

NOTICE

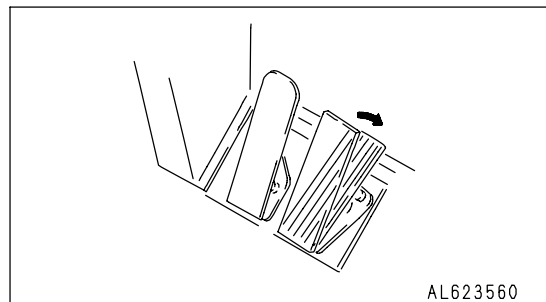
- When operating the shift lever, be sure to set it in position securely. If the lever is not placed in position properly, the shift position display on the panel may go out and the Transmission system caution lamp may light up.
- Always release the accelerator pedal before shifting from N to R or F.



6. Depress accelerator pedal (5) to move the machine off.

NOTICE

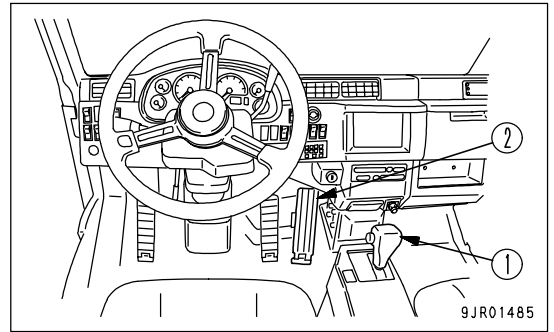
- If the shift lever is shifted to a position other than N when the parking brake has not been released, the central warning lamp will flash and the alarm buzzer will sound.
- If the shift lever is shifted to a position other than N when the dump lever is at a position other than FLOAT or the body is raised, the central warning lamp will flash and the alarm buzzer will sound.
- Do not operate the shift lever with the accelerator pedal depressed. The throttle is automatically throttled, but a big shock is generated, and will also reduce the service life of the machine.



MOVING MACHINE IN REVERSE

**WARNING**

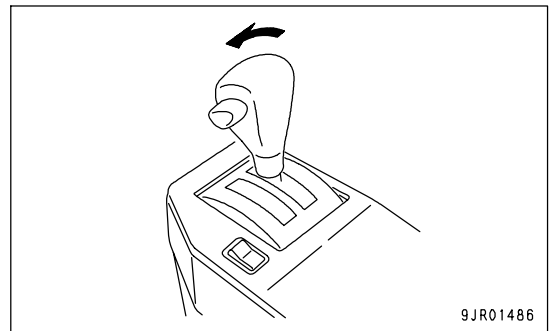
- When switching between FORWARD and REVERSE, check that the new direction of travel is safe.
There is a blind spot behind the machine, so use extreme caution when reversing the machine.
- Always stop the machine completely before shifting between FORWARD and REVERSE.



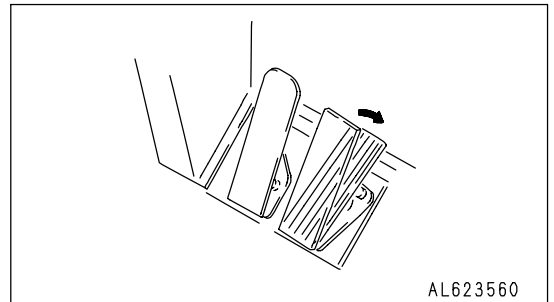
Place gear shift lever (1) in the R position, then gradually depress accelerator pedal (2) to move the machine off.

REMARK

- The machine cannot travel in reverse when the dump body is raised. Lower the dump body, set the dump lever to the FLOAT position, then set the gear shift lever to the R position.
- If the gear shift lever is operated to R when the machine is traveling forward (at a speed of more than 4 km/h (2.5 MPH)), the throttle is actuated and the transmission is set to neutral until the travel speed goes down.

**NOTICE**

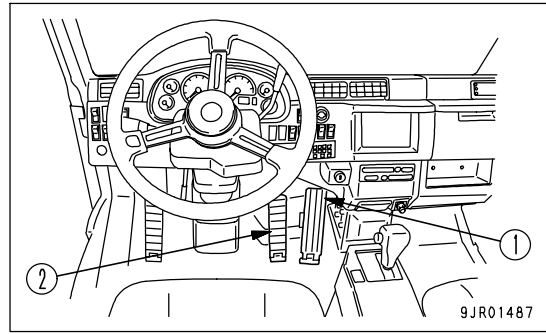
- When shifting between FORWARD and REVERSE, stop the machine completely, and run the engine at low idle when shifting the lever. After moving the gear shift lever, do not depress the accelerator until you detect that the transmission clutch has engaged.
- Do not operate the gear shift lever with the accelerator pedal depressed. This will cause a big shock, and will also reduce the service life of the machine.



STOPPING MACHINE

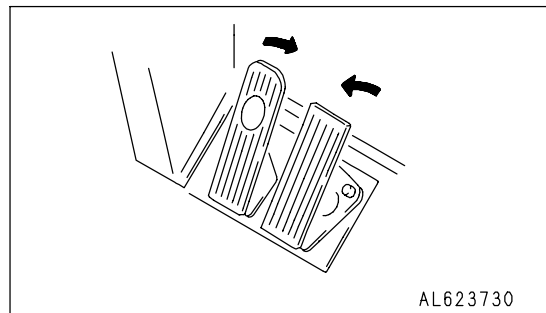
WARNING

- Avoid stopping suddenly. Give yourself ample room when stopping.
- If the foot brake is used repeatedly or is kept depressed for a long time, the brake may overheat and its life will be shortened.
- If the parking brake is used to stop the machine, the brake will be damaged. Do not use the parking brake except when stopping in emergencies or when parking the machine after stopping it.



NORMAL STOPPING

Release accelerator pedal (1), and depress brake pedal (2) to stop the machine.

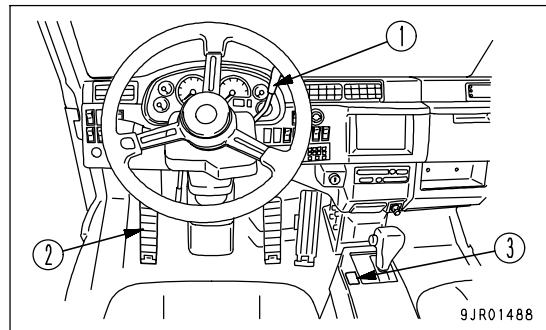


STOPPING IN EMERGENCY

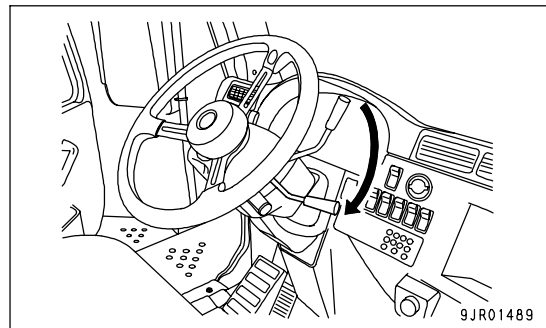
If there should be a failure in the foot brake, stop the machine as follows.

WARNING

- When the machine stops, put blocks under the tires immediately.
- Immediately after making an emergency stop, the brake disc will be at high temperature, so wait for it to cool down before carrying out repair or adjustment. Ask your Komatsu distributor for repair and adjustment.



1. Pull retarder control lever (1) fully to apply the retarder.

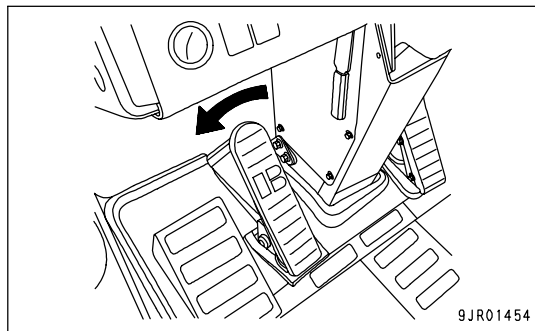


2. If operating only the retarder control lever gives insufficient braking force, depress emergency brake pedal (2) to stop the machine.

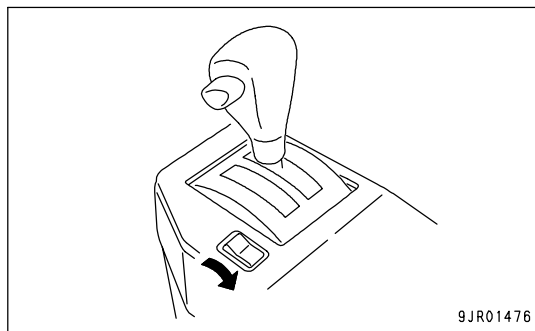
The emergency brake actuates both the front brake and the parking brake.

REMARK

If the machine is stopped with the emergency brake, the central warning lamp will flash and the alarm buzzer will sound. If this happens, return the gearshift lever to the N position to cancel the warning lamp and alarm buzzer.



3. When the machine stops, set parking brake switch (3) to the PARKING position.
4. If an emergency stop has been made, put blocks under the tires immediately, then try to find the cause, and repair it on site.

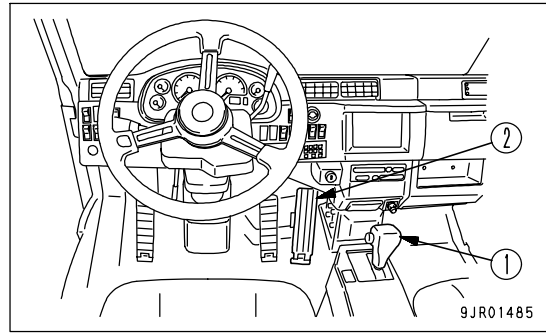


SHIFTING GEAR

When shifting gear, do as follows.

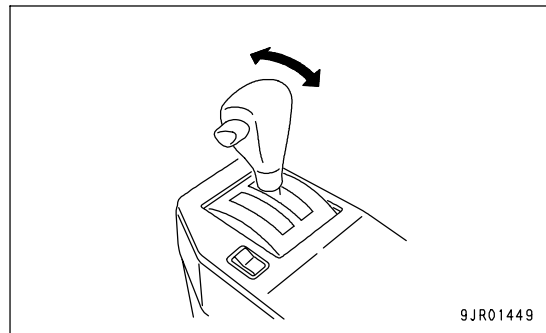
This machine has an automatic transmission, so set gear shift lever (1) to the desired position, and the transmission will automatically shift to a position to match the travel speed.

When the dump body is raised, if the shift lever is at the D position, the transmission is fixed in 2nd, and if it is at positions L - 6, the transmission is fixed in 1st. Keep the dump body lowered when traveling.



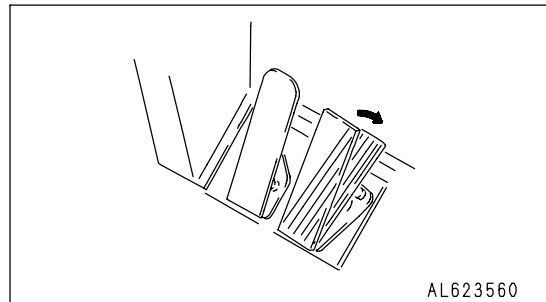
NOTICE

- When shifting between FORWARD and REVERSE, stop the machine completely, and run the engine at low idle when shifting the lever. After moving the shift lever, do not depress the accelerator until you detect that the transmission clutch has engaged.
- Do not operate the shift lever with the accelerator pedal depressed. The throttle is automatically throttled, but a big shock is generated, and will also reduce the service life of the machine.



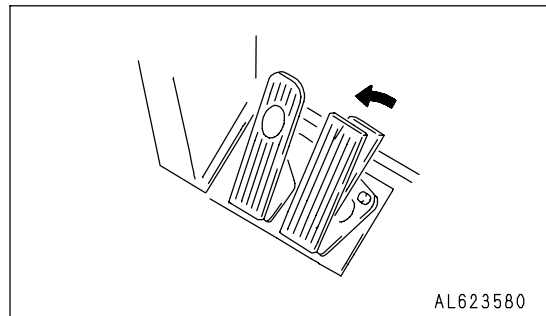
SHIFTING UP

1. When accelerator pedal (2) is depressed to accelerate the machine, the lockup clutch is engaged to shift the transmission to direct drive.
2. If the machine is accelerated further, the transmission will automatically shift up.



SHIFTING DOWN

If accelerator pedal (2) is released, the machine speed will be reduced, and the transmission will automatically shift down.



DOWN SHIFT INHIBIT

If the shift lever is operated when the machine is traveling, and the travel speed is faster than the maximum speed for each gear position, the transmission is not shifted immediately but is shifted down when the travel speed drops. This prevents overrunning of the engine.

SHIFTING DOWN WHEN USING FOOTBRAKE

When the foot brake is used to reduce the travel speed, if the machine is traveling with the transmission in the range from 2nd to 4th, the transmission will not shift down to a lower range until the travel speed goes down to the 2nd range or the brake is released. Maintaining the speed range reduces the speed when shifting, and this reduces the shock.

SKIP SHIFT

For normal gearshifting, the transmission shifts one gear range at a time.

When traveling uphill and the travel speed drops suddenly, the transmission jumps one gear range when shifting down to reduce the transmission shock.

OVERRUN PREVENTION DEVICE

If the engine tachometer enters the red range during operations, the alarm buzzer will sound and the central warning lamp will light up at the same time, so lower the engine speed and the travel speed. If the machine is accelerated to a speed higher than the maximum speed set for each range of the shift lever, the overrun prevention device is actuated to apply the retarder and reduce the travel speed.

TRAVELING DOWNHILL

When traveling downhill, travel at a safe speed which matches the width of the road, the condition of the road surface, and other conditions of the jobsite.

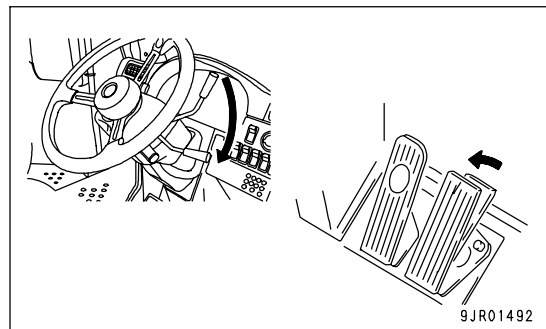
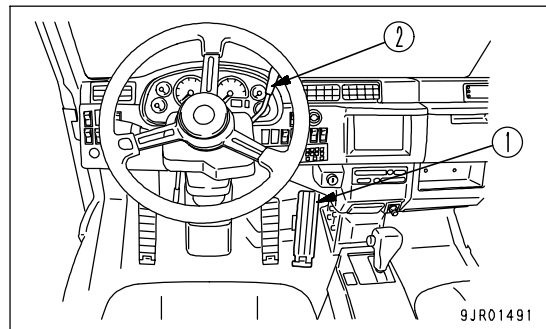
WARNING

- When the machine stops, put blocks under the tires immediately.
- For the maximum permissible speed when traveling downhill using the retarder, see the brake performance graph for the downhill distance and grade. Traveling continuously downhill at a speed greater than the maximum permitted speed on the brake performance graph is dangerous as the retarder brake may be damaged.
- If the retarder oil temperature caution lamp on the machine monitor lights up when the retarder is being used, shift down to travel downhill. (When this happens, the central warning lamp lights up and the alarm buzzer sounds.)
If the caution lamp does not go out even when the transmission is shifted down, stop the machine immediately, set the shift lever to the N position, run the engine at 2000 rpm, and wait for the caution lamp to go out.
- If the retarder loses its effect when it is used for traveling downhill, do as follows.
 1. Release the retarder control lever completely, then operate the retarder control lever again.
 2. If the retarder still has no effect even when the retarder control lever is operated again, return the retarder control lever completely to the released position, then depress the brake pedal to stop the machine, and contact your Komatsu distributor for repairs.
- Operate the retarder slowly. If the brake is applied suddenly, there is danger that the tires will slip.

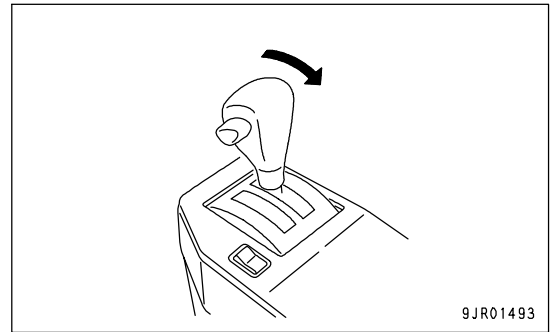
NOTICE

- If the retarder control lever is operated when traveling downhill, the transmission can be shifted down sooner than with normal deceleration. It is also possible to travel without shifting up.
- When traveling downhill, do not use the foot brake except in an emergency. Using the foot brake will cause overheating of the front brake and reduce the life.
- Do not accelerate or shift up when using the retarder. The engine speed will rise and this may cause the alarm buzzer to sound and the central warning lamp to flash.

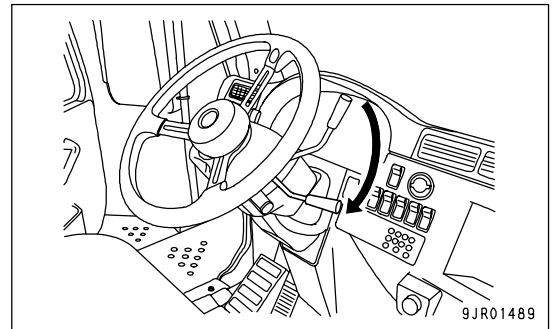
1. Before starting to travel downhill, release accelerator pedal (1) and operate retarder control lever (2) to slow the machine down.



2. Move the shift lever to a position (6, 5, 4, 3, 2) that matches the maximum permissible speed for the retarder brake performance.



3. When traveling downhill, operate retarder control lever (2), run the engine at a speed of at least 1800 rpm, and travel so that the retarder brake oil temperature gauge is in the white range.

**REMARK**

If the pedal is released when traveling downhill, the engine may make a peculiar noise, but there is no problem with quality or durability.

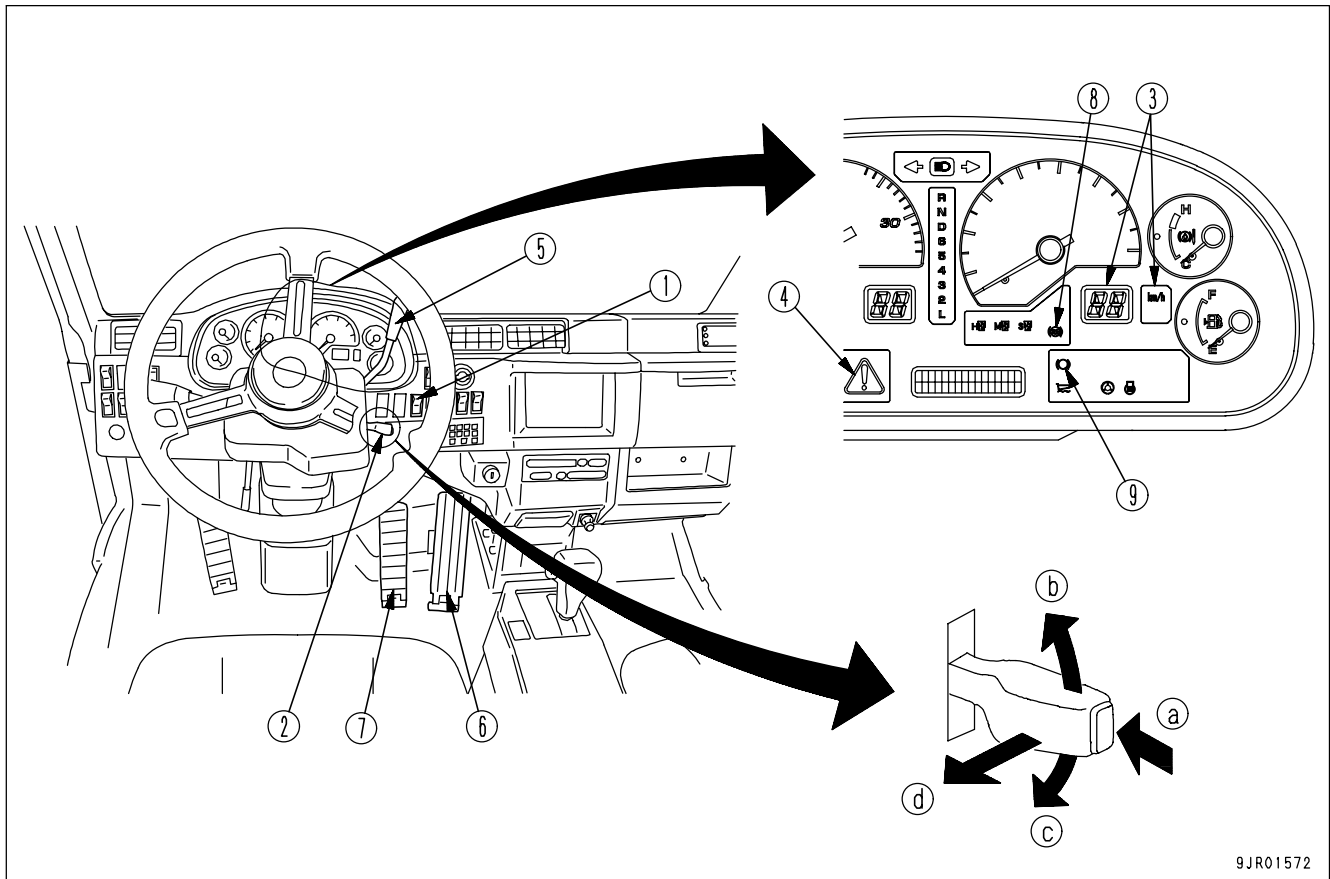
ARSC (AUTOMATIC RETARDER SPEED CONTROL)

When traveling downhill, if the switch is pressed at the speed that is to be maintained, the retarder is automatically actuated to prevent the travel speed from exceeding the set speed, so this makes retarder operations easy.

WARNING

- The ARSC system is actuated when the auto retarder (ARSC) switch is at the ON position.
Before starting to travel down a slope, check again that a suitable set speed is displayed on the auto-retarder set speed indicator and that the auto-retarder ready pilot lamp is lighted up.
- If the speed is set to a speed that exceeds the maximum permissible speed obtained from the brake performance graph, there is danger that there will be overheating and that the retarder brake may be damaged. Always set the speed so that it does not exceed the maximum permissible speed.
- When the ARSC is actuated on slippery road surfaces, the wheels may lock. If this happens, make less use of the ARSC.
- If any problem occurs in the system and braking cannot be carried out properly, the alarm sounds and the system is turned OFF to cancel the ARSC. If necessary, control the machine with the retarder control lever and foot brake to stop the machine in a safe place, then turn the auto retarder (ARSC) switch OFF.

EXPLANATION OF COMPONENTS



9JR01572

- | | |
|---------------------------------------|------------------------------------|
| (1) Auto retarder (ARSC) switch | (6) Accelerator pedal |
| (2) Auto retarder (ARSC) set lever | (7) Brake pedal |
| (3) Auto retarder set speed indicator | (8) Auto retarder READY pilot lamp |
| (4) Central warning lamp | (9) Retarder pilot lamp |
| (5) Retarder control lever | |

- (a) Set
- (b) Increase speed
- (c) Decrease speed
- (d) Cancel

AUTO RETARDER (ARSC) SWITCH

This switch (1) is used to turn the ARSC system ON/OFF.

AUTO RETARDER (ARSC) SET LEVER

This lever (2) is used in the following cases:

When setting the travel speed

When making fine adjustments to the set speed (tap up/tap down)

When canceling the speed setting

AUTO RETARDER SET SPEED INDICATOR

This display (3) shows the speed (km/h (MPH)) that has been set.

When the auto retarder (ARSC) switch is turned OFF, the display goes out.

It displays 0 when the set travel speed is canceled.

CENTRAL WARNING LAMP

This lamp (4) lights up if there is a serious problem in the ARSC system when the auto retarder (ARSC) switch is ON.

RETARDER CONTROL LEVER

Even when the ARSC is in operation, the retarder can be operated with this lever (5).

During operation of the ARSC, there is greater play when the lever starts to be pulled. If the retarder lever is operated suddenly (pulled too much), the brakes will be applied suddenly.

ACCELERATOR PEDAL

The ARSC is actuated only when the accelerator pedal (6) is not being pressed.

BRAKE PEDAL

This pedal (7) operates the wheel brake even when the ARSC is being operated.

AUTO RETARDER READY PILOT LAMP

When this lamp (8) is lighted up, it shows that operation of the ARSC is possible at the set travel speed. When it is out, the ARSC is not actuated.

It lights up for 3 seconds when the starting switch is turned ON to check the bulb.

RETARDER PILOT LAMP

This lamp (9) lights up when the retarder is operated, even when the ARSC is being operated.

METHOD OF OPERATION

ACTION OF ARSC SYSTEM

The ARSC system is actuated when the auto retarder (ARSC) switch is ON.

When the set switch of the auto retarder (ARSC) set lever is pressed, the travel speed at that point is set as the downhill travel speed. When traveling downhill, if the machine attempts to exceed the set travel speed, the retarder is automatically actuated.

The set travel speed is displayed on the auto retarder set speed indicator and is saved in memory.

If the accelerator is depressed during operation of the ARSC, the ARSC is canceled and the speed increases.

If the brake pedal or retarder control lever are operated while the ARSC is being operated, it is possible to reduce the speed or stop the machine in the same way as during normal operation of the brakes.

If the set travel speed is near the gear shifting point or there is a change in the grade of the slope, the transmission may shift (shift up or shift down) even when the ARSC is being operated.

The time taken for the machine travel speed to match the set speed may differ according to the grade of the slope. There may also be a slight difference between the set travel speed and the speed displayed on the speedometer.

METHOD OF SPEED SETTING



WARNING

If the speed is set to a speed that exceeds the maximum permissible speed obtained from the brake performance graph, there is danger that there will be overheating and that the retarder brake may be damaged. Always set the speed so that it does not exceed the maximum permissible speed.

If the actual machine speed during the setting operation is less than 10 km/h (6.2 MPH), the speed is set to 10 km/h (6.2 MPH). If it is higher than 55 km/h (34.2 MPH), it is set to 55 km/h (34.2 MPH). In all other cases, it is set to the actual travel speed.

The travel speeds that can be set depend on the selection of the gearshift lever as follows.

When the gearshift lever is at the D, 6, 5, 4, 3, 2, or L positions, the range for the set speed is 10 to 55 km/h (6.2 to 34.2 MPH).

It is impossible to set the speed when the gearshift lever is at the N or R positions.

METHOD OF CARRYING OUT FINE ADJUSTMENT OF SET TRAVEL SPEED

To raise the set travel speed 1 km/h (0.6 MPH), push the auto retarder (ARSC) set lever forward once.

To decrease the set travel speed 1 km/h (0.6 MPH), pull the auto retarder (ARSC) set lever back once.

REMARK

Release the auto retarder (ARSC) set lever after changing the set travel speed.

If the set switch and cancel are operated at the same time, the cancel operation is given priority.

If the set switch and tap up are operated at the same time, the tap up operation is given priority.

If the set switch and tap down are operated at the same time, the tap down operation is given priority.

The tap up and tap down operations are used for making fine adjustment of the set travel speed.

It is possible to adjust the set travel speed up to ± 5 km/h (3.1 MPH) when traveling in ARSC (when the accelerator pedal is released). When the accelerator pedal is being depressed, the ARSC is canceled, so it is possible to operate freely in a range from 10 to 55 km/h (from 6.2 to 34.2 MPH).

METHOD OF INCREASING SET TRAVEL SPEED

If it is desired to increase the set speed, depress the accelerator pedal to increase speed, and when the desired set travel speed is reached, press the set switch on the auto retarder (ARSC) set lever. The set travel speed will be changed to the new speed.

METHOD OF DECREASING SET TRAVEL SPEED

If it is desired to decrease the set speed, operate the retarder control lever to reduce speed, and when the desired set travel speed is reached, press the set switch on the auto retarder (ARSC) set lever. The set travel speed will be changed to the new speed.

REMARK

After using the retarder control lever to reduce the speed, return it to its original position.

If the lever is operated suddenly, the brakes will be applied suddenly.

TRAVELING AGAIN AT SET TRAVEL SPEED

If the machine repeatedly travels on the same slope, once the travel speed has been set, it is possible to operate the ARSC without carrying out the setting operation each time.

Before entering a downhill slope, if the travel speed has been adjusted to a speed lower than the set speed displayed on the auto retarder set speed indicator, the auto retarder READY pilot lamp lights and the ARSC is actuated when the accelerator pedal is released.

REMARK

When traveling at a speed greater than the set speed displayed on the auto retarder set speed indicator, the ARSC is not actuated even when the accelerator pedal is released. When this happens, the auto retarder READY pilot lamp also does not light up. Always adjust the travel speed to a speed lower than the set speed displayed on the auto retarder set speed indicator, and check that the auto retarder READY pilot lamp lights up.

Before starting to travel down a slope, check again that a suitable set speed is displayed on the auto-retarder set speed indicator and that the auto-retarder ready pilot lamp is lighted up.

METHOD OF CANCELING SET TRAVEL SPEED

Method 1: If the cancel operation is carried out for more than 1 second, the control is stopped. When this happens, the auto retarder set speed indicator shows 0.

Method 2: If the auto retarder (ARSC) switch is turned OFF, the control is canceled. When this happens, the auto retarder set speed indicator goes out.

REMARK

For Method 1, cancel operation must be continued for at least 1 second (different from other switches) to cancel the control. This is to prevent any problem of the control being canceled if the switch is touched by mistake.

RECOMMENDED SET TRAVEL SPEED

Set the travel speed so that the engine speed is at least 1800 rpm, and travel so that the retarder oil temperature gauge is in the white range.

If there is danger that the retarder oil may overheat, the set travel speed is automatically reduced 1 km/h (0.6 MPH) every 3 seconds. The lower value for the set travel speed when the speed is automatically reduced is 10 km/h (6.2 MPH).

BRAKE PERFORMANCE CURVE

HD465-7

- Method of using graph

Example: Machine equipped with exhaust brake

Downhill distance: 1500 m (4921 ft)

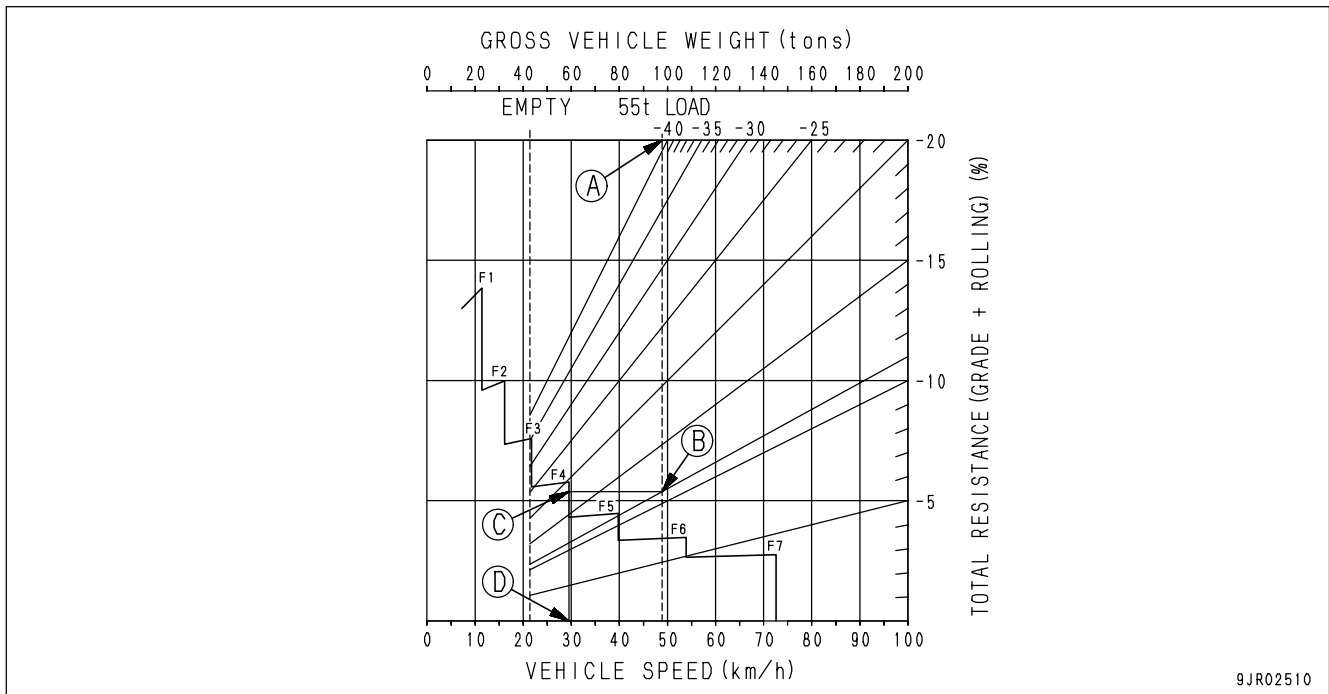
Travel resistance: -11% [grade resistance: -13%, rolling resistance: 2%]

Load: 55 tons

Obtain the maximum permissible speed and the transmission speed range from the graph when traveling downhill under the above conditions.

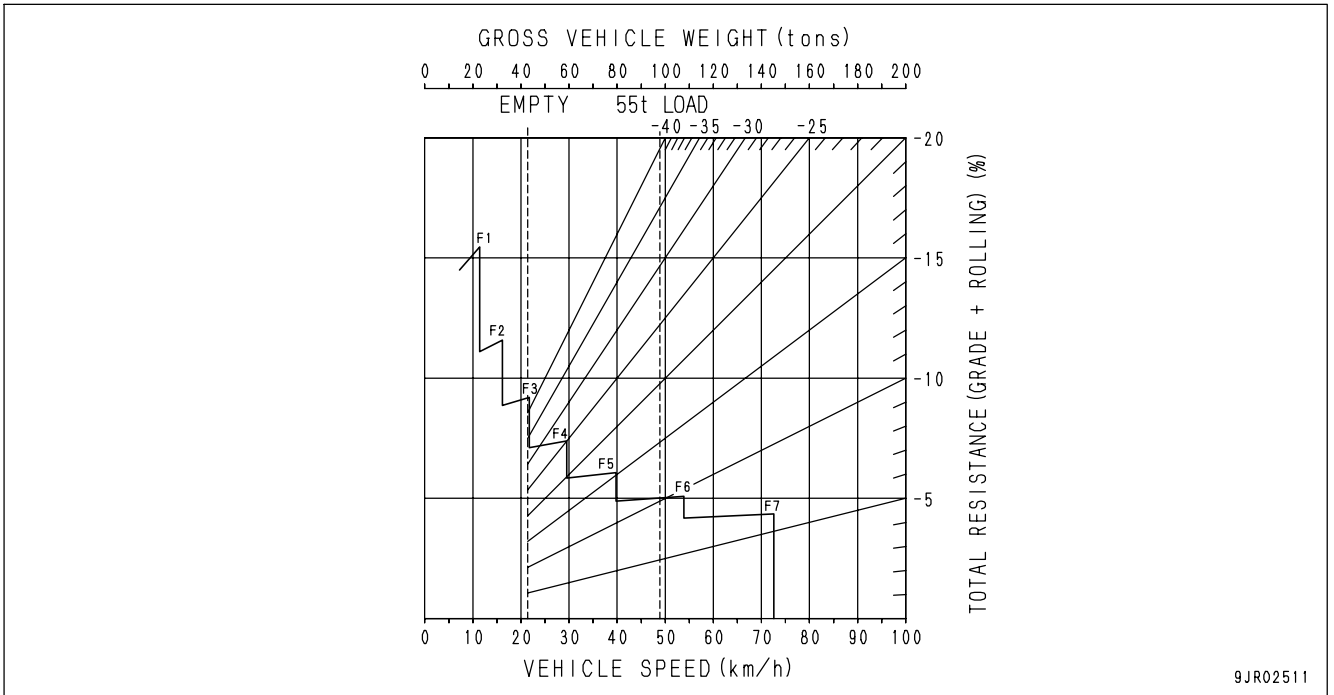
1. Use the brake performance graph for the downhill distance of 1,500 m (4,921 ft).
2. Starting from point (A) which corresponds to the overall weight of the machine, draw a perpendicular line down.
3. Take the point where it crosses the line for travel resistance -11% as (B) and draw a horizontal line.
4. Take the point where it crosses the performance curve as (C), and draw a perpendicular line down. Take the point where this line crosses the travel speed scale as (D).
5. As a result of the above, the following items change.
The maximum permitted speed changes from point (D) to 29.5 km/h (18.3 MPH)
The speed range changes from point (C) to F4

This maximum permissible speed is one guideline determined from the retarder brake performance, so on an actual jobsite, determine a safe travel speed below the maximum permissible speed to match the conditions of the jobsite so that the retarder brake oil temperature gauge is always in the white range when traveling.



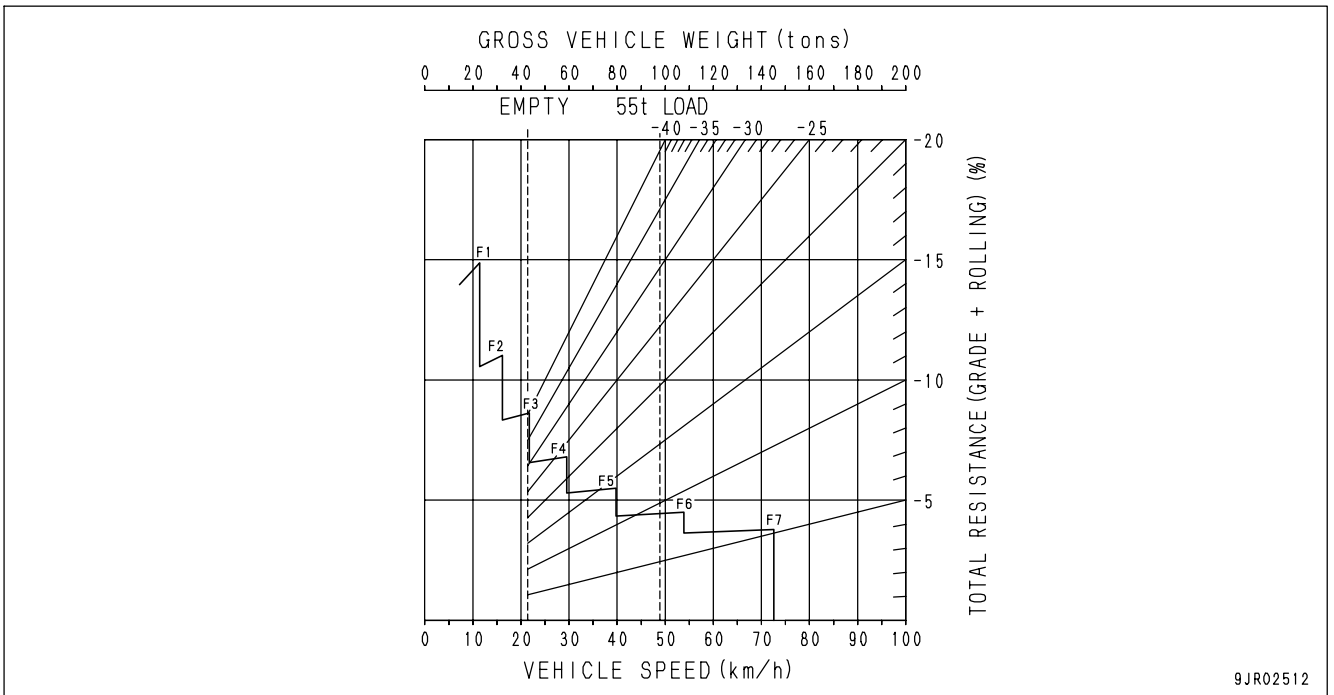
9JR02510

- Brake performance
[Downhill distance: 450 m (1,476 ft)]
(Tire size: 24.00-35-36PR)



9JR02511

- Brake performance
[Downhill distance: 600 m (1,968 ft)]
(Tire size: 24.00-35-36PR)

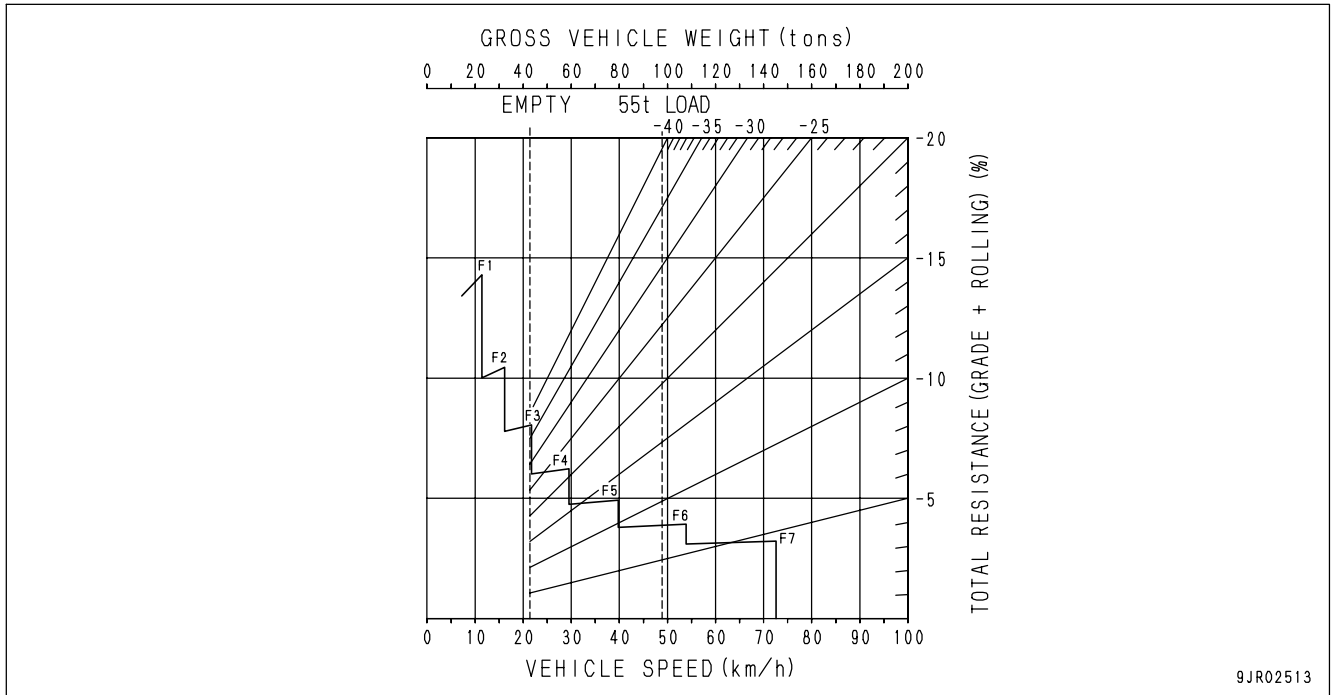


9JR02512

- Brake performance

[Downhill distance: 900 m (2,952 ft)]

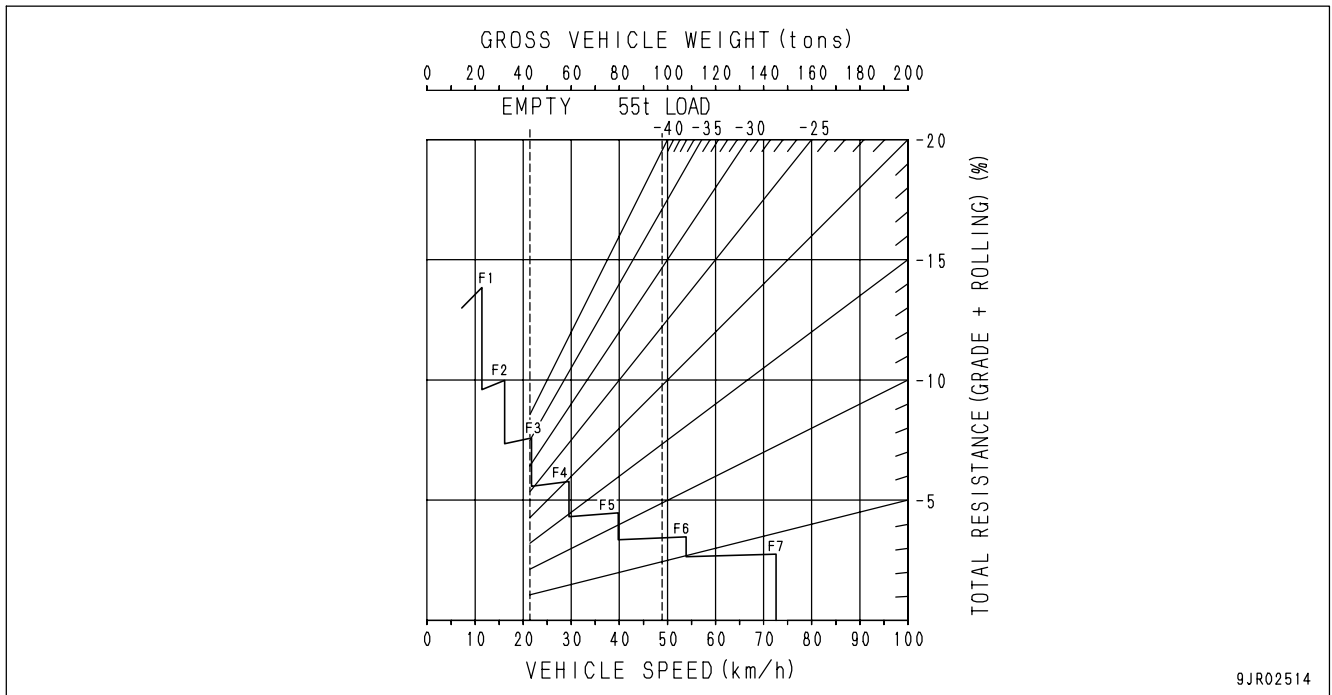
(Tire size: 24.00-35-36PR)



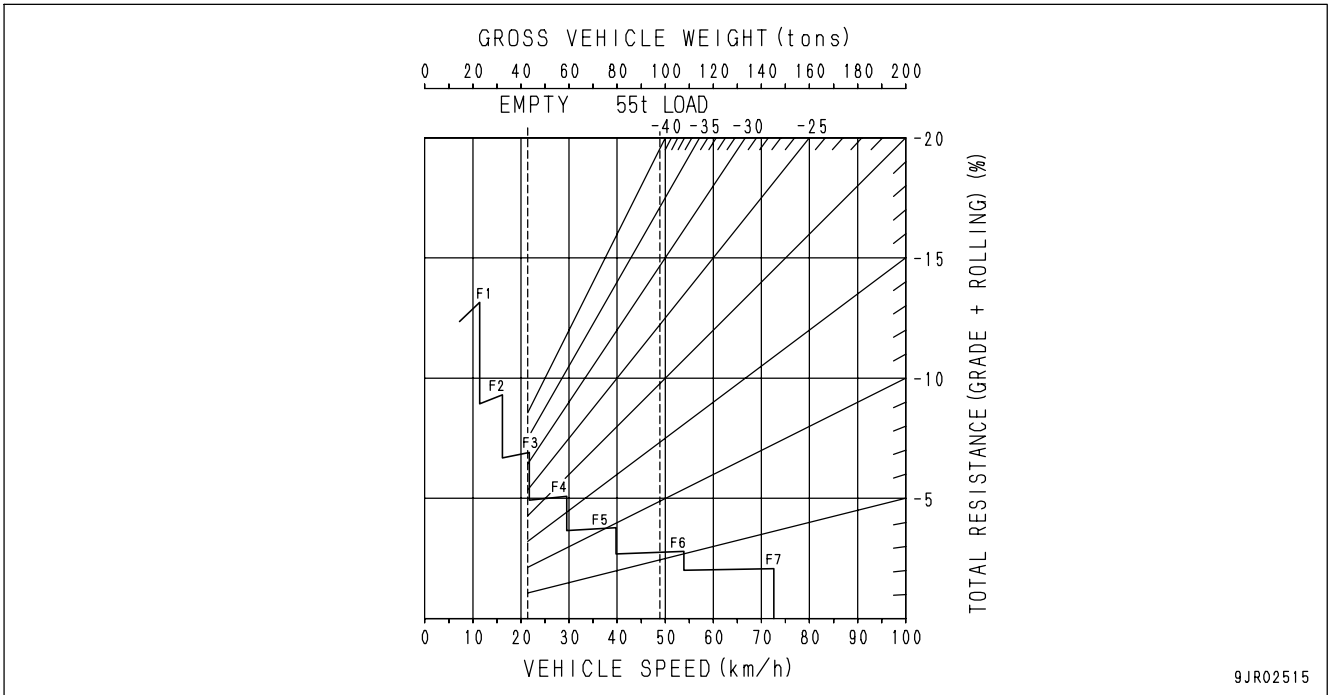
- Brake performance

[Downhill distance: 1,500 m (4,921 ft)]

(Tire size: 24.00-35-36PR)



- Brake performance
[Downhill distance: Continuous]
(Tire size: 24.00-35-36PR)



9JR02515

HD605-7

- Method of using graph

Example: Machine equipped with exhaust brake

Downhill distance: 1500 m (4921 ft)

Travel resistance: -11% [grade resistance: -13%, rolling resistance: 2%]

Load: 63 tons

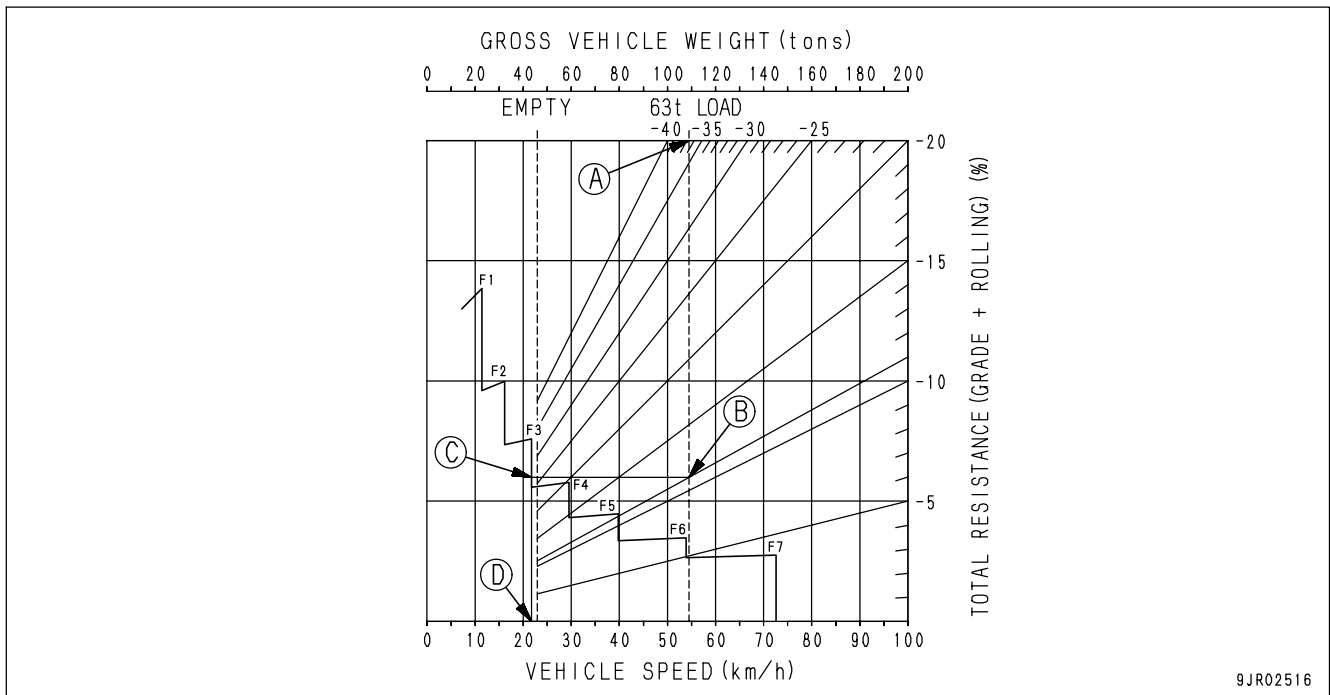
Obtain the maximum permissible speed and the transmission speed range from the graph when traveling downhill under the above conditions.

1. Use the brake performance graph for the downhill distance of 1500 m (4921 ft).
2. Starting from point (A) which corresponds to the overall weight of the machine, draw a perpendicular line down.
3. Take the point where it crosses the line for travel resistance -11% as (B) and draw a horizontal line.
4. Take the point where it crosses the performance curve as (C), and draw a perpendicular line down. Take the point where this line crosses the travel speed scale as (D).
5. As a result of the above, the following items change.

The maximum permitted speed changes from point (D) to 22.0 km/h (13.7 MPH)

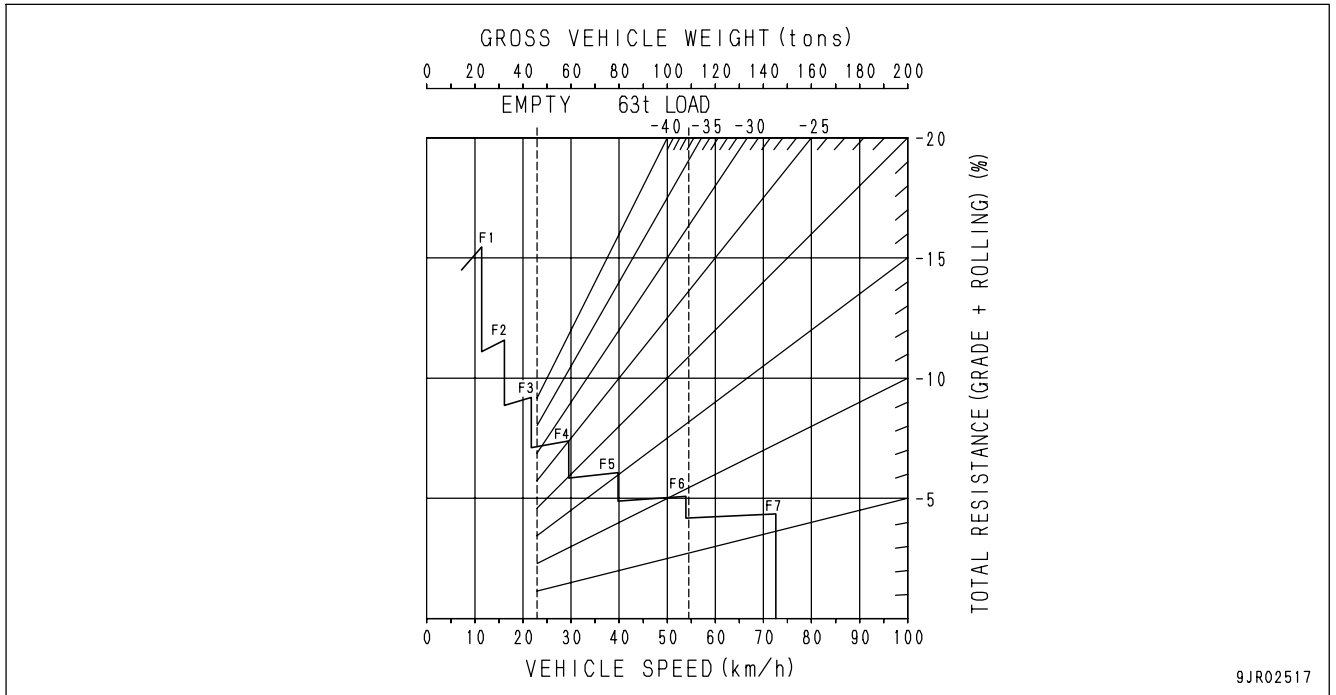
The speed range changes from point (C) to F3

This maximum permissible speed is one guideline determined from the retarder brake performance, so on an actual jobsite, determine a safe travel speed below the maximum permissible speed to match the conditions of the jobsite so that the retarder brake oil temperature gauge is always in the white range when traveling.



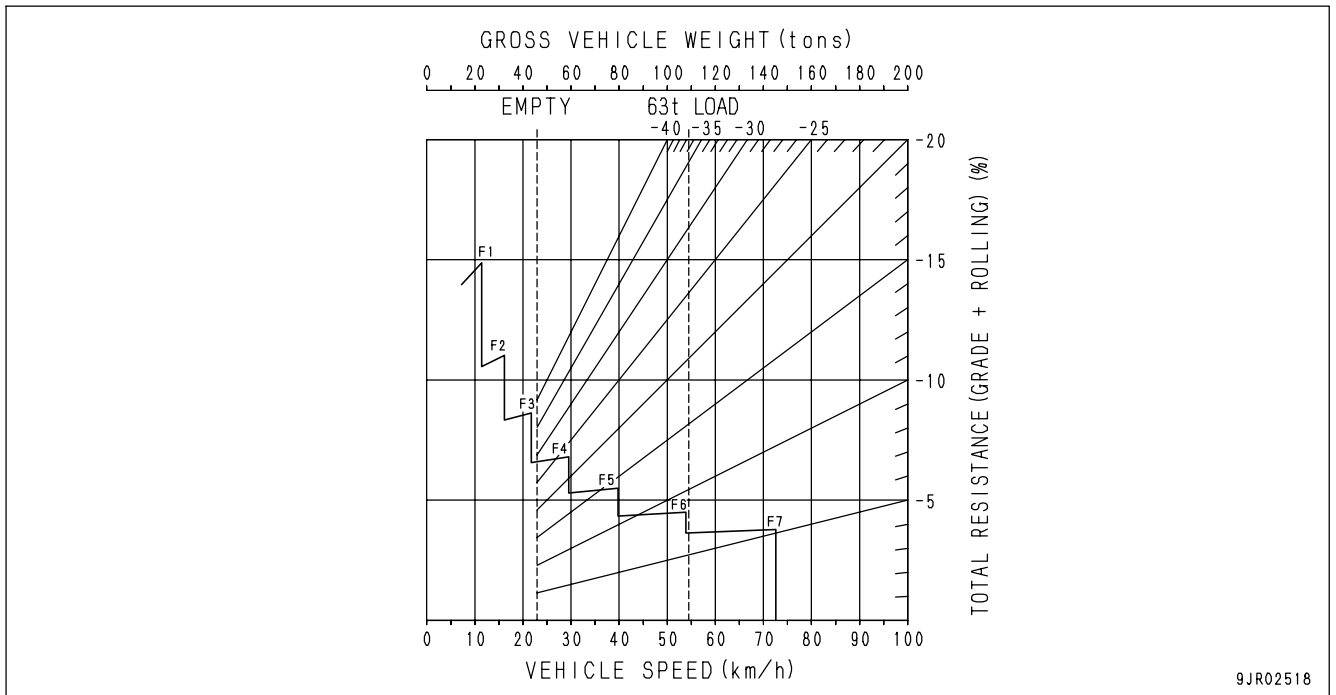
9JR02516

- Brake performance
 [Downhill distance: 450 m (1,476 ft)]
 (Tire size: 24.00R35★★)



9JR02517

- Brake performance
 [Downhill distance: 600 m (1,968 ft)]
 (Tire size: 24.00R35★★)

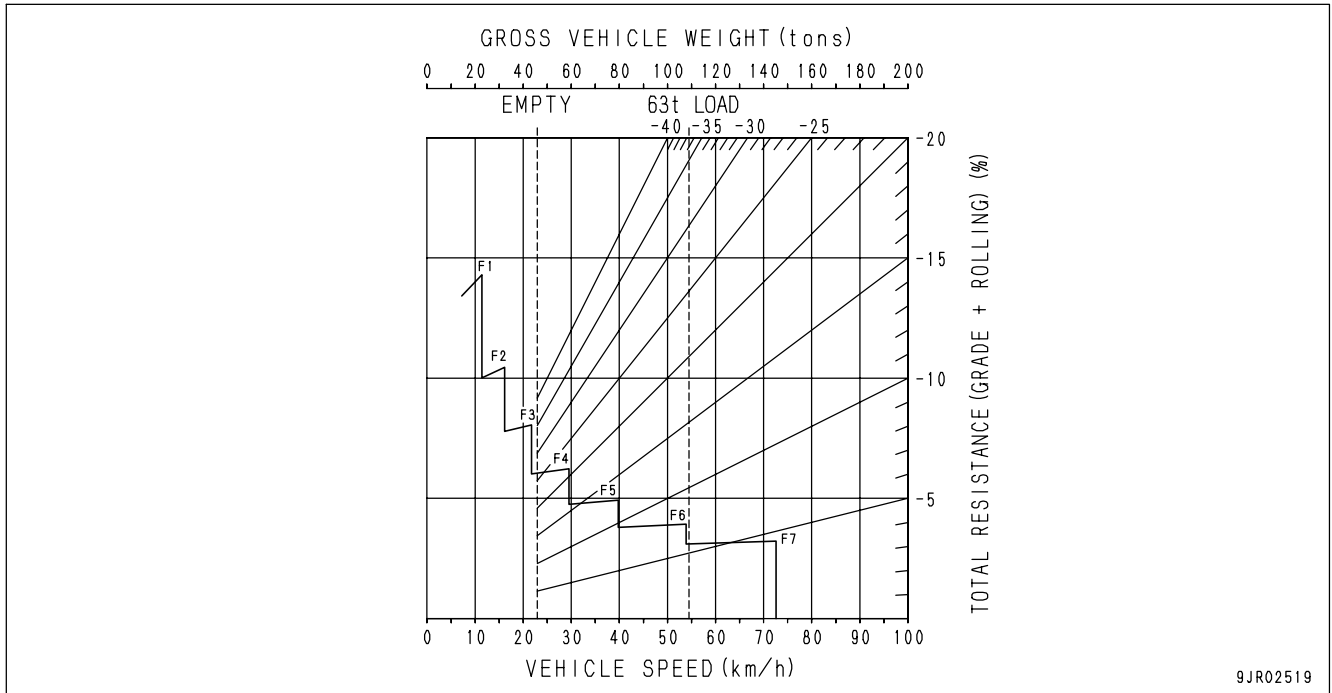


9JR02518

- Brake performance

[Downhill distance: 900 m (2,952 ft)]

(Tire size: 24.00R35★★)

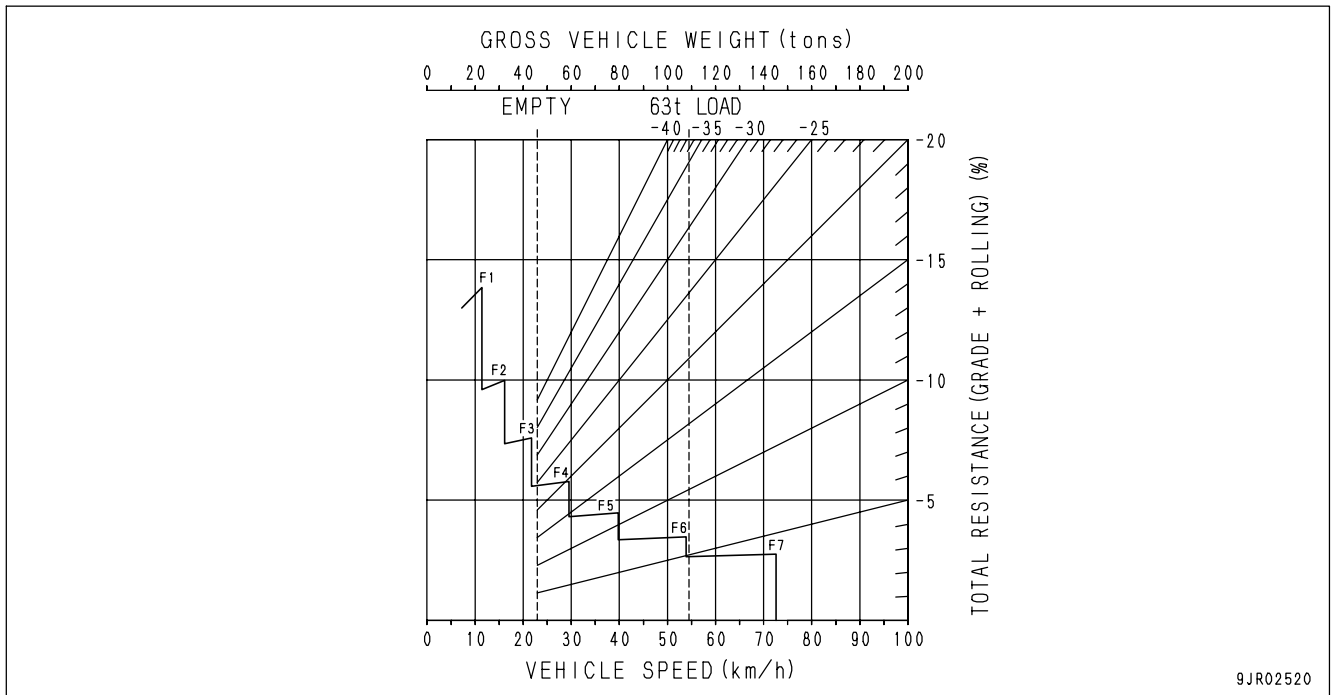


9JR02519

- Brake performance

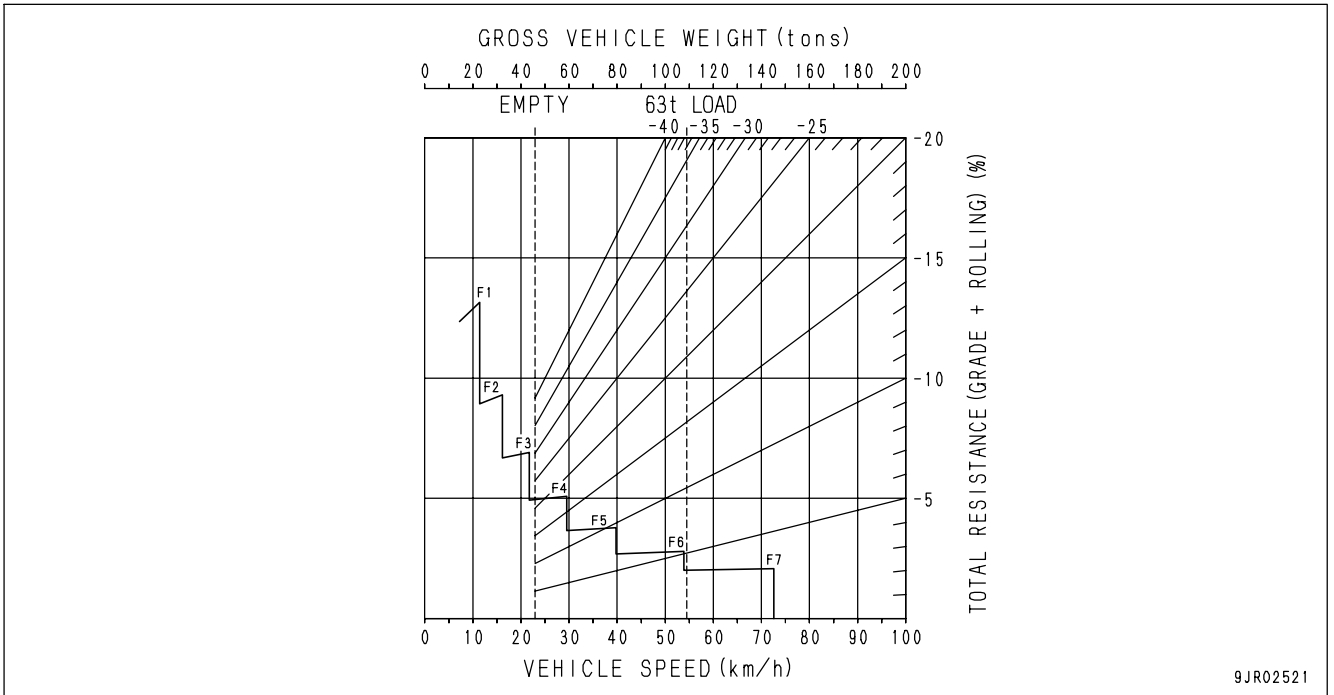
[Downhill distance: 1,500 m (4,921 ft)]

(Tire size: 24.00R35★★)



9JR02520

- Brake performance
[Downhill distance: Continuous]
(Tire size: 24.00R35 ★ ★)



9JR02521

STEERING THE MACHINE



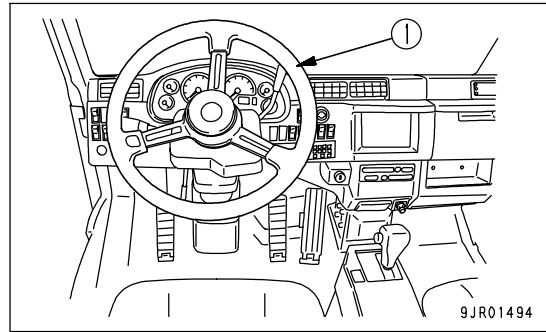
WARNING

If the machine is turned at high speed or on a steep slope, there is danger that it will turn over, so do not operate the steering in such conditions.



CAUTION

Do not continue to apply force to the steering wheel when it has been turned fully to the left or right. This will make the oil temperature in the circuit rise and will cause overheating.



To turn the machine when traveling, turn steering wheel (1) in the direction of the turn.

When traveling around a curve, release the accelerator pedal before entering the curve, shift down to a lower speed range, then depress the accelerator pedal to travel around the curve. Never coast around the curves at high speed.

REMARK

- The angle of the steering wheel may change (the position of the spoke may change slightly) when the machine is traveling, but this is not a failure.
- If force is applied to the steering wheel when the tires have been turned fully to the left or right, the steering wheel will turn a little at a time, but this is not a failure.

LOADING OPERATIONS

When using a large wheel loader to load large rocks, if the rocks are loaded directly into the dump body parts of the dump body may be deformed. To prevent this, when loading large rocks, first load sand or soil to act as a cushion, then load the rocks on top of this to reduce the impact on the dump body.

In addition, when loading rocks that exceed the following conditions, install the optional dump body reinforcement plate.

- Rocks with one side over 0.5 m (1 ft 8 in)
- Rocks of hardness more than 4.5 (Mohs scale)
- Rocks with a weight of more than 300 kg (662 lb)
- When transporting steel ingots

For the types and the selection of the dump body, see "SELECTING DUMP BODY (PAGE 6-2)". (HD465-7 only)

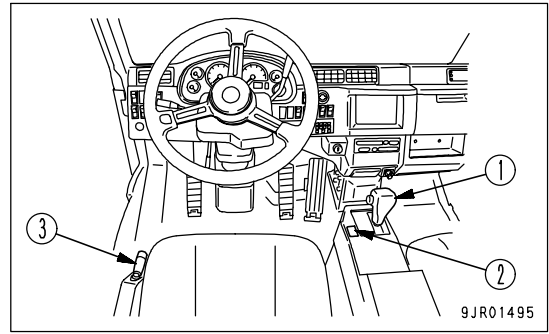
NOTICE

- When traveling, always set the dump lever to the FLOAT position regardless of whether the dump body is empty or loaded.
- If the dump lever is not at the FLOAT position and the shift lever is not at the N position, the central warning lamp will flash and the alarm buzzer will sound.

DUMP OPERATIONS

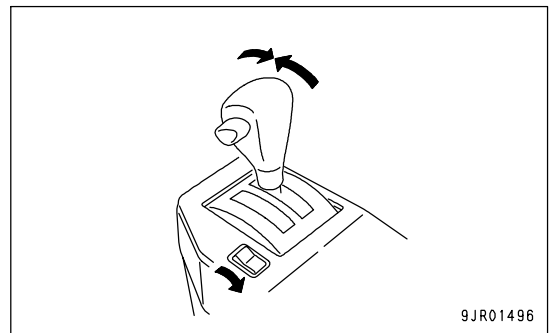
WARNING

- When dumping a load, always carry out the dumping operation in accordance with the signals from the flagman.
- When dumping large rocks, operate the dump body slowly.
- Do not load the dump body while it is still raised.
- When carrying out inspection with the dump body raised, always use the safety pins, set the dump lever to the HOLD position and lock with the safety lock knob. For details, see "SAFETY PIN (PAGE 3-44)".

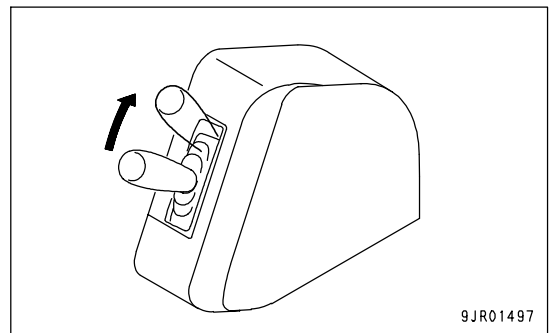


Operate the dump body as follows.

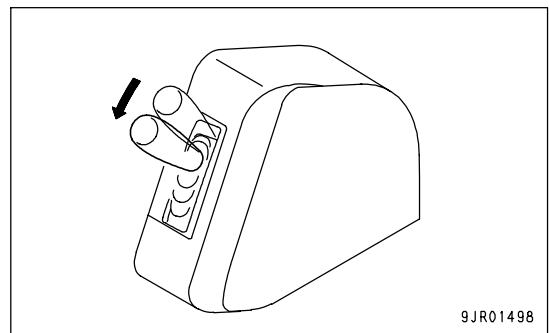
1. Place shift lever (1) at the N position, and set parking brake switch (2) to the PARKING position.



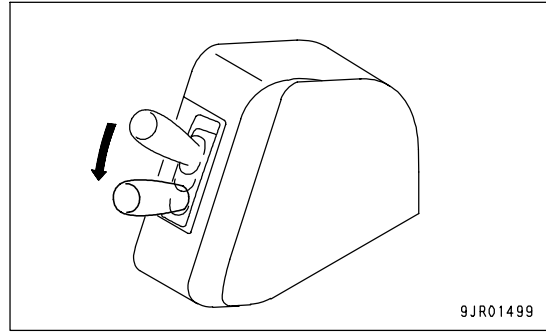
2. Move dump lever (3) to the RAISE position, then depress the accelerator pedal to raise the dump body.
If the dump lever is released when it is at the RAISE position, it is held at the RAISE position and the dump body will continue to rise.
The dumping speed increases in proportion to the engine speed.



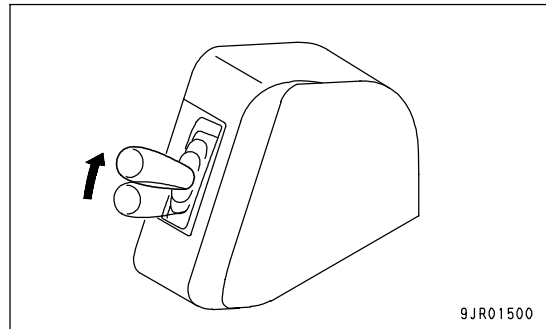
3. When the dump body rises to the previously set position, dump lever (3) returns to the HOLD position. The dump body is held at that position.
If it is necessary to raise the dump body further, operate dump lever (3) to the RAISE position and the dump body will rise. If dump lever (3) is released, dump lever (3) will return to the HOLD position and the dump body will stop at that position.



4. When dump lever (3) is moved to the LOWER position, the dump body will start to move down.



5. When the dump body has moved down a certain distance, move dump lever (3) to the FLOAT position. (When the lever is released, it will return to the FLOAT position.) The dump body will then move down under its own weight.



NOTICE

- If the dump lever is not at the FLOAT position and the shift lever is not at the N position, the central warning lamp will light up and the alarm buzzer will sound.
- When raising the dump body, let the accelerator pedal back near the maximum angle to avoid any impact load on the hydraulic circuit or hoist cylinders.
- When the dump body is raised, if the shift lever is at the D position, the transmission is fixed in 2nd, and if it is at positions L to 6, the transmission is fixed in 1st. Keep the dump body lowered when traveling.

The dump control is carried out electrically. If there is any problem in the sensors or valves, a failure code is displayed and the dump body is held in position. If it is desired to move the dump body forcibly for inspection or repair, please ask your Komatsu distributor to carry out the operation.

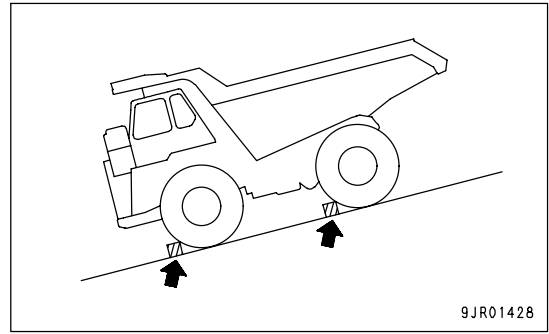
PRECAUTIONS FOR OPERATION

- When traveling on roads in rain or snow, or when traveling on muddy or soft ground, consider the loaded condition of the machine and be extremely careful not to let the tires slip or the machine spin and sink into the ground.
- If the engine should stop when the machine is traveling, stop the machine immediately, then move the gear shift lever to the N position, and start the engine again.
- If the central warning lamp and pilot lamp for any EMERGENCY item on the machine monitor should flash and the buzzer sounds during operation, stop the machine immediately and investigate the cause. For details, see "TROUBLESHOOTING (PAGE 3-125)".
- When loading, be careful to load the dump body uniformly, and be particularly careful to avoid loading too much at the front.
- On slippery road surfaces, apply the retarder control lever slowly and shift the transmission down to prevent the rear wheels from locking.
- When traveling through pools of water, water may get inside the front brakes and cause a big drop in the braking force, so drive carefully in such areas. If water should get into the brakes, apply the brakes several times while traveling to produce friction heat between the pad and disc to remove the water.

PARKING MACHINE

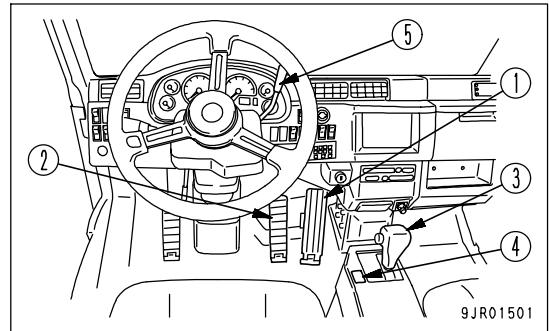
! WARNING

- Avoid stopping suddenly. Give yourself ample room when stopping.
- Park the machine on firm, horizontal ground.
Do not park the machine on a slope.
If it is unavoidably necessary to park the machine on a slope, put blocks under the tires to prevent the machine from moving.
- If the shift lever is touched by mistake, the machine may move suddenly, and this may lead to a serious injury or death. Before standing up from the operator's seat, always set the parking brake switch securely to the PARKING position.
- The retarder must not be used as a parking brake.
- Do not use the retarder for long-term parking, regardless of the engine speed.

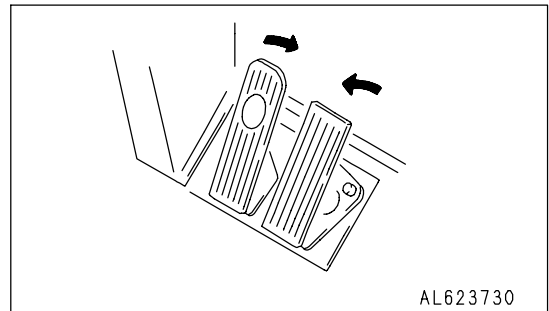


! CAUTION

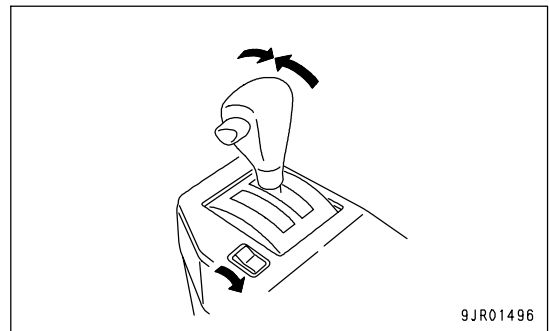
To prevent damage to the parking brake, apply the parking brake only when parking the machine.



1. Release accelerator pedal (1), then depress brake pedal (2) to stop the machine.



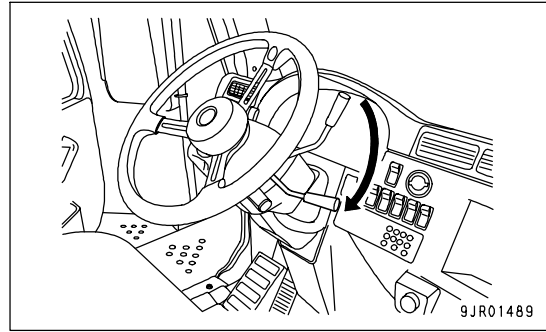
2. Move shift lever (3) to the N position, then set parking brake switch (4) to the PARKING position to apply the parking brake.



3. When in the operator's compartment, pull retarder control lever (5) fully to apply the retarder.

NOTICE

- The retarder must not be used as a parking brake.
- Do not use the retarder for long-term parking, regardless of the engine speed.

**CHECKS AFTER COMPLETION OF WORK**

Use the machine monitor to check the engine water temperature, engine oil pressure, and fuel level. If the engine has overheated, do not stop the engine suddenly. Run it at a mid-range speed to cool it gradually before stopping.

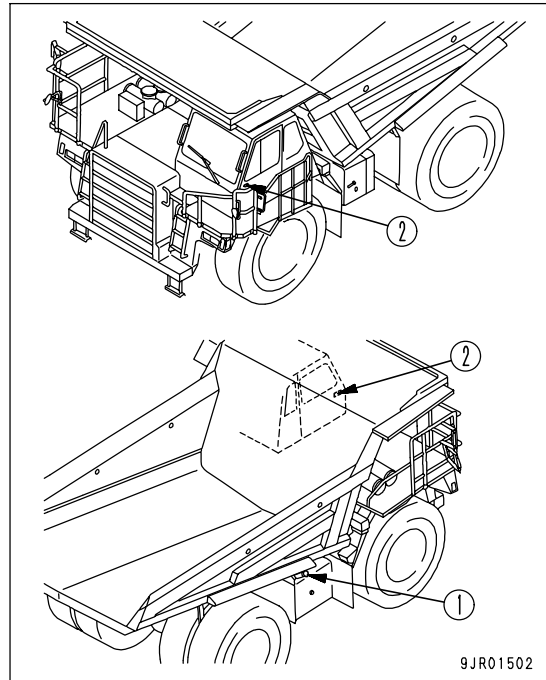
LOCKING

Always lock the following places.

- (1) Fuel filler cap of fuel tank
- (2) Cab door (left, right)

REMARK

The starting switch key is used for locking places (1) and (2).



HANDLING TIRES

PRECAUTIONS WHEN HANDLING TIRES

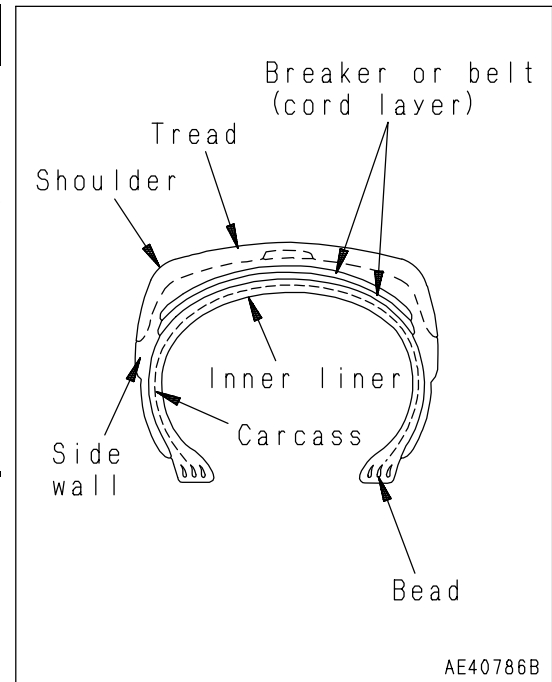


WARNING

To ensure safety, the defective tires given below must be replaced with new tires.

- Tires where the bead wire has been cut, broken, or greatly deformed
- Excessively worn tires where more than 1/4 of the circumference of the carcass ply (excluding the breaker) is exposed
- Tires where damage to the carcass exceeds 1/3 of the tire width
- Tires where ply separation has occurred
- Tires where radial cracks extend to the carcass
- Tires where there is abnormal deterioration, deformation, and damage, and the tire cannot withstand use.

Please contact your Komatsu distributor when replacing the tires. It is dangerous to jack up the machine without taking due care.



AE40786B

T.Km.P.H (Ton-Km-Per-Hour Rating)

Tires for construction equipment are used under severe conditions that bear no comparison with the tires used on cars, buses, or ordinary trucks, so they are specially designed to withstand these conditions.

Compared with ordinary tires, far greater heat is produced in the rubber internal parts of off-road tires when the machine is traveling. If they are used continuously under conditions which exceed the permitted load and travel speed of the tire, the internal temperature will exceed the limit, and the rubber may become soft and heat separation occur.

To prevent such problems from occurring, the T.Km.P.H. is used as a standard to allow the machine to travel safely. If operations are carried out which exceed the T.Km.P.H. of the tire (when the T.Km.P.H. of the work exceeds the T.Km.P.H. of the tires), tire trouble will occur more frequently. In such cases, do as follows.

- Make the operating conditions easier so that the operation T.Km.P.H. of the work is lowered.
- Increase the size of the tires to a tire with a high T.Km.P.H.

TIRE T.Km.P.H.AND MAXIMUM SPEED FOR CONTINUOUS TRAVEL (REFERENCE)

- HD465-7

	Tire T.Km.P.H.for ambient temperature				Max.speed for continuous travel for ambient temperature (km/h)				
	16°C	27°C	38°C	49°C		16°C	27°C	38°C	49°C
Size 24.00-35-36PR (standard) structure CR Code No. E3 (TRA)	335	313	292	270	When empty (front wheel standard)	37	35	33	30
					When loaded (rear wheel standard)	23	22	20	19
Size 24.00R35 ★ ★ (if equipped) structure CR Code No. E4 (VRLSA)	396	355	314	293	When empty (front wheel standard)	35.1	31.4	27.8	25.9
					When loaded (rear wheel standard)	21.5	19.3	17.0	15.9

- HD605-7

	Tire T.Km.P.H.for ambient temperature				Max.speed for continuous travel for ambient temperature (km/h)				
	16°C	27°C	38°C	49°C		16°C	27°C	38°C	49°C
Size 24.00R35 ★ ★ (standard) structure CR Code No. E4 (VRLSA)	396	355	314	293	When empty (front wheel standard)	35.1	31.4	27.8	25.9
					When loaded (rear wheel standard)	21.5	19.3	17.0	15.9
Size 24.00-35-48PR (if equipped) structure CR Code No. E3 (TRA)	335	313	292	270	When empty (front wheel standard)	37	35	33	30
					When loaded (rear wheel standard)	23	22	20	19

METHOD OF CALCULATING WORK T.Km.P.H.

Work T.Km.P.H. = average load per tire x average travel speed for one day

Average travel speed = round trip distance x number of round trips per day/total operating hours per day

Average load = (load when empty + load when loaded) /2

The total operating hours per day includes the stopping time and rest periods.

* The T.Km.P.H. in the table may differ slightly according to the tire maker, so concerning operations which require travel near the travel speed given in the table, consult your Komatsu distributor.

PRECAUTIONS FOR LONG DISTANCE TRAVEL

If the machine travels continuously at high speed for a long distance, there will be a marked increase in the generation of heat in the tire. This may cause premature damage to the tire, so be careful of the following points.

- Travel only when empty.
- Check the tire inflation pressure before starting for the day when the tires are cold, and adjust to the following inflation pressure.
- Do not reduce the tire inflation pressure when traveling.
- HD465-7

Tire size	Inflation pressure
24.00-35-36PR (standard)	0.47 MPa (4.75 kgf/cm ² , 67.4 PSI)
24.00R35 ★ ★ (if equipped)	0.69 MPa (7.00 kgf/cm ² , 99.4 PSI)

- HD605-7

Tire size	Inflation pressure
24.00R35 ★ ★ (standard)	0.69 MPa (7.00 kgf/cm ² , 99.4 PSI)
24.00-35-48PR (if equipped)	0.64 MPa (6.50 kgf/cm ² , 92.3 PSI)

NOTICE

If the tires are used when the inflation pressure is less than the value given in the table above, the rim may be damaged.

Always keep the tire inflation pressure within +0 to +0.03 MPa (0.3 kgf/cm², 4.3 PSI) of the value in the table above.

- The maximum travel speed must be kept to less than 40 km/h (24.9 MPH). Stop for at least one hour for every one hour of travel to allow the tires and other components to cool down.
- Never travel with water or dry ballast in the tires.

DETERMINING AND MAINTAINING TRAVEL ROAD

Determining and traveling the road in the jobsite is an extremely important factor both for reasons of safety and for reducing the cycle time. To ensure safety in operations, do as follows.

DETERMINING TRAVEL ROAD

- As far as possible, restrict the travel road to one-way travel.
- If it is impossible to keep to one-way traffic, make the road with ample width to enable trucks traveling in opposite directions to pass each other. If it is impossible to provide a sufficient road width, provide passing places at various points along the road.
- Always design the road so that the loaded truck passes on the side closest to the hill face.
- If there are curves with poor visibility along the road, set up mirrors.
- In places where the road shoulder is weak or likely to collapse, set up a sign at a point at least 1.5 m (4 ft 11 in) from the road shoulder to warn of the danger.
- It is important to set up lighting or reflectors to enable the road to be traveled at night.
- The grade of slope should be kept within 10% (approx. 6°) as far as possible, and emergency escape points should be set up on downhill slopes in case of any brake failure.
- Make the road as straight as possible, and particularly in intermediate areas with curves, where the machine is traveling at high speed, make the radius of the curve as large as possible.
- Small S curves are particularly dangerous, so avoid such curves. The radius of the curve must be a minimum of 12 to 15 m (39 ft 4 in to 49 ft 3 in).
- Make the radius of curves as large as possible.
- Make the road wider at curves than it is in straight areas.
- Make the outside of the curve slightly higher.
- Be particularly careful to strengthen the road shoulder on the outside of curve.
- As far as possible, design the road so that no other roads cross it. In particular, if roads cross at an angle on slopes, a stepped difference is formed in the road. This is extremely dangerous, as it causes the machine to roll when traveling at high speed.
- Cut the slope face to provide a special road for the trucks.

MAINTAINING TRAVEL ROAD

Carry out the necessary action according to the conditions to insure that the road can always be traveled safely.

- Remove any unevenness in the travel surface, sloping to the left or right, or drooping of the road shoulder. Make the road of ample strength and remove such obstacles as rocks and tree stumps.
- Maintain the road from time to time with a bulldozer or motor grader.
- Spray the road with water at suitable intervals to prevent dust from rising and reducing the visibility.

TRANSPORTATION

PRECAUTIONS WHEN TRANSPORTING

Always obey the traffic regulations when transporting the machine by road.



WARNING

This machine must be disassembled for transportation. When transporting the machine, please consult your Komatsu distributor.

STEPS FOR TRANSPORTATION

As a basic rule, always transport the machine on a trailer.

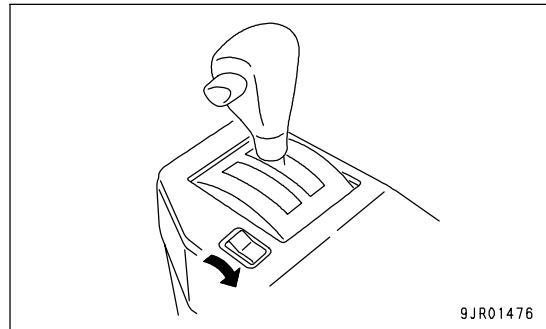
When selecting the trailer, see the weights and dimensions given in "SPECIFICATIONS (PAGE 5-2)".

Note that the specifications for the weights and dimensions for transportation differ according to the type of tires and type of dump body.

METHOD OF SECURING MACHINE

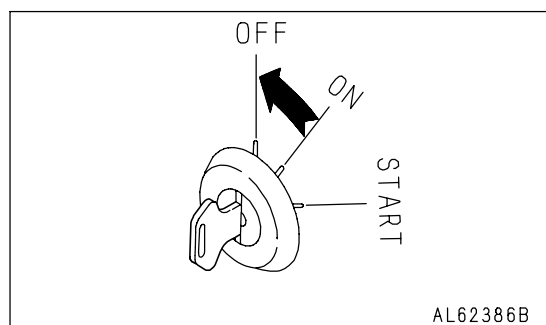
After loading the machine in the specified position, secure it in place as follows.

1. Set the parking brake switch to the PARKING position to apply the parking brake.

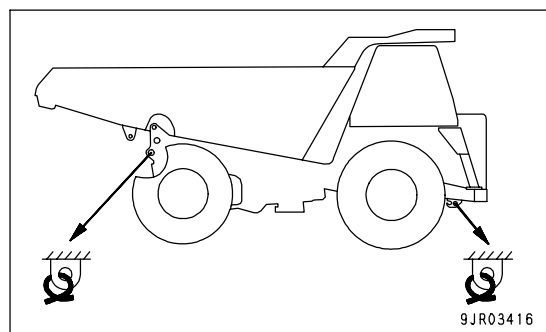


2. Turn the key in the starting switch to the OFF position to stop the engine.

3. Remove the key from the starting switch.



4. To prevent the machine from moving during transportation, insert blocks under the front and rear of each tire and secure the machine firmly in position with chains or wire rope. Be particularly careful to secure the machine firmly so that it does not slide to the side.



NOTICE

Always retract the antenna and reassemble the mirrors so that they are within the width of the machine.

METHOD OF LIFTING MACHINE

When lifting the machine at a port or any other place, always use the following procedure to lift it.



WARNING

- The operator carrying out the lifting operation using a crane must be a properly qualified crane operator.
- Never raise the machine with any worker on it.
- Always make sure that the wire rope is of ample strength for the weight of this machine.
- When lifting, keep the machine horizontal.
- Always stop the engine and apply the brake before starting the lifting operation.
- Never enter the area around or under the machine when it is raised.

Never try to lift the machine in any posture other than the posture given in the procedure below or using lifting equipment other than in the procedure below.

There is a hazard that the machine may lose its balance.

NOTICE

This method of lifting applies to the standard specification machine.

The method of lifting differs according to the attachments and options installed.

For details of the procedure for machines that are not the standard specification, please consult your Komatsu distributor.

For the weight of the standard specification machine, see "SPECIFICATIONS (PAGE 5-2)"

NOTICE

- Use protectors to prevent the wire rope from being cut on sharp corners and to prevent the wire rope from cutting into the machine bodywork.
- When using a spreader bar, select an ample width to prevent contact with the machine.

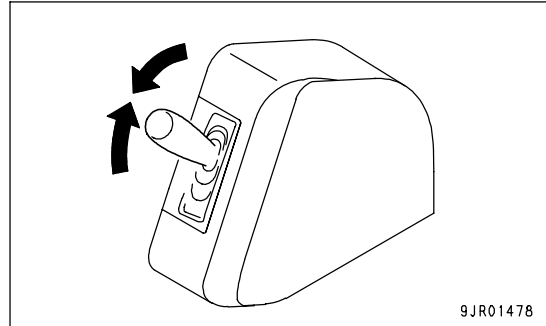
Please consult your Komatsu distributor before carrying out lifting work.

LIFTING PROCEDURE

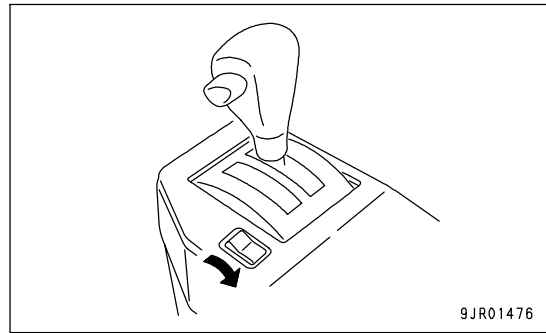
Lifting work can be carried out only with machines displaying a lifting mark.

When carrying out the lifting operation, stop the machine on firm level ground, and do as follows.

1. Start the engine, set the dump lever to the FLOAT position, and check that the body pilot lamp goes out.



2. Stop the engine, apply the brake, and check that the area around the operator's compartment is safe.



3. Select wire ropes, slings, spreader bars and other lifting equipment to match the weight of the machine, and fit the wire ropes to the lifting positions.

REMARK

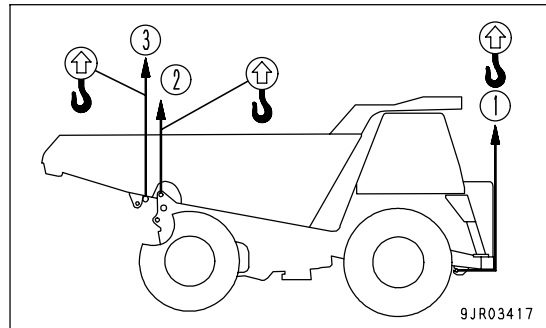
The lifting positions for the machine differs according to the conditions.

Machine with body: Positions (1) and (3)

Total: 4 places (2 at front, 2 at rear)

Machine without body: Positions (1) and (2)

Total: 4 places (2 at front, 2 at rear)



4. Fit protector blocks at the contact points between the lifting equipment and the body to prevent damage to the King equipment.

5. When the machine comes off the ground (raised 10 to 20 cm(3.9 to 7.9 in)), stop the lifting operation, check carefully that the machine is balanced and that the wire ropes are not loose, then continue the lifting operation slowly.

COLD WEATHER OPERATION

PRECAUTIONS FOR LOW TEMPERATURE

If the temperature becomes low, it becomes difficult to start the engine, and the coolant may freeze, so do as follows.

FUEL AND LUBRICANTS

Change to fuel and oil with low viscosity for all components. For details of the specified viscosity, see "RECOMMENDED FUEL, COOLANT, AND LUBRICANT (PAGE 4-9)".

COOLANT



WARNING

- Antifreeze is toxic. Be careful not to get it into your eyes or on your skin. If it should get into your eyes or on your skin, wash it off with large amounts of fresh water and see a doctor at once.
- When changing the coolant or when handling coolant containing antifreeze that has been drained when repairing the radiator, please contact your Komatsu distributor or request a specialist company to carry out the operation. Antifreeze is toxic. Do not let it flow into drainage ditches or spray it onto the ground surface.
- Antifreeze is flammable. Do not bring any flame close. Do not smoke when handling antifreeze.

NOTICE

- Use Komatsu Supercoolant wherever available, or use permanent type antifreeze coolant.
- Never use methanol, ethanol, or propanol-based antifreeze.
- Do not use any water leakage prevention agent, either alone, or in combination with antifreeze.
- Do not mix one brand of antifreeze with a different brand.

For details on the amount of antifreeze mixture and on when to change the coolant, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-25)".

BATTERY

 **WARNING**

- The battery generates flammable gas. Do not bring fire or sparks near the battery.
- Battery electrolyte is dangerous. If it gets in your eyes or on your skin, wash it off with a large amount of water and consult a doctor.
- Battery electrolyte dissolves paint. If it gets on the bodywork, wash it off immediately with water.
- If the battery electrolyte is frozen, do not charge the battery or start the engine with a different power source. There is danger that the battery may explode.
- Battery electrolyte is toxic. Do not let it flow into drainage ditches or spray it on to the ground surface.

When the ambient temperature drops, the capacity of the battery will also drop. If the battery charge ratio is low, the battery electrolyte may freeze. Maintain the battery charge as close as possible to 100%. Insulate it against cold temperature to ensure the machine can be started easily the next morning.

Measure the specific gravity and calculate the rate of charge from the following conversion table.

Charging Rate (%)	Electrolyte Temperature (°C)	20	0	-10	-20
	100		1.28	1.29	1.30
90		1.26	1.27	1.28	1.29
80		1.24	1.25	1.26	1.27
75		1.23	1.24	1.25	1.26

When adding distilled water in cold weather, add it before starting operations in the morning to prevent the electrolyte from freezing.

INSTALLATION OF RADIATOR CURTAIN

(If equipped)

If the display for the engine water temperature gauge does not enter the white range, install a radiator curtain. It is possible to adjust the degree of opening of the radiator curtain (fully closed, one side open, and both sides open). Adjust to a suitable condition to match the ambient temperature so that the engine water temperature gauge display enters the white range.

PRECAUTIONS AFTER COMPLETION OF WORK

To prevent mud, water, or the undercarriage from freezing and making it impossible for the machine to move on the following morning, observe the following precautions.

- Mud and water on the machine body should be completely removed. This is to prevent damage to the seal caused by water in mud or dirt getting inside the seal and freezing.
- Park the machine on hard, dry ground.
If this is impossible, park the machine on wooden boards.
The boards help protect the tracks from being frozen in soil and the machine can start next morning.
- Open the drain valve and drain any water collected in the fuel system to prevent it from freezing.
- As the battery capacity drops markedly in low temperatures, cover the battery or remove it from the machine, keep it in a warm place, and install it again the next morning.
- If the electrolyte level is low, add distilled water in the morning before beginning work. Do not add water after the day's work to prevent diluted electrolyte in the battery from freezing during the night.

AFTER COLD WEATHER

When the season changes and the weather becomes warmer, do as follows.

- Replace the fuel and oil for all parts with oil of the viscosity specified.
For details, see "RECOMMENDED FUEL, COOLANT, AND LUBRICANT (PAGE 4-9)".

LONG-TERM STORAGE

BEFORE STORAGE

When keeping in long-term storage (more than one month), store as follows.

- After every part is washed and dried, house the machine in a dry building. Never leave it outdoors.
In case it is indispensable to leave it outdoors, park the machine on the flat ground and cover it with canvas etc.
- Completely fill the fuel tank. This prevents moisture from collecting.
- Lubricate and change the oil before storage.
- Coat the exposed portion of the hydraulic cylinder piston rod with grease.
- Disconnect the negative terminals of the battery and cover it or remove it from the machine and store it separately.
- Apply the parking brake.
- Set the tire inflation pressure for each tire to within the range of the specified inflation pressure for the type of tire.
- Push the retarder control lever forward to the OFF position.
- Place the gear shift lever at the N position and turn the starting switch OFF.
- To prevent corrosion, be sure to fill the cooling system with Supercoolant (AF-NAC) or permanent type antifreeze (density between 30% and 68%).

DURING STORAGE



WARNING

If it is necessary to perform the rust-prevention operation while the machine is indoors, open the doors and windows to improve ventilation and prevent gas poisoning.

Operate the engine and move the machine for a short distance once a month so that a new film of oil will be coated over movable parts and component surfaces. At the same time, also charge the battery. Before operating the work equipment, wipe off all the grease from hydraulic piston rods.

AFTER STORAGE

NOTICE

If the machine has been stored without carrying out the monthly rust-prevention operation, consult your Komatsu distributor before using it.

When using the machine after long-term storage, do as follows before using it.

- Wipe off the grease from the hydraulic cylinder rods.
- Add oil and grease at all lubrication points.
- When the machine is stored for a long period, moisture in the air will mix with the oil. Check the oil before and after starting the engine. If there is water in the oil, change all the oil.

PRECAUTIONS BEFORE TRAVELING AFTER LONG-TERM STORAGE

1. Check all the oil and water levels before traveling.
2. When traveling after long-term storage, travel forward at a speed of 10 to 15 km/h (6.2 to 9.3 MPH) for 5 minutes or 1 km to run the machine in, then change to normal travel.

TROUBLESHOOTING

AFTER RUNNING OUT OF FUEL

When starting after running out of fuel, fill with fuel, then bleed the air from the fuel system before starting. For details of the method of bleeding the air, see REPLACE FUEL FILTER CARTRIDGE (PAGE 4-52).

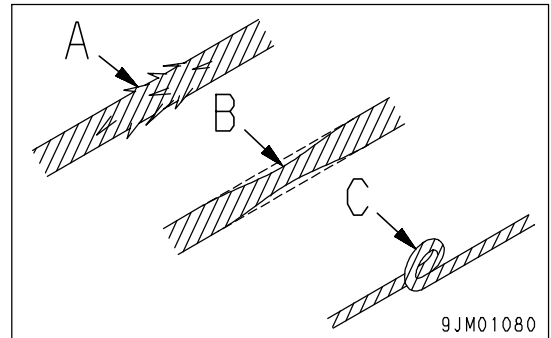
METHOD OF TOWING MACHINE



WARNING

Injury or death could result if a disabled machine is towed incorrectly or if there is a mistake in the selection of the wire rope or drawbar.

- Always confirm that the wire rope or drawbar used for towing has ample strength for the weight of the machine being towed.
- Never use a wire rope which has cut strands (A), reduced diameter (B), or kinks (C). There is danger that the rope may break during the towing operation.
- Always wear leather gloves when handling wire rope.
- Never tow a machine on a slope.
- Never go between the towing machine and the towed machine during the towing operation.
- If the machine moves suddenly, a load is applied suddenly to the towing wire or drawbar, and the towing wire or drawbar may break. Move the machine gradually to a constant speed.
- Be extremely careful if there is a failure in the engine or brake system: the brakes will not work.
- If the steering and the brakes on the disabled machine cannot be operated, do not let anyone ride on the disabled machine.



NOTICE

- The permissible towing capacity for this machine is as shown below. Do not tow any load greater than this.
HD465: 314580N (32078 kg)
HD605: 337365N (34401 kg)
- Towing is only permitted in order to move a disabled machine to a place where it is possible to carry out inspection and maintenance. It must not be towed for long distances.
- Please consult your Komatsu distributor for information about towing a disabled machine.

This machine must not be towed except in emergencies. When towing the machine, take the following precautions.

- When towing a machine, tow it at a low speed of less than 2 km/h (1.2 MPH), and for a distance of a few meters to a place where repairs can be carried out. The machine should be towed only in emergencies. If the machine must be moved long distances, use a transporter.
- Use a towing machine of the same class as the machine being towed.
Check that the towing machine has ample braking power, weight, and rimpull to allow it to control both machines on slopes or on the tow road.
- Use the specified hook for both the towing machine and the machine being towed.
- To protect the operator if the towing wire or towing bar breaks, install protective plates on both the towing machine and the machine being towed.
- There are towing hooks under the front frame and under the rear axle. Do not use any other part for the towing hook.
- When fitting the towing wire, check the condition of the hook to make sure that there is no problem.
- Keep the angle of the towing wire as small as possible.
Keep the angle between the center lines of the two machines to within 30 degrees.
- Towing may be carried out under various differing conditions, so it is impossible to determine beforehand the requirements for towing.
Towing on flat horizontal roads will require the minimum rimpull, while towing on slopes or on uneven road surfaces will require the maximum rimpull.
- If the pressure in a hydraulic circuit has dropped because of leakage of oil, the parking brake will be applied, so release the parking brake before towing.
- Before releasing the parking brake, always put blocks under all four wheels. If the wheels are not blocked, there is danger that the machine may move.
Connect with the towing wire or drawbar, and remove the blocks from the wheels when the disabled machine is in a condition where it cannot run away.
- When releasing the parking brake, check first that the surrounding area is safe.
- When the parking brake is released, the brakes cannot be used, so check carefully that the situation is safe.
- When towing down a slope, use two towing machines. One machine should be uphill from the disabled machine and should be connected with towing wire or a drawbar to pull the disabled machine back and keep it stable. The other machine should tow the disabled machine downhill.

WHEN ENGINE RUNS

- If the transmission and steering wheel can be operated, and the engine is running, it is possible to tow the machine out of mud or to move it for a short distance to the edge of the road.
- Check the effect of the brakes, and if the brakes do not work properly, take the action given in "When engine does not run".
- Check if it is possible to steer the machine. If the machine cannot be steered, follow the procedure given in "WHEN ENGINE DOES NOT RUN".
- The operator should sit on the machine being towed and operate the steering in the direction that the machine is towed.
- Always run the engine to allow the steering and brakes to be used.

WHEN ENGINE DOES NOT RUN

- The brakes will not work, so be extremely careful.
- Connect the towing machine securely to the towed machine. Use two towing machines of the same class or larger than the machine being towed: connect one machine each to the front and rear of the machine being towed.
- If it is necessary to change the direction of the machine being towed, it is possible to use the emergency steering, but it can be used for a maximum of only 90 seconds.
- If the emergency steering cannot be used, disconnect two hydraulic hoses each on the left and right from the steering cylinders, then carry out the towing operation. When removing the hoses, block the hoses with plugs and fit oil containers to the mouthpiece of the cylinder to prevent oil from draining to the ground.

WHEN PARKING BRAKE HAS BEEN ACTUATED IN EMERGENCY

If the pressure in the hydraulic circuit goes down abnormally because of oil leakage or some other cause, the parking brake is automatically applied.

It is necessary to tow or move the machine, the parking brake must be released. Release the parking brake as follows.

METHOD OF RELEASING PARKING BRAKE

Please ask your Komatsu distributor to release the parking brake.



WARNING

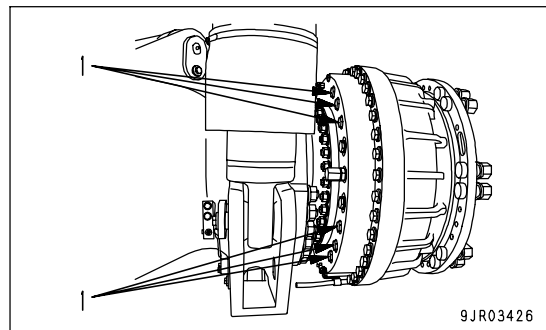
- If the parking brake is forcibly released, the rear brake will not work. When towing the machine, always travel at low speed.
- When carrying out the operation to release the parking brake, check that the surrounding area is safe, and always put blocks under all four wheels before starting the operation. If the wheels are not blocked, there is danger that the machine may suddenly move.
- Always stop the engine before starting the operation to release the parking brake.

1. When releasing the parking brake manually, prepare 20 M12 bolts (distance under head: 65 to 80 mm (2.6 to 3.2 in); thread pitch: 1.75 mm (0.069 in)(coarse thread)) and 20 M12 washers.
2. Prepare a container to catch the oil.
3. Stop the engine.
4. Put blocks under the wheels.
5. Set the container to catch the oil under the brake portion.
6. Remove plug (1) from the rear axle brake portion.

REMARK

There are 10 plugs on the right side and 10 plugs on the left side.

7. Pass the brake release bolt through the washer and insert it into the plug hole.



NOTICE

If the bolts are not tightened uniformly, the internal piston will be distorted or damaged. Tighten the bolts in turn on diagonally opposite sides.

8. Tighten the brake release bolts uniformly. (Both left and right sides)

REMARK

The piston inside the brake release the bolt is extended and the brake is released.

IF BATTERY IS DISCHARGED

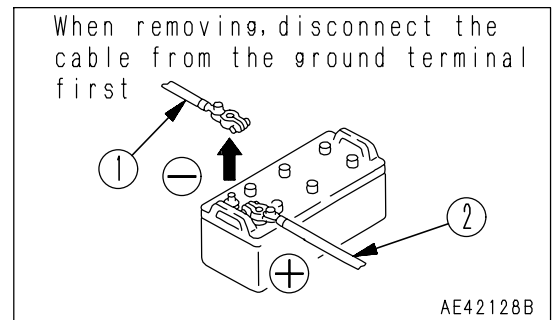


WARNING

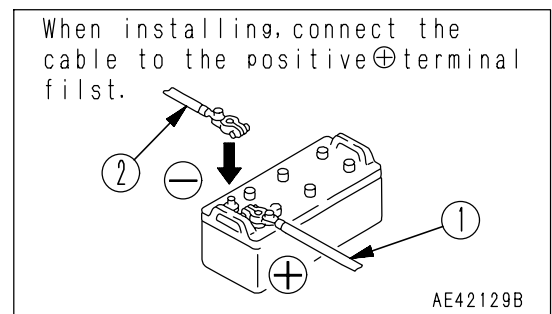
- It is dangerous to charge a battery when mounted on a machine. Make sure that it is dismantled before charging.
- When checking or handling the battery, stop the engine and turn the starting switch key to the OFF position.
- The battery generates hydrogen gas, so there is a hazard of explosion. Do not bring lighted cigarettes near the battery, or do anything that will cause sparks.
- Battery electrolyte is dilute sulfuric acid, and it will attack your clothes and skin. If it gets on your clothes or on your skin, immediately wash it off with a large amount of water. If it gets in your eyes, wash it out with fresh water and consult a doctor.
- When handling batteries, always wear safety glasses and rubber gloves.
- When removing the battery, first disconnect the cable from the ground (normally the negative (-) terminal). When installing, install the positive (+) terminal first.
If a tool touches the positive terminal and the chassis, there is danger that it will cause a spark, so be extremely careful.
- If the terminals are loose, there is danger that the defective contact may generate sparks that will cause an explosion.
- When removing or installing the terminals, check which is the positive (+) terminal and which is the negative (-) terminal.

REMOVAL AND INSTALLATION OF BATTERY

- Before removing the battery, remove the ground cable (normally connected to the negative (-) terminal).
If any tool touches between the positive terminal and the chassis, there is a hazard of sparks being generated.



- When installing the battery, connect the ground cable last.

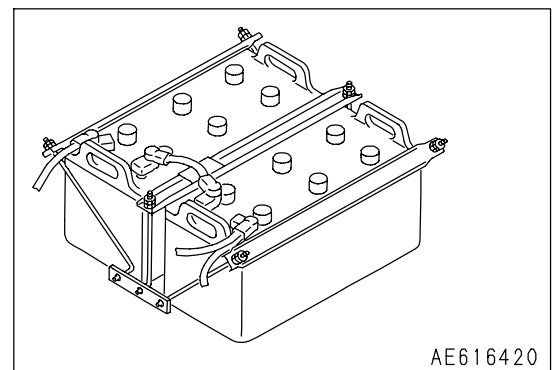


- When replacing the battery, hold the battery securely in position with the battery mounting clamps.

Tightening torque of mounting nut: 9.8 to 14 N·m
(1 to 1.5 kgf·m, 7.2 to 10.8 lbf)

NOTICE

After securing the battery, check that it does not move. If it moves, tighten it again securely.

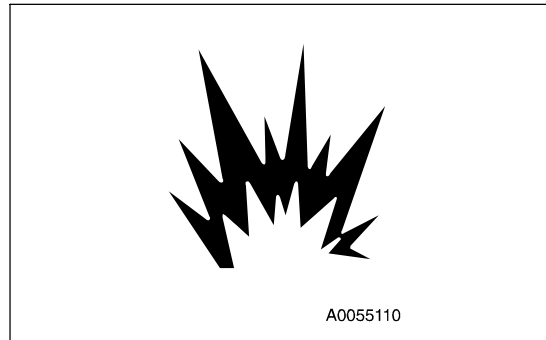


PRECAUTIONS FOR CHARGING BATTERY

CHARGING BATTERY WHEN MOUNTED ON MACHINE

When charging the battery, if the battery is not handled correctly, there is danger that the battery may explode. Always follow the instructions in "IF BATTERY IS DISCHARGED (PAGE 3-129)" and the instruction manual accompanying the charger, and do as follows.

- Set the voltage of the charger to match the voltage of the battery to be charged. If the correct voltage is not selected, the charger may overheat and cause an explosion.
- Connect the positive (+) charger clip of the charger to the positive (+) terminal of the battery, then connect the negative (-) charger clip of the charger to the negative (-) terminal of the battery. Be sure to attach the clips securely.
- Set the charging current to 1/10 of the value of the rated battery capacity; when carrying out rapid charging, set it to less than the rated battery capacity.
If the charger current is too high, the electrolyte will leak or dry up, and this may cause the battery to catch fire and explode.
- If the battery electrolyte is frozen, do not charge the battery or start the engine with a different power source. There is a danger that this will ignite the battery electrolyte and cause the battery to explode.
- Do not use or charge the battery if the battery electrolyte level is below the LOWER LEVEL line. This may cause an explosion. Check the battery electrolyte level periodically and add distilled water to bring the electrolyte level to the UPPER LEVEL line.



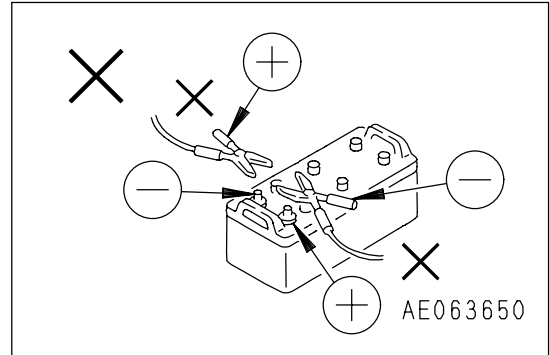
STARTING ENGINE WITH BOOSTER CABLE

When starting the engine with a booster cable, do as follows:

PRECAUTIONS WHEN CONNECTING AND DISCONNECTING BOOSTER CABLE

WARNING

- When connecting the cables, never contact the positive (+) and negative (-) terminals.
- When starting the engine with a booster cable, wear safety glasses and rubber gloves.
- Be careful not to let the normal machine and problem machine contact each other. This prevents sparks from generating near the battery which could ignite the hydrogen gas given off by the battery.
- Make sure that there is no mistake in the booster cable connections. The final connection is to the engine block of the problem machine, but sparks will be generated when this is done, so connect to a place as far as possible from the battery.
- When disconnecting the booster cable, take care not to bring the clips in contact with each other or with the machine body.



NOTICE

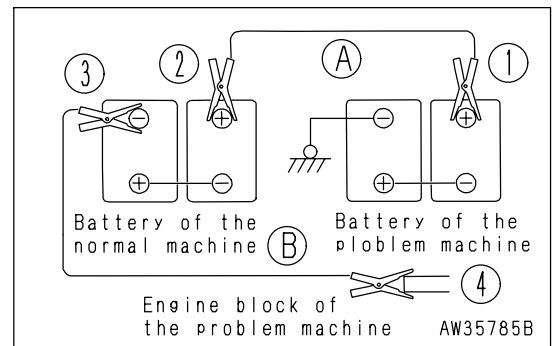
- The size of the booster cable and clip should be suitable for the battery size.
- The battery of the normal machine must be the same capacity as that of the problem machine.
- Check the cables and clips for damage or corrosion.
- Make sure that the cables and clips are firmly connected.

CONNECTING THE BOOSTER CABLES

Keep the starting switch of the normal machine and problem machine in the OFF position.

Connect the booster cable as follows, in the order of the numbers marked in the diagram.

1. Connect one clip of booster cable (A) to the positive (+) terminal of the problem machine.
2. Connect the other clip of booster cable (A) to the positive (+) terminal of the normal machine.
3. Connect one clip of booster cable (B) to the negative (-) terminal of the normal machine.
4. Connect the other clip of booster cable (B) to the engine block of the problem machine.



STARTING THE ENGINE

**CAUTION**

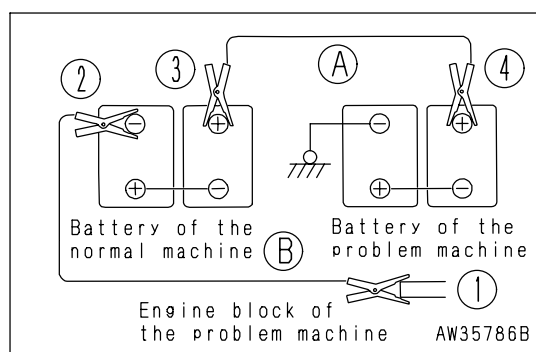
Make sure that the parking brake switch is at PARKING position and the shift lever is at N (neutral) position for both normal machine and the problem machine.

1. Make sure the clips are firmly connected to the battery terminals.
2. Start engine of the normal machine and run it at high idle speed.
3. Turn the starting switch of the problem machine to the START position and start the engine.
If the engine doesn't start at first, try again after 2 minutes or so.

DISCONNECTING THE BOOSTER CABLES

After the engine has started, disconnect booster cables in the reverse order in which they were connected.

1. Remove one clip of booster cable (B) from the engine block of the problem machine.
2. Remove the other clip of booster cable (B) from the negative (-) terminal of the normal machine.
3. Remove one clip of booster cable (A) from the positive (+) terminal of the normal machine.
4. Remove the other clip of booster cable (A) from the positive (+) terminal of the problem machine.



OTHER TROUBLE

ELECTRICAL SYSTEM

- (): Always contact your Komatsu distributor when dealing with these items.
- In cases of problems or causes which are not listed below, contact your Komatsu distributor for repairs.

Problem	Main causes	Remedy
Lamp does not glow brightly even when engine runs at high speed	<ul style="list-style-type: none"> • Defective wiring • Insufficient battery charge 	<ul style="list-style-type: none"> (• Check, repair loose terminals, disconnections) • Charge, Add distilled water • Adjust alternator belt tension. See EVERY 250 HOURS SERVICE.
Lamp flickers while engine is running	<ul style="list-style-type: none"> • Defective adjustment of belt tension 	
Battery charge system caution pilot lamp lights up while engine is running	<ul style="list-style-type: none"> • Defective alternator • Defective wiring 	<ul style="list-style-type: none"> (• Replace) (• Check, repair)
Abnormal noise is generated from alternator	<ul style="list-style-type: none"> • Defective alternator 	<ul style="list-style-type: none"> (• Replace)
Starting motor does not turn when starting switch is turned to ON	<ul style="list-style-type: none"> • Defective wiring • Defective starting switch • Insufficient battery charge • Defective battery switch • Loose ground cable terminals between engine and chassis 	<ul style="list-style-type: none"> (• Check, repair) (• Replace switch) • Charge (• Replace switch) (• Check, repair)
Starting motor turns engine sluggishly	<ul style="list-style-type: none"> • Defective wiring • Insufficient battery charge 	<ul style="list-style-type: none"> (• Check, repair) • Charge
Starting motor disengages before engine starts	<ul style="list-style-type: none"> • Defective wiring • Insufficient battery charge 	<ul style="list-style-type: none"> (• Check, repair) • Charge

CHASSIS

- (): Always contact your Komatsu distributor when dealing with these items.
- In cases of problems or causes which are not listed below, contact your Komatsu distributor for repairs.

Problem	Main causes	Remedy
Torque converter oil temperature caution lamp flashes	<ul style="list-style-type: none"> • Leakage of oil or entry of air due to damage or defective tightening of oil pipe, pipe joint • Wear, scuffing of gear pump • Insufficient oil in transmission case • Loose fan belt • Clogged oil cooler • Long distance traveled in torque converter range • Disconnected, broken wiring to sensor 	<ul style="list-style-type: none"> (• Check, repair) (• Check, repair) • Add oil to specified level. See CHECK BEFORE STARTING. • Replace belt. See EVERY 500 HOURS SERVICE. (• Clean or replace) • Drive in direct range (• Repair, connect wiring)
Steering wheel is heavy	<ul style="list-style-type: none"> • Lack of grease at link • Internal leakage inside steering cylinder 	<ul style="list-style-type: none"> • Add grease (• Replace cylinder seal)
Steering wheel pulls	<ul style="list-style-type: none"> • Tire inflation pressure not uniform on left and right • Dragging, pulling of front brake 	<ul style="list-style-type: none"> • Make tire inflation pressure uniform. See CHECK BEFORE STARTING. • Check wear of front brake pad. For details, see EVERY 500 HOURS SERVICE.
Braking effect is poor when brake pedal is depressed	<ul style="list-style-type: none"> • Pad has reached wear limit • Rear disc has reached wear limit • Insufficient oil pressure • Insufficient brake oil 	<ul style="list-style-type: none"> (• Replace pad) (• Replace disc) • Charge to specified pressure • Add oil to the transmission case. See CHECK BEFORE STARTING. • Bleed air. See WHEN REQUIRED.
Brake pulls to one side	<ul style="list-style-type: none"> • Air in brake circuit 	<ul style="list-style-type: none"> • Bleed air. See WHEN REQUIRED.
Dump body speed is slow	<ul style="list-style-type: none"> • Defective gear pump • Insufficient oil 	<ul style="list-style-type: none"> (• Replace gear pump) • Add oil to specified level. See CHECK BEFORE STARTING.
Suspension is hard	<ul style="list-style-type: none"> • Entry of soil or sand due to breakage of dust seal, gas leakage due to breakage of U-packing • Gas leaking from valve core 	<ul style="list-style-type: none"> (• Replace U-packing) (• Replace valve core)
Wheel on one side tends to slip	<ul style="list-style-type: none"> • Air in rear brake circuit (between slack adjuster and rear brake) • Excessive difference in wear between left and right tires • Excessive difference in division of load between left and right wheels (unbalanced load) • Excessive deformation of disc 	<ul style="list-style-type: none"> • Bleed air from rear brakes (left, right). See WHEN REQUIRED. (• Replace tires) • Make load uniform (• Disassemble and adjust brake)

IF ACCELERATOR PEDAL HAS FAILED

In addition to the potentiometer detecting the pedal depression depth, the switch (check switch) is installed on the accelerator pedal assembly in order to detect whether the accelerator pedal is depressed or not.

If the pedal depression depth is not detected correctly due to a failure of the accelerator pedal or incorrect electric wiring, the engine controller controls the engine speed responding to the signal from this check switch. The engine runs at 1500 rpm when the accelerator pedal is depressed, while the engine runs at low idle when the pedal is released. The engine speed varies depending on the load.

After using the accelerator pedal to move the machine to a safe place, check the service code and contact your Komatsu distributor.

There are two methods when operating the accelerator pedal: either release the pedal (check switch is OFF, low idle), or depress the pedal fully (1500 rpm).

If the accelerator pedal is held at an intermediate position, the system may not be able to judge if the accelerator pedal is being operated or not.

REMARK

If the engine controller cannot perform normal reception of the signal of the accelerator pedal depth, the central warning lamp flashes and simultaneously the alarm buzzer sounds and user code 02 appears.

ENGINE

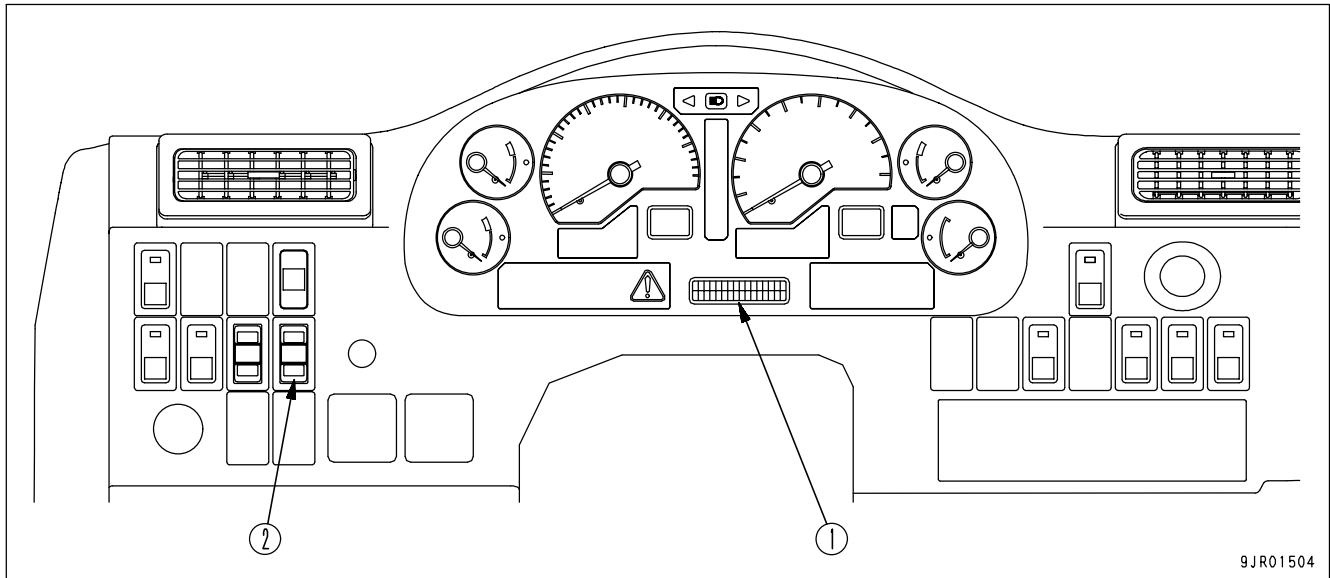
- (): Always contact your Komatsu distributor when dealing with these items.
- In cases of problems or causes which are not listed below, contact your Komatsu distributor for repairs.

Problem	Main causes	Remedy
Engine oil pressure caution lamp lights up	<ul style="list-style-type: none"> • Insufficient oil in oil pan • Clogged oil filter cartridge • Oil leakage due to damage caused by defective tightening of oil pan, pipe joint • Disconnection, broken wiring to sensor 	<ul style="list-style-type: none"> • Add oil to specified level. See CHECK BEFORE STARTING. • Replace cartridge, see EVERY 500 HOURS SERVICE. (• Check, repair) (• Repair, connect wiring)
Steam spurts out from top of radiator (pressure valve)	<ul style="list-style-type: none"> • Insufficient coolant, coolant leakage • Loose fan belt 	<ul style="list-style-type: none"> • Check, add coolant. See CHECK BEFORE STARTING. • Replace belt. See EVERY 500 HOURS SERVICE.
Drop in engine water level is displayed on the character display and the maintenance caution lamp lights up.	<ul style="list-style-type: none"> • Dirt or scale accumulated in cooling system 	<ul style="list-style-type: none"> • Change coolant, clean inside of cooling system. See WHEN REQUIRED.
Water temperature gauge is in red range	<ul style="list-style-type: none"> • Radiator fins clogged or damaged • Defective water temperature gauge • Defective thermostat 	<ul style="list-style-type: none"> • Clean or repair. See WHEN REQUIRED. (• Replace water temperature gauge) (• Replace thermostat)
Engine water temperature caution lamp flashes	<ul style="list-style-type: none"> • Defective thermostat seal • Loose radiator filler cap • Disconnection, broken wiring to sensor 	<ul style="list-style-type: none"> (• Replace thermostat seal) • Tighten or replace cap. (• Repair, connect wiring)
Water temperature gauge display stays at lowest level and does not rise	<ul style="list-style-type: none"> • Defective water temperature gauge • Defective thermostat • In cold weather, cold wind is blowing strongly against engine 	<ul style="list-style-type: none"> (• Replace water temperature gauge) (• Replace thermostat) (• Install radiator curtain)
Engine does not start even when starting motor is turned	<ul style="list-style-type: none"> • Insufficient fuel • Air in fuel system • No fuel in fuel filter • Starting motor cranks engine too slowly • Starting motor does not turn • Defective valve clearance (defective compression) 	<ul style="list-style-type: none"> • Add fuel. See CHECK BEFORE STARTING. (• Repair place where air is leaking in) • Fill filter with fuel. See EVERY 500 HOURS SERVICE. • See electrical components • See electrical components (• Adjust valve clearance)
Fuel stops from time to time	<ul style="list-style-type: none"> • Crushed fuel tank breather tube 	<ul style="list-style-type: none"> (• Replace breather tube)

Problem	Main causes	Remedy
Excessive oil consumption	<ul style="list-style-type: none"> • Oil leakage • Excessive oil in oil pan 	<ul style="list-style-type: none"> (• Check, repair) • Add oil to specified level. See CHECK BEFORE STARTING.
Exhaust gas is white or bluish	<ul style="list-style-type: none"> • Worn piston, ring, cylinder liner • Improper fuel • Defective turbocharger 	<ul style="list-style-type: none"> (• Replace) • Replace with specified fuel (• Check, replace)
Exhaust gas is black	<ul style="list-style-type: none"> • Clogged air cleaner element • Worn piston, ring, cylinder liner • Defective compression • Defective turbocharger 	<ul style="list-style-type: none"> • Clean or replace. See WHEN REQUIRED. (• Check, repair) • See adjustment of valve clearance above (• Check, replace)
Engine hunts	<ul style="list-style-type: none"> • Air entering suction side of fuel line 	<ul style="list-style-type: none"> (• Repair place where air is leaking in)
Combustion noise occasionally makes breathing sound	<ul style="list-style-type: none"> • Defective nozzle 	<ul style="list-style-type: none"> (• Replace nozzle)
There is knocking (combustion or mechanical)	<ul style="list-style-type: none"> • Poor quality fuel being used • Overheating 	<ul style="list-style-type: none"> • Replace with specified fuel • See "Water temperature gauge is in red range" above.

ACTION CODE

If any problem occurs, stop the machine, apply the parking brake and check the service code, then contact your Komatsu distributor for repairs.



If action code "E03" is displayed on the character display (1), or if an action code is displayed after taking the remedy when action code "E02" was displayed, or if "MAINTENANCE" is displayed together with action code "E01", do as follows to check the failure code.

1. If an action code is displayed, pressed the top (>) portion of machine monitor mode selector switch (2) and check the failure code. The failure code is displayed on character display (1).
2. Press the top (>) portion of machine monitor mode selector switch (2) again. The service meter and odometer will be displayed for several seconds, and the screen will then return to the action code screen. If more than one failure has occurred, the next failure code is displayed.
3. Check the failure code, then contact your Komatsu distributor for repairs.

REMARK

- The 6-digit code displayed on the left of the line at the top of the character display is the failure code.
- The code displayed at the right side of the failure code shows the controller that detected the failure code.
MON: Machine monitor
TM: Transmission controller
ENG: Engine controller
BK: Retarder controller
- The line at the bottom of the character display shows the system where the failure was generated.

MAINTENANCE

WARNING

Please read and make sure that you understand the SAFETY section before reading this section.

GUIDES TO MAINTENANCE

Do not perform any inspection and maintenance operation that is not found in this manual.

CHECK SERVICE METER:

Check the service meter reading every day to see if the time has come for any necessary maintenance to be performed.

KOMATSU GENUINE REPLACEMENT PARTS:

Use Komatsu genuine parts specified in the Parts Book as replacement parts.

KOMATSU GENUINE OILS:

Use Komatsu genuine oils and grease. Choose oils and grease with proper viscosities specified for ambient temperature.

ALWAYS USE CLEAN WASHER FLUID:

Use automobile window washer fluid, and be careful not to let any dirt get into it.

ALWAYS USE CLEAN OIL AND GREASE:

Use clean oil and grease. Also, keep the containers of the oil and grease clean. Keep foreign materials away from oil and grease.

CHECKING FOREIGN MATERIALS IN DRAINED OIL AND ON FILTERS:

After oil is changed or filters are replaced, check the old oil and filters for metal particles and foreign materials. If large quantity of metal particles or foreign materials are found, always report to the person in charge, and carry out suitable action.

OIL CHANGE:

If your machine is equipped with a fuel strainer, do not remove it while fueling.

WELDING INSTRUCTIONS:

- Turn off the engine starting switch.
- Do not apply more than 200 V continuously.
- Connect grounding cable within 1 m (3.3 ft) of the area to be welded. If grounding cable is connected near instruments, connectors, etc., the instruments may malfunction.
- If a seal or bearing happens to come between the part being welded and grounding point, change the grounding point to avoid such parts.
- Do not use the area around the pins or the hydraulic cylinders as the grounding point.
Sparks will cause damage to the plated portion.

DO NOT DROP THINGS INSIDE MACHINE:

- When opening inspection windows or the oil filler port of the tank to carry out inspection, be careful not to drop nuts, bolts, or tools inside the machine.
If such things are dropped inside the machine, it may cause damage and/or malfunction of the machine, and will lead to failure. If you drop anything inside the machine, always remove it immediately.
- Do not put unnecessary things in your pockets. Carry only things which are necessary for inspection.

DUSTY WORKSITES:

When working at dusty worksites, do as follows:

- Inspect the dust indicator frequently to see if the air cleaner is clogged.
Clean the air cleaner element at a shorter interval than specified.

- Clean the radiator core frequently to avoid clogging.
- Clean and replace the fuel filter frequently.
- Clean electrical components, especially the starting motor and alternator, to avoid accumulation of dust.
- When inspecting or changing the oil, move the machine to a place that is free of dust to prevent dirt from getting into the oil.

AVOID MIXING OILS:

If a different brand or grade of oil has to be added, drain the old oil and replace all the oil with the new brand or grade of oil. Never mix different brand or grade of oil.

LOCKING INSPECTION COVERS:

Lock inspection cover securely into position with the lock bar. If inspection or maintenance is performed with inspection cover not locked in position, there is a danger that it may be suddenly blow shut by the wind and cause injury to the worker.

PRECAUTION WHEN REMOVING HYDRAULIC HOSE:

The hydraulic system is always under the internal pressure. When inspecting or replacing piping or hoses, always check that the pressure in the hydraulic circuit has been released. If inspection or maintenance is carried out while the circuit is still under pressure, it will lead to serious injury. For details of the method of releasing the pressure, see each inspection and maintenance item.

In particular, with the brake circuit, depress the brake pedal at least 20 times to reduce the accumulator pressure to 0 before the operation.

BLEEDING AIR FROM HYDRAULIC CIRCUIT:

If the hydraulic components have been repaired or replaced and if the hydraulic hoses, pipes, etc. have been disconnected, it is necessary to bleed air in the circuit. See "WHEN REQUIRED (PAGE 4-19)".

PRECAUTIONS WHEN INSTALLING HYDRAULIC HOSES:

- When removing parts at locations where there are O-rings or gasket seals, clean the mounting surface, and replace with new parts.
When doing this, be careful not to forget to assemble the O-rings and gaskets.
- When installing the hoses, do not twist them or bend them sharply. If they are installed so, their service life will be shortened extremely and they may be damaged.

CHECKS AFTER INSPECTION AND MAINTENANCE:

If you forget to perform the checks after inspection and maintenance, unexpected problems may occur, and this may lead to serious injury or property damage. Always do the following:

- Checks after operation (with engine stopped)
 - Have any inspection and maintenance points been forgotten?
 - Have all inspection and maintenance items been performed correctly?
 - Have any tools or parts been dropped inside the machine? It is particularly dangerous if parts are dropped inside the machine and get caught in the lever linkage mechanism.
 - Are there any leakage of coolant or oil? Have all nuts and bolts been tightened?
- Check when the engine is running
 - See "TWO WORKERS FOR MAINTENANCE WHEN ENGINE IS RUNNING (PAGE 2-29)" in the section on safety for checking when the engine is running. Pay enough attention for safety.
 - Check if the inspected and serviced area is normally operated.
 - Increase the engine speed to check for the leak of fuel and oil.

OUTLINE OF SERVICE

- Always use Komatsu genuine parts for replacement parts, grease or oil.
- When changing the oil or adding oil, do not mix different types of oil. When changing the type of oil, drain all the old oil and fill completely with the new oil. Always replace the filter at the same time. (There is no problem if the small amount of oil remaining in the piping mixes with the new oil.)
- Unless otherwise specified, when the machine is shipped from the factory, it is filled with the oil and coolant listed in the table below.

Item	Type
Engine oil pan	Engine oil EO15W40DH (Komatsu genuine parts)
Transmission case	Power train oil TO30 (Komatsu genuine parts)
Steering, hoist oil tank Front suspension Rear suspension	Power train oil TO10 (Komatsu genuine parts)
Differential case Final drive case	Power train oil TO30 (Komatsu genuine parts)
Radiator	Supercoolant AF-NAC (Density:30% or above)(Komatsu genuine parts)

HANDLING OIL, FUEL, COOLANT, AND PERFORMING OIL CLINIC

OIL

- Oil is used in the engine and hydraulic equipment under extremely severe conditions (high temperature, high pressure), and deteriorates with use.
Always use oil that matches the grade and maximum and minimum ambient temperatures recommended in the Operation and Maintenance Manual. Even if the oil is not dirty, always change the oil at the specified interval.
- Oil corresponds to blood in the human body, always be careful when handling it to prevent any impurities (water, metal particles, dirt, etc.) from getting in.
The majority of problems with the machine are caused by the entry of such impurities.
Take particular care not to let any impurities get in when storing or adding oil.
- Never mix oils of different grades or brands.
- Always add the specified amount of oil.
Having too much oil or too little oil are both causes of problems.
- If the oil in the work equipment is not clear, there is probably water or air getting into the circuit. In such cases, please contact your Komatsu distributor.
- When changing the oil, always replace the related filters at the same time.
- We recommend you have an analysis made of the oil periodically to check the condition of the machine. For those who wish to use this service, please contact your Komatsu distributor.
- When using commercially available oil, it may be necessary to reduce the oil change interval.
We recommend that you use the Komatsu oil clinic to carry out a detailed checks of the characteristics of the oil.

FUEL

- To prevent the moisture in the air from condensing and forming water inside the fuel tank, always fill the fuel tank after completing the day's work.
- The fuel pump is a precision instrument, and if fuel containing water or dirt is used, it cannot work properly.
- Be extremely careful not to let impurities get in when storing or adding fuel.
- Always use the fuel specified in the Operation and Maintenance Manual.
Fuel may congeal depending on the temperature when it is used (particularly in low temperatures below -15°C (5°F)), so it is necessary to use the fuel that is suitable for the temperature.
- Before starting the engine, or when 10 minutes have passed after adding fuel, drain the sediment and water from the fuel tank.
- If the engine runs out of fuel, or if the filters have been replaced, it is necessary to bleed the air from the circuit.
- If there is any foreign material in the fuel tank, wash the tank and fuel system.

COOLANT AND WATER FOR DILUTION

- The coolant has the important function of preventing corrosion as well as preventing freezing.
Even in the areas where freezing is not an issue, the use of antifreeze coolant is essential.
Komatsu machines are supplied with Komatsu Supercoolant (AF-NAC). Komatsu Supercoolant (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for 2 years or 4000 hours. Komatsu Supercoolant (AF-NAC) is strongly recommended wherever available.
- When diluting the antifreeze coolant, use distilled water or tap water (soft water).
Natural water, such as a river water or well water (hard water), contains large amounts of minerals (calcium, magnesium, etc.), and this makes it easier for scale to form inside the engine or radiator. Once scale is deposited inside the engine or radiator, it is extremely difficult to remove. It also causes overheating due to poor heat exchange, so when you dilute the coolant, we recommend that you use water with an overall hardness of less than 100 PPM.
- When using antifreeze, always observe the precautions given in the Operation and Maintenance Manual.
- Antifreeze coolant is flammable, so be sure to keep it away from flame.
- The ratio of Supercoolant (AF-NAC) to water differs according to the ambient temperature.
For details of the ratio when mixing, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-25)".
Supercoolant (AF-NAC) may be supplied already mixed. In such cases, never dilute with water.
- If the engine overheats, wait for the engine to cool before adding coolant.
- If the coolant level is low, it will cause overheating, and will also cause problems with corrosion due to air entering the coolant.

GREASE

- Grease is used to prevent seizure and noises at the joints.
- This construction equipment is used under heavy-duty conditions. Always use the recommended grease and follow the change intervals and recommended ambient temperatures given in this Operation and Maintenance Manual.
- The nipples not included in the maintenance section are nipples for overhaul, so they do not need grease.
If any part becomes stiff after being used for long time, add grease.
- Always wipe off all of the old grease that is pushed out when greasing.
Be particularly careful to wipe off the old grease in places where sand or dirt sticking in the grease would cause wear of the rotating parts.

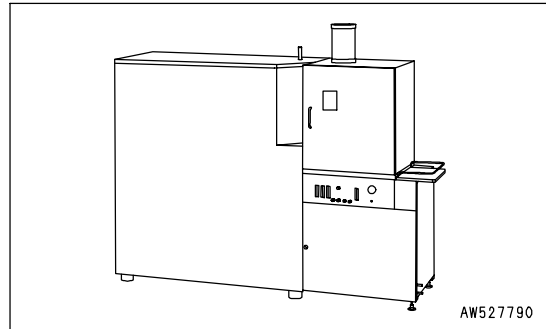
CARRYING OUT KOWA (Komatsu Oil Wear Analysis)

KOWA is a maintenance service that makes it possible to prevent machine failures and downtime. With KOWA, the oil is periodically sampled and analyzed. This enables early detection of wear of the machine drive parts and other problems.

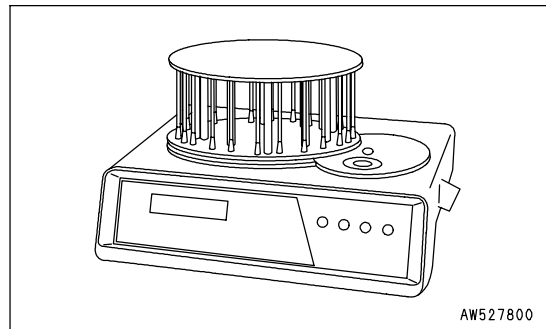
We strongly recommend you to use this service. The oil analysis is carried out at actual cost, so the cost is low, and the results of the analysis are reported together with recommendations which will reduce repair costs and machine downtime.

KOWA ANALYSIS ITEMS

- Measurement of density of metal wear particles
This uses an ICP (Inductively Coupled Plasma) analyzer to measure the density of iron, copper, and other metal wear particles in the oil.



- Measurement of quantity of particles
This uses a particle quantifier index measurement machine to measure the quantity of iron particles of 5µ or more, enabling early detection of failures.



- Others
Measurements are made of items such as the ratio of water in the oil, density of the antifreeze coolant, ratio of fuel in the oil, and dynamic viscosity, enabling a highly precise diagnosis of the machine's health.

OIL SAMPLING

- Sampling interval
250 hours: Engine
500 hours: Other components
- Precautions when sampling
 - Make sure that the oil is well mixed before sampling.
 - Perform sampling at regular fixed intervals.
 - Do not perform sampling on rainy or windy days when water or dust can get into the oil.

For further details of KOWA, please contact your Komatsu distributor.

STORING OIL AND FUEL

- Keep indoors to prevent any water, dirt, or other impurities from getting in.
- When keeping drum cans for a long period, put the drum on its side so that the filler port of the drums is at the side to prevent moisture from being sucked in.
If drums have to be stored outside, cover them with a waterproof sheet or take other measures to protect them.
- To prevent any change in quality during long-term storage, be sure to use in the order of first in - first out (use the oldest oil or fuel first).

FILTERS

- Filters are extremely important safety parts. They prevent impurities in the fuel and air circuits from entering important equipment and causing problems.
Replace all filters periodically. For details, see the Operation and Maintenance Manual.
However, when working in severe conditions, replace the filters at shorter intervals according to the oil and fuel (sulfur content) being used.
- Never try to clean the filters (cartridge type) and use them again. Always replace with new filters.
- When replacing oil filters, check if any metal particles are attached to the old filter. If any metal particles are found, contact your Komatsu distributor.
- When replacing the engine oil filter, fill the new filter with the specified clean oil, then install it.
- Do not open packs of spare filters until just before they are to be used.
- Use of Komatsu genuine filter elements is strongly recommended.

OUTLINE OF ELECTRIC SYSTEM

- It is extremely dangerous if the electrical equipment becomes wet or the covering of the wiring is damaged. This will cause an electrical short circuit and may lead to malfunction of the machine. Do not wash the inside of the operator's cab with water. When washing the machine, be careful not to let water get into the electrical components.
- Service relating to the electric system is checking fan belt tension, checking damage or wear to the fan belt and checking battery fluid level.
- Never install any electric components other than those specified by Komatsu.
- External electro-magnetic interference may cause malfunction of the control system controller, before installing a radio receiver or other wireless equipment, contact your Komatsu distributor.
- When working at the seashore, carefully clean the electric system to prevent corrosion.
- When installing an operator's cab cooler or any other electrical equipment, connect it to an independent power source connector. The cables to supply power to the optional equipment must never be connected to the fuse, starting switch, or battery relay.

WEAR PARTS

Wear parts such as the filter element, air cleaner element, etc. are to be replaced at the time of periodic maintenance or before their abrasion limits.

The wear parts should be changed correctly in order to use the machine economically.

For part change, Komatsu genuine parts of excellent quality should be used.

When ordering parts, please check the part number in the parts book.

WEAR PARTS LIST

The parts in parentheses are to be replaced at the same time.

Item	Part No.	Part Name	Q'ty	Replacement frequency
Engine oil filter	600-211-1231	Cartridge	2	EVERY 500 HOURS
Fuel filter (standard specification)	600-319-3111	Cartridge	2	
Fuel filter (fuel filter with water separator specification)	600-311-3240	Cartridge	2	
Fuel filter (additional fuel filter with water separator specification)			4	
Transmission oil filter	569-16-81160 (07000-02125)	Element (O-ring)	2 (2)	
Corrosion resistor	600-411-1171	Cartridge	1	EVERY 1000 HOURS
Brake oil filter	569-43-83920 (07000-12065) (07001-02065)	Element (O-ring) (Back-up ring)	1 (1) (1)	
Transmission, rear brake cooling oil filter	07063-51210 (07000-F5180)	Element (O-ring)	1 (1)	
Steering, hoist oil filter	07063-51210 (07000-F5180)	Element (O-ring)	1 (1)	EVERY 2000 HOURS
Air cleaner	600-185-6100	Element Ass'y	2	-
	600-185-6110	Outer element	2	
Payload meter (if equipped) inner battery	581-86-55710	Battery	1	

RECOMMENDED FUEL, COOLANT, AND LUBRICANT

- Komatsu genuine oils are adjusted to maintain the reliability and durability of Komatsu construction equipment and components.

In order to keep your machine in the best conditioner for long periods of time, it is essential to follow the instructions in this Operation and Maintenance Manual.

- Failure to follow these recommendations may result in shortened life or excess wear of the engine, power train, cooling system, and/or other components.
- Commercially available lubricant additives may be good for the machine, but they may also cause harm. Komatsu does not recommend any commercially available lubricant additive.
- Use the oil recommended according to the ambient temperature in the chart below.
- Specified capacity means the total amount of oil including the oil in the tank and the piping. Refill capacity means the amount of oil needed to refill the system during inspection and maintenance.
- When starting the engine in temperatures below 0°C (32°F), be sure to use the recommended multi-grade oil, even if the ambient temperature may become higher during the course of the day.
- If the machine is operated at a temperature below -20°C (-4°F), a separate device is needed, so consult your Komatsu distributor.
- When the fuel sulfur content is less than 0.5%, change the engine oil according to the period inspection table given in this Operation and Maintenance Manual.

If the fuel sulfur content is more than 0.5%, change the oil according to the following table.

Fuel sulfur content	Engine oil change interval
0.5 to 1.0%	1/2 of regular interval
Above 1.0%	1/4 of regular interval

USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE

Reservoir	Fluid Type	Ambient Temperature, degrees Celsius									Recommended Komatsu Fluids
		-22	-4	14	32	50	68	86	104	122 °F	
		-30	-20	-10	0	10	20	30	40	50 °C	
Engine oil pan	Engine oil	SAE0W30EOS and HTHS 3.5min. (Note.1)									Komatsu EOS0W30
		SAE5W40EOS and HTHS 3.5min. (Note.1)									Komatsu EOS5W40
		SAE10W30									Komatsu EO10W30DH API CH-4 API CI-4
		SAE15W40									Komatsu EO15W40DH API CH-4 API CI-4
		SAE30DH									Komatsu EO30DH
Transmission Case	Power train oil (Note.2)	TO10									TO10
		TO30									TO30
Steering, hoist oil tank	Power train oil	TO10									TO10
Front suspension Rear suspension	Hydraulic oil (Note.3)	HO-MVK									HO-MVK
Differential case Final drive case	Power train oil	TO30									TO30
		TO50									TO50
Grease fitting	Hyper grease (Note.4)	G2-T, G2-TE									G2-T, G2-TE
	Lithium EP grease	G2-LI									G2-LI
Cooling system	Supercoolant AF-NAC	AF-NAC (Note.5)									AF-NAC
Fuel tank	Diesel fuel	No.2-D									ASTM No.2-D
		No.1-D									ASTM No.1-D

- SAE: Society of Automotive Engineers
- ASTM: American Society of Testing and Material
- API: American Petroleum Institute

Reservoir		Engine oil pan	Transmission case	Steering, hoist oil tank	Front suspension (each)	Rear suspension (each)	Differential case
Capacity	Liters	67	285	180	17	11.3	95
	US gal	17.7	75.3	47.6	4.5	3.0	25.1
Specified	Liters	57	190	122	-	-	95
	US gal	15.6	50.2	32.2	-	-	25.1

Reservoir		Final drive case (each)	Fuel tank	Cooling system
Capacity	Liters	32	780	154
	US gal	8.5	206.1	40.7
Specified	Liters	21	-	-
	US gal	5.6	-	-

Note 1: SAE0W30EOS and SAE5W40EOS must be fully synthetic and HTHS (High-Temperature High-Shear Viscosity 150°C) must be equal to or higher than 3.5 cP. Komatsu EOS0W30 and EOS5W40 are the most suitable oils. If these oils are not available, follow the instruction "RECOMMENDED BRANDS, RECOMMENDED QUALITY FOR PRODUCTS OTHER THAN KOMATSU GENUINE OIL (PAGE 4-12)" at the end of this chapter.

Note 2: Powertrain oil has different properties from engine oil. Be sure to use the recommended oils.

Note 3: Oil for suspension

If engine oil is used for the suspension, there is danger that the additives included in the oil will cause premature deterioration of the seal, so always use the specified oil.

Note 4: Hyper grease (G2-T, G2-TE) has a high performance.

When it is necessary to improve the lubricating ability of the grease in order to prevent squeaking of pins and bushings, the use of G2-T or G2-TE is recommended.

Note 5: Supercoolant (AF-NAC)

1) The coolant has the important function of preventing corrosion as well as preventing freezing.

Even in the areas where freezing is not an issue, the use of antifreeze coolant is essential.

Komatsu machines are supplied with Komatsu Supercoolant (AF-NAC). Komatsu Supercoolant (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for 2 years or 4000 hours.

Komatsu Supercoolant (AF-NAC) is strongly recommended wherever available.

2) For details of the ratio when diluting super coolant with water, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-25)".

When the machine is shipped from the factory, it may be filled with coolant containing 30% or more Supercoolant (AF-NAC). In this case, no adjustment is needed for temperatures down to -10°C (14°F). (never dilute with water)

3) To maintain the anticorrosion properties of Supercoolant (AF-NAC), always keep the density of Supercoolant between 30% and 68%.

RECOMMENDED BRANDS, RECOMMENDED QUALITY FOR PRODUCTS OTHER THAN KOMATSU GENUINE OIL

When using commercially available oils other than Komatsu genuine oil, or when checking the latest specifications, refer to the Komatsu web page or consult your Komatsu distributor.

STANDARD TIGHTENING TORQUES FOR BOLTS AND NUTS

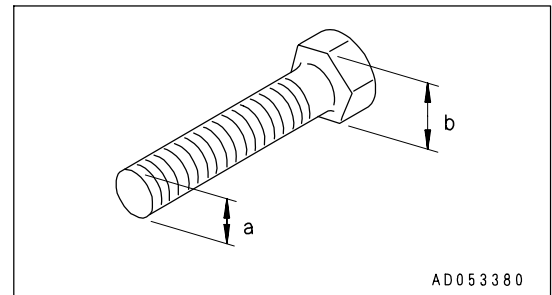
TORQUE LIST

Unless otherwise specified, tighten the metric nuts and bolts to the torque shown in the table below.

The tightening torque is determined by the width across the flats (b) of the nut and bolt.

If it is necessary to replace any nut or bolt, always use a Komatsu genuine part of the same size as the part that was replaced.

Thread diameter of bolt (a)(mm)	Width across flats (b)(mm)	Tightening torque					
		Target value			Service limit		
		N·m	kgf·m	lbft	N·m	kgf·m	lbft
6	10	13.2	1.35	9.8	11.8-14.7	1.2-1.5	8.7-10.8
8	13	31	3.2	23.1	27-34	2.8-3.5	20.3-25.3
10	17	66	6.7	48.5	59-74	6.0-7.5	43.4-54.2
12	19	113	11.5	83.2	98-123	10.0-12.5	72.3-90.4
14	22	177	18	130.2	157-196	16.0-20.0	115.7-144.7
16	24	279	28.5	206.1	245-309	25.0-31.5	180.8-227.8
18	27	382	39	282.1	343-425	35.0-43.5	253.2-314.6
20	30	549	56	405.0	490-608	50.0-62.0	361.7-448.4
22	32	745	76	549.7	662-829	67.5-84.5	488.2-611.2
24	36	927	94.5	683.5	824-1030	84.0-105.0	607.6-759.5
27	41	1320	135.0	976.5	1180-1470	120.0-150.0	868.0-1085.0
30	46	1720	175.0	1265.8	1520-1910	155.0-195.0	1121.1-1410.4
33	50	2210	225.0	1627.4	1960-2450	200.0-250.0	1446.6-1808.3
36	55	2750	280.0	2025.2	2450-3040	250.0-310.0	1808.3-2242.2
39	60	3280	335.0	2423.1	2890-3630	295.0-370.0	2133.7-2676.2



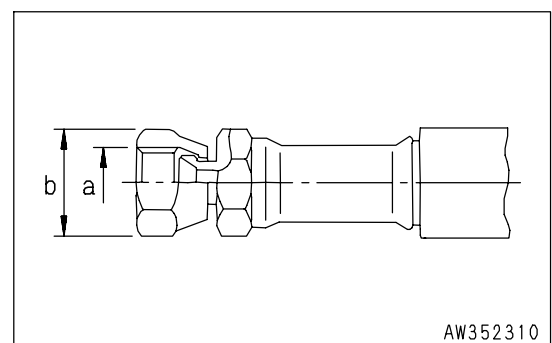
NOTICE

When tightening panels or other parts having tightening fixtures made of plastic, be careful not to use excessive torque: doing so will damage the plastic parts. Pay enough attention when you tighten up.

Apply the following table for Hydraulic Hose.

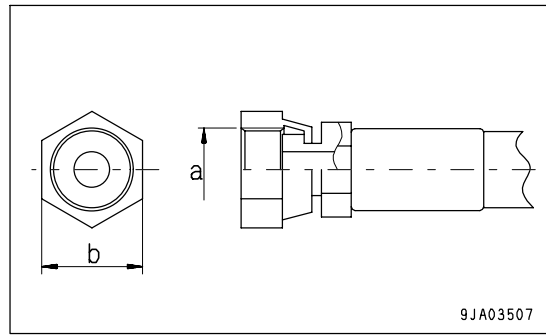
- Taper seal

Thread diameter of bolt (a)(mm)	Width across flats (b)(mm)	Tightening torque					
		Target value			Service limit		
		N·m	kgf·m	lbft	N·m	kgf·m	lbft
10	14	14.7	1.5	10.8	12.7-16.7	1.3-1.7	9.4-12.3
14	19	29.4	3.0	21.7	27.5-39.2	2.8-4.0	20.3-28.9
18	24	78.5	8.0	57.3	58.8-98.1	6.0-10.0	43.4-72.3
22	27	117.7	12.0	86.8	88.3-137.3	9.0-14.0	65.1-101.3
24	32	147.1	15.0	108.5	117.7-176.5	12.0-18.0	86.8-130.2
30	36	215.7	22.0	159.1	176.5-245.2	18.0-25.0	130.2-180.8
33	41	255.0	26.0	188.1	215.7-284.4	22.0-29.0	159.1-209.8



• Face seal

Nominal - No. of threads (a)	Width across flats (b) (mm)	Tightening torque					
		Target value			Permissible range		
		N·m	kgf·m	lbft	N·m	kgf·m	lbft
9/16 -18UNF	19	44	4.5	32.5	35 - 63	3.5 - 6.5	25.3 - 47.0
11/16 -16UN	22	74	7.5	54.2	54 - 93	5.5 - 9.5	39.8 - 68.7
13/16 -16UN	27	103	10.5	75.9	84 - 132	8.5 - 13.5	61.5 - 97.6
1 -14UNS	32	157	16.0	115.7	128 - 186	13.0 - 19.0	94.0 - 137.4
13/16 -12UN	36	216	22.0	159.1	177 - 245	18.0 - 25.0	130.2 - 180.8



PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS

To ensure safety at all times when operating or driving the machine, the user of the machine must always carry out periodic maintenance. In addition, to further improve safety, the parts in the safety-critical parts list on the next page must also be replaced at the specified interval. These parts are particularly closely connected to safety and fire prevention, so please contact your Komatsu distributor to have them replaced.

Material quality of these parts can change as time passes and they are likely to wear out or deteriorate. However, it is difficult to determine the extent of wear or deterioration at the time of periodic maintenance. Hence, it is required to replace them with new ones regardless of their condition after a certain period of usage. This is important to ensure that these parts maintain their full performance at all times.

Furthermore, should anything abnormal be found on any of these parts, replace it with a new one even if the periodic replacement time for the part has not yet arrived.

If any of the hose clamps show deterioration like deformation or cracking, replace the clamps at the same time as the hoses.

Also perform the following checks with hydraulic hoses which need to be replaced periodically. Tighten all loose clamps and replace defective hoses, as required.

When replacing hoses, always replace O-rings, gaskets, and other such parts at the same time.

SAFETY CRITICAL PARTS

No.	Safety critical parts for periodic replacement	Replacement interval	Remarks
1	Fuel hose (strainer - fuel filter)	Every 4000 hours or 2 years, whichever comes sooner	
2	Fuel hose (fuel filter - fuel pump)		
3	Fuel hose (engine - fuel cooler)		
4	Fuel hose (fuel cooler - fuel tank)		
5	Rubber hose for brake piping		
6	High-pressure hose in steering oil pressure circuit (pump ↔ demand valve ↔ steering valve ↔ steering cylinder)		Replace as Ass'y
7	High-pressure hose in hoist circuit (pump ↔ demand valve ↔ hoist valve ↔ hoist cylinder)		
8	Hose at discharge side of retarder cooling pump		
9	Hose at discharge side of transmission pump		
10	Seat belt		

MAINTENANCE SCHEDULE CHART

MAINTENANCE SCHEDULE CHART

INITIAL 250 HOURS SERVICE (ONLY AFTER THE FIRST 250 HOURS)

Change oil in engine oil pan, replace engine oil filter cartridge	4- 51
Replace transmission oil filter element	4- 55
Change oil in transmission case	4- 59
Replace transmission and rear brake cooling oil filter element	4- 61
Replace steering, hoist oil tank filter element	4- 65
Clean hydraulic tank strainer	4- 66
Change oil in final drive case	4- 67
Change oil in differential case	4- 67
Change oil in steering, hoist oil tank	4- 70

INITIAL 2000 HOURS SERVICE (ONLY AFTER THE FIRST 2000 HOURS)

Check injector setting load, adjust	4- 18
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WHEN REQUIRED

Check, clean or replace air cleaner	4- 19
Clean inside of cooling system	4- 25
Check level of window washer fluid, add fluid	4- 28
Clean air conditioner air filter	4- 28
Check refrigerant (gas) level	4- 29
Check dump body	4- 29
Check electric intake air heater	4- 29
Check length of suspension cylinder, check oil level	4- 30
Bleed air from rear brake	4- 32
Bleed air from front brake	4- 33
Bleed air from parking brake	4- 34
Clean, check radiator fins and after cooler fins	4- 35
Check play of output coupling of output shaft	4- 35
Selection and inspection of tires	4- 36

CHECK BEFORE STARTING

EVERY 250 HOURS SERVICE

Check oil level in differential case, add oil	4- 40
Check oil level in final drive case, add oil	4- 40
Lubrication	4- 41
Check drive shaft	4- 42
Check level of battery electrolyte	4- 43
Check alternator belt tension, adjust	4- 45
Check air conditioner compressor belt tension, adjust	4- 46
Clean breathers	4- 47
Check frame	4- 48
Check braking capacity of foot brake	4- 48
Check braking capacity of retarder brake	4- 49
Check braking capacity of parking brake	4- 49
Check, clean automatic suspension	4- 50

EVERY 500 HOURS SERVICE

Change oil in engine oil pan, replace engine oil filter cartridge -----	4- 51
Replace fuel filter cartridge -----	4- 52
Clean fuel tank strainer -----	4- 54
Replace transmission oil filter element -----	4- 55
Check wear of front disc brake pads -----	4- 56
Check fan belt for wear and replace -----	4- 57

EVERY 1000 HOURS SERVICE

Replace corrosion resistor cartridge -----	4- 58
Change oil in transmission case, clean transmission case strainer -----	4- 59
Replace transmission and rear brake cooling oil filter element -----	4- 61
Replace brake oil filter element -----	4- 62
Lubrication -----	4- 63
Check wear of rear brake disc -----	4- 64
Check tightening parts of turbocharger -----	4- 64
Check play of turbocharger rotor -----	4- 64

EVERY 2000 HOURS SERVICE

Replace steering, hoist oil tank filter element -----	4- 65
Clean hydraulic tank strainer -----	4- 66
Change oil in final drive case -----	4- 67
Change oil in differential case -----	4- 67
Clean differential case breather -----	4- 68
Clean engine breather element -----	4- 68
Check alternator, starting motor -----	4- 69
Check, adjust engine valve clearance -----	4- 69
Clean, check turbocharger -----	4- 69
Check accumulator gas pressure -----	4- 69

EVERY 4000 HOURS SERVICE

Change oil in steering, hoist oil tank -----	4- 70
Lubricate drive shaft -----	4- 70
Check water pump -----	4- 70
Check fan pulley and tension pulley -----	4- 70
Check vibration damper -----	4- 70

EVERY 15000 HOURS SERVICE

CHECK, REPLACE STEERING A ARM MOUNTING BOLT -----	4- 71
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SERVICE PROCEDURE

INITIAL 250 HOURS SERVICE (ONLY AFTER THE FIRST 250 HOURS)

Perform the following maintenance only after the first 250 hours.

- Change oil in engine oil pan, replace engine oil filter cartridge
- Replace transmission oil filter element
- Change oil in transmission case
- Replace transmission and rear brake cooling oil filter element
- Replace steering, hoist oil tank filter element
- Clean hydraulic tank strainer
- Change oil in final drive case
- Change oil in differential case
- Change oil in steering, hoist oil tank

For details of the method of replacing or maintaining, see EVERY 500 HOURS, EVERY 1000 HOURS, EVERY 2000 HOURS SERVICE and EVERY 4000 HOURS SERVICE.

INITIAL 2000 HOURS SERVICE (ONLY AFTER THE FIRST 2000 HOURS)

Perform the following maintenance after 2000 hours of traveling only for the first maintenance of the new car.

CHECK INJECTOR SETTING LOAD, ADJUST

The special tools are needed for the check and adjustment.

Ask your Komatsu distributor for checking and adjustment.

WHEN REQUIRED

CHECK, CLEAN OR REPLACE AIR CLEANER

After the outer element has been cleaned 6 times, or if the air cleaner element has been used for one year, replace the outer element, inner element, and O-ring. For details of the procedure for replacement, see "REPLACE ELEMENT (PAGE 4-23)".

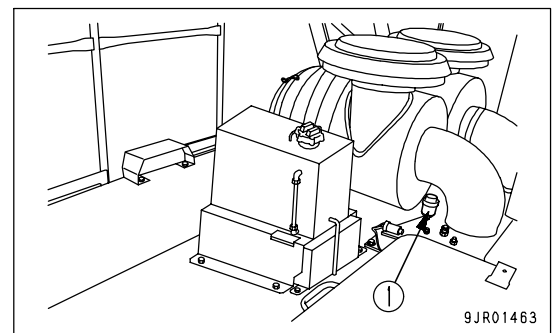
After the outer element has been cleaned, if the maintenance caution lamp lights up and action code E01 and AIR FILTER are displayed on the character display at the same time immediately after operations start, replace the element even if the outer element has not been cleaned 6 times or the air cleaner element has not been used for one year.

CHECKING

NOTICE

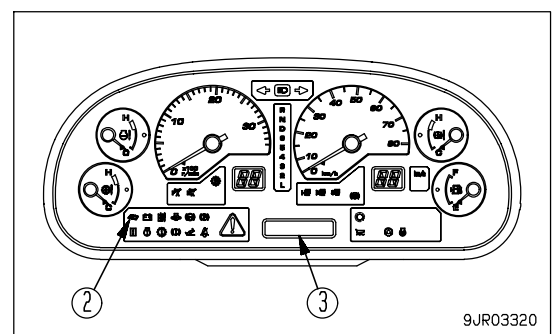
Do not replace the element before the dust indicator reaches 7.5 kPa. If it is cleaned frequently, the filtering effect of the air cleaner will drop, and this will reduce the service life of the engine.

1. Check if the dust indicator (1) displays 7.5 kPa. If it is displaying 7.5 kPa, clean the outer element.



REMARK

Maintenance caution lamp (2) is on the machine monitor. If the maintenance caution lamp lights up and E01 and AIR FILTER are displayed on character display (3), the air cleaner is clogged. If this happens, clean the air cleaner element.



CLEAN OUTER ELEMENT

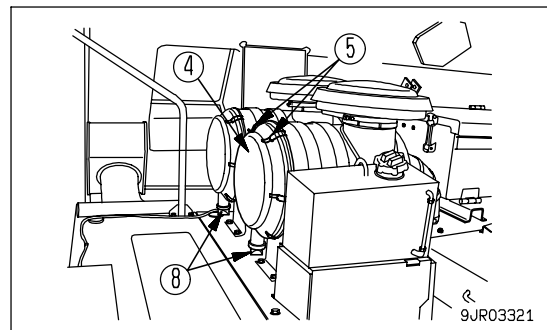

WARNING

- Dirt will fly if compressed air is used for cleaning. If dirt gets into your eyes it may cause blindness, and if you breathe in the dust it may damage your lungs. To prevent these problems, always wear safety glasses, dust mask, and other protective equipment.
- When pulling out the air cleaner element, make sure that you are standing on a firm place. If your footing is not secure when you carry out the operation, there is danger of falling and suffering injury.

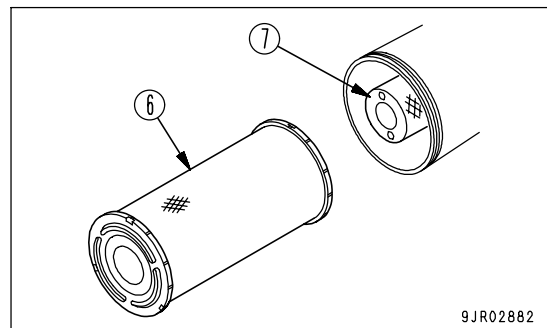
NOTICE

When cleaning the element, clean only the outer element. Do not clean the inner element. There is danger that dirt and dust may get inside the engine when the outer element is being cleaned, and this will damage the engine.

1. Stop the engine.
2. Remove 6 hooks (5) of dust cup (4), then remove the dust cup.

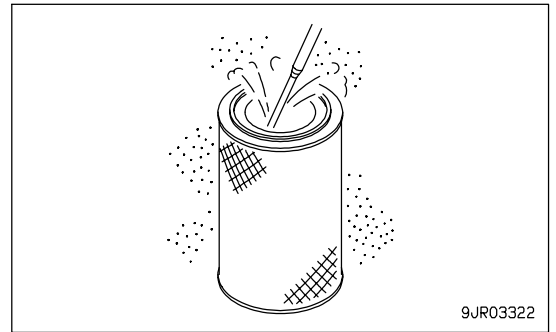


3. Hold outer element (6) with both hands, and move it up and down and to the left and right while pulling it out.
4. Hold inner element (7) so that it does not come out, and clean the inside of the air cleaner body with a dry cloth.
5. Use a dry cloth or compressed air to clean off the dirt stuck to dust cup (4) and vacuator valve (8).
6. Check that there are no cracks in the lip of the vacuator valve (8). If any cracks are found, replace with a new part.

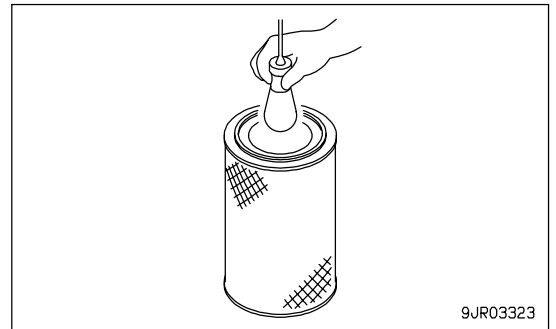
**NOTICE**

- If a damaged element is used, dust will pass the air cleaner filter and be sucked into the engine. Do not use any cleaning method that will damage the element. If the element is damaged, replace it with a new element.
- Never tap or hit the element against any other object when cleaning it.
- Do not use an element with damaged folds or a damaged gasket or seal.

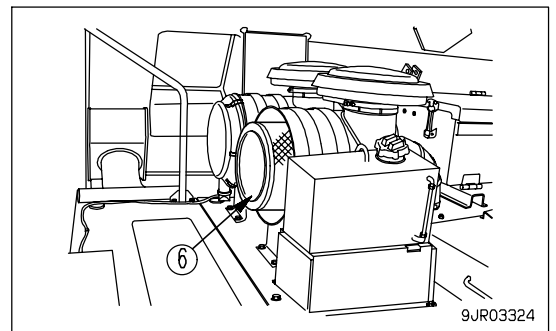
7. Blow dry compressed air (0.69 MPa {7 kg/cm²}) from the inside of outer element (6) along the folds. Next, blow along the folds from the outside, then blow again from the inside.



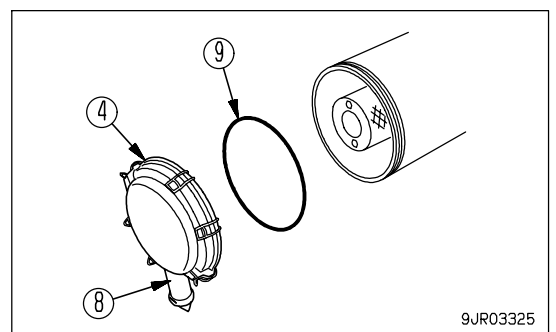
8. After cleaning, shine a light bulb from inside outer element (6) to check. If any holes or thin places are found, replace the outer element.



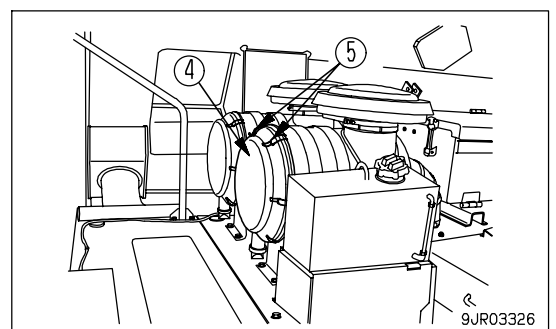
9. Install outer element (6) in the air cleaner body.



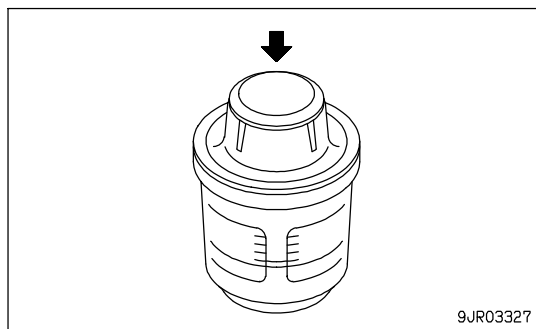
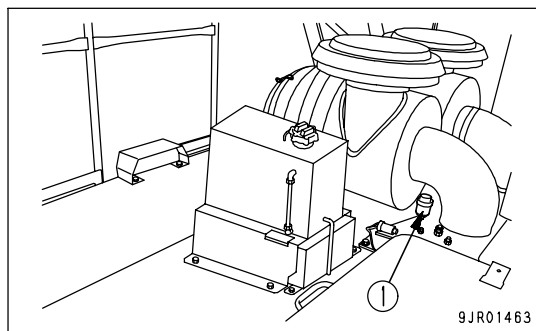
10. Check that O-ring (9) is fitted to dust cup (4). Next, set so that vacuator valve (8) of dust cup (4) is at the bottom, and insert it into the air cleaner body.



11. Clip hooks (5) of dust cup (4) to the protruding parts of the air cleaner body to lock in position.



12. Push the head of dust indicator (1) to cancel the clogging display.

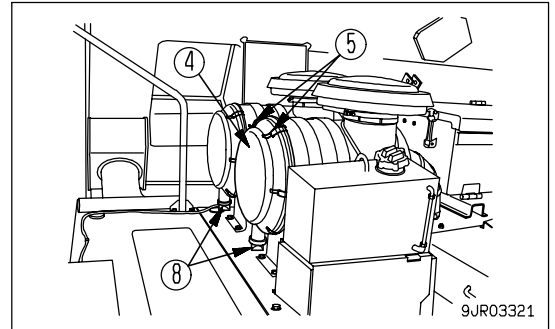


REPLACE ELEMENT

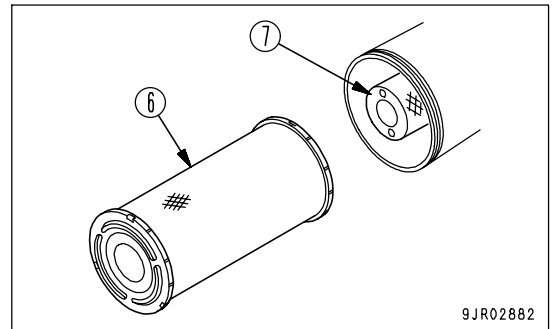
WARNING

When pulling out the air cleaner element, make sure that you are standing on a firm place. If your footing is not secure when you carry out the operation, there is danger of falling and suffering injury.

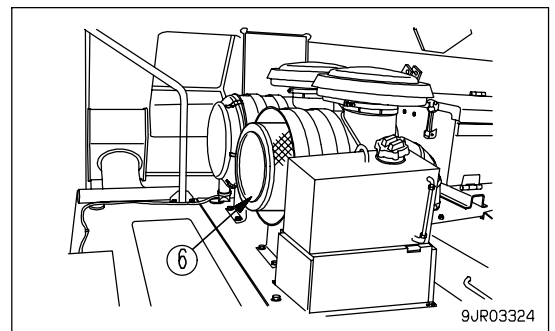
1. Stop the engine.
2. Remove 6 hooks (5) of dust cup (4), then remove the dust cup.



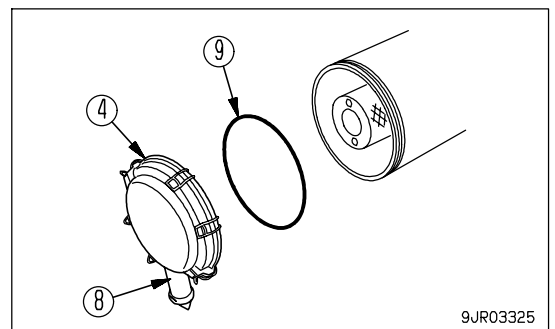
3. Hold outer element (6) with both hands, and move it up and down and to the left and right while pulling it out.
4. Hold inner element (7) so that it does not come out, and clean the inside of the air cleaner body with a dry cloth.
5. Use a dry cloth or compressed air to clean off the dirt stuck to dust cup (4) and vacuator valve (8).
6. Check that there are no cracks in the lip of the vacuator valve (8). If any cracks are found, replace with a new part.



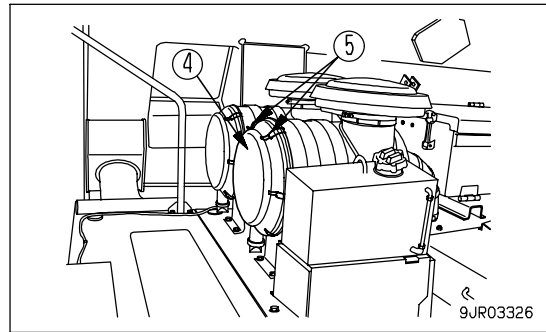
7. Pull out inner element (7) and install a new inner element.
8. Install outer element (6) in the air cleaner body.



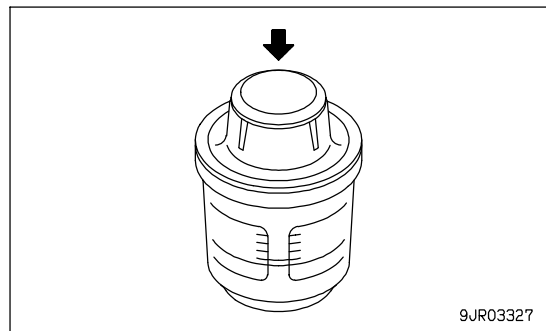
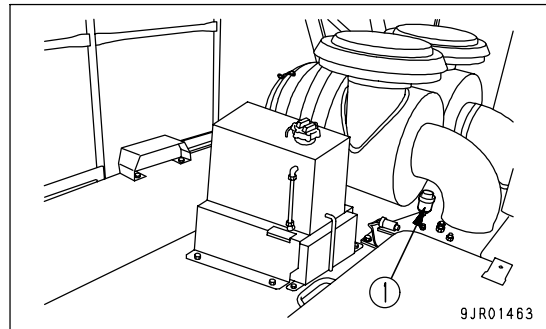
9. Replace O-ring (9) with a new part.
Next, set so that vacuator valve (8) of dust cup (4) is at the bottom, and insert it into the air cleaner body.



10. Clip hooks (5) of dust cup (4) to the protruding parts of the air cleaner body to lock in position.



11. Push the head of dust indicator (1) to cancel the clogging display.



CLEAN INSIDE OF COOLING SYSTEM

 **WARNING**

- Immediately after the engine is stopped, the engine coolant is hot and the pressure inside the radiator is high. Removing the cap and draining the water under this condition could cause burns. Allow the engine to cool down, then turn the cap slowly to release the pressure.
- Start the engine and flush the system. When standing up or leaving the operator's seat, set the shift lever to the N position and set the parking brake switch to the PARKING position.
- For details of starting the engine, see "OPERATIONS, CHECKS BEFORE STARTING (PAGE 3-80)" and "STARTING ENGINE (PAGE 3-82)" in the OPERATION section of the Operation and Maintenance Manual.
- When the undercover is removed, there is danger of touching the fan.
Never go to the front of the machine when the engine is running.

Clean the inside of the cooling system, change the coolant and replace the corrosion resistor according to the table below.

Antifreeze coolant	Interval of cleaning inside of cooling system and changing antifreeze coolant	Replacing corrosion resistor
Komatsu supercoolant (AF-NAC)	Every two years or every 4000 hours whichever comes first	Every 1000 hours and when cleaning the inside of the cooling system and when changing coolant.
Permanent type antifreeze (All-season type, *)	Every year (autumn) or every 2000 hours whichever comes first.	

*: Permanent type antifreeze shall meet the requirements of ASTM D3306-03.

Stop the machine on level ground when cleaning or changing the coolant. The coolant has the important function of preventing corrosion as well as preventing freezing. Even in the areas where freezing is not an issue, the use of antifreeze coolant is essential. Komatsu machines are supplied with Komatsu Supercoolant (AF-NAC). Komatsu Supercoolant (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for 2 years or 4000 hours. Komatsu Supercoolant (AF-NAC) is strongly recommended wherever available. To maintain the anticorrosion properties of Supercoolant (AF-NAC), always keep the density of Supercoolant between 30% and 68%.

When deciding the ratio of antifreeze to water, check the lowest temperature in the past, and decide from the mixing table given below.

It is actually better to estimate and temperature about 10°C (18°F) lower when deciding the mixing ratio.

The mixing ratio depends on the ambient temperature, but it should always be a minimum of 30% by volume (antifreeze/total amount of coolant x 100).

The freezing temperature of undiluted antifreeze is -15°C (5°F). Do not store undiluted antifreeze at a temperature of below -15°C (5°F).

Mixing rate of water and antifreeze

Min. atmospheric temperature	°C	Above -10	-15	-20	-25	-30
	°F	Above 14	5	-4	-13	-22
Amount of antifreeze	Liters	46	56	63	71	77
	US gal	12.2	14.8	16.6	18.8	20.35
Amount of water	Liters	108	98	91	83	77
	US gal	28.5	25.9	24.1	21.9	20.35

! WARNING

Antifreeze coolant is flammable, so keep it away from flame.

Antifreeze coolant is toxic. When removing the drain plug, be careful not to get water containing antifreeze coolant on you. If it gets in your eyes, flush your eyes with large amount of fresh water and see a doctor at once.

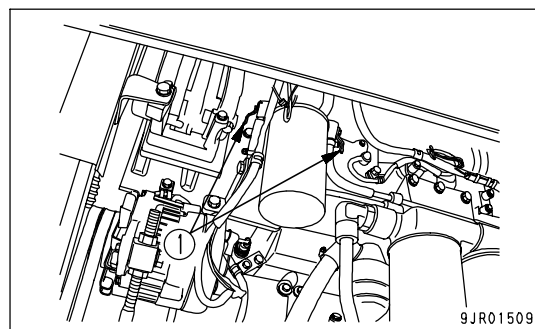
Use antifreeze and appropriate water for diluting (for details, see "COOLANT AND WATER FOR DILUTION (PAGE 4-5)")

We recommend use of an antifreeze density gauge to control the mixing proportions.

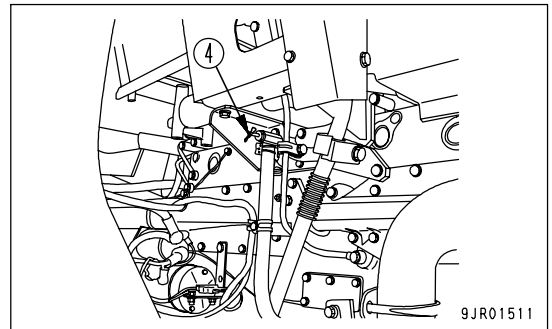
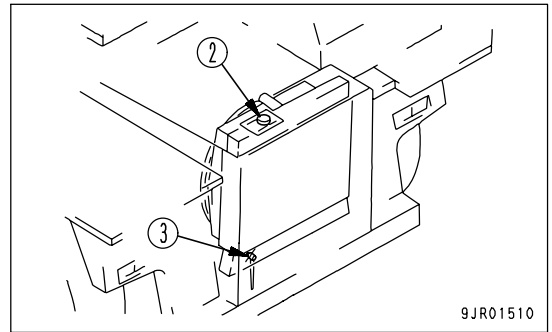
Prepare a container whose capacity is larger than the specified coolant volume to catch drained coolant.

Prepare a hose to supply antifreeze coolant and water.

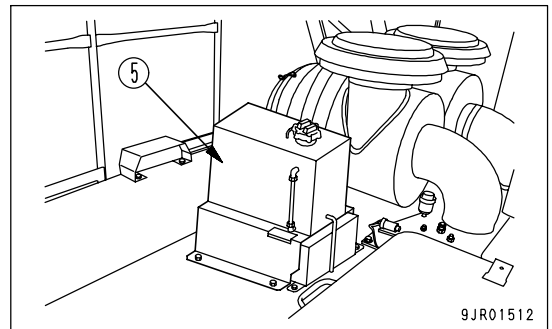
1. Stop the engine, then tighten 2 valves (1) of the corrosion resistor.



2. Turn radiator cap (2) slowly to remove it.
3. Open drain valve (3) at the bottom of the radiator and drain valve (4) at the side face of the cylinder block and drain the coolant.
4. After draining the coolant, close drain valves (3) and drain plug (4), and fill with tap water.
5. When the radiator is full, start the engine, and run it at low idle. Keep the engine running at low idle for 10 minutes until the coolant temperature reaches more than 90°C (194°F).
6. Stop the engine, open drain valves (3) and drain plug (4), and drain the water. After draining the water, close them.
7. After draining the water, clean the cooling system with cleaning agent.
For the cleaning method, see the instructions for the cleaning agent.
8. After flushing, open drain valves (3) and drain plug (4), and drain all the water.
9. Close drain valves (3) and drain plug (4).



10. Replace the corrosion resistor, then open a valve (1) of the corrosion resistor at two points.
For replacing corrosion resistor, see "REPLACE CORROSION RESISTOR CARTRIDGE (PAGE 4-58)".
11. Add coolant mixed with antifreeze until it overflows from the water filler.
Decide the proportions of antifreeze and water according to the table for the mixing rate of water and antifreeze.
12. To remove the air contained in the coolant, run the engine at low idle for 5 minutes, then run for another 5 minutes at high idle. (When doing this, leave the coolant filler cap OFF.)
13. Stop the engine. About 3 minutes later, supply the coolant up to the coolant filler, then close radiator cap.
14. After draining off the coolant of subtank (5), clean the inside of the subtank and refill the coolant between FULL and LOW level.



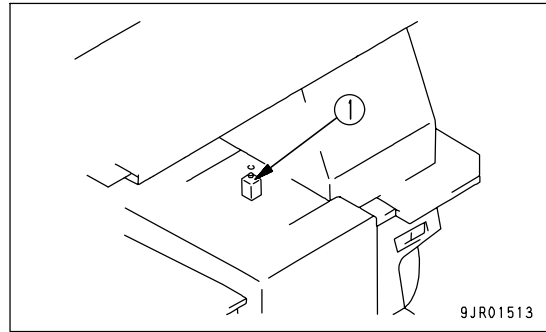
CHECK LEVEL OF WINDOW WASHER FLUID, ADD FLUID

Carry out this check if there is air in the window washer fluid.

Check the level of the fluid in window washer tank (1), and if it is low, fill with automobile window washer fluid.

Be careful not to let dirt or dust get in when adding fluid.

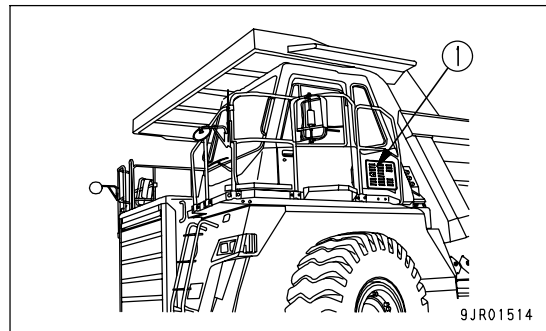
When operating at below freezing point, use fluid with antifreeze.



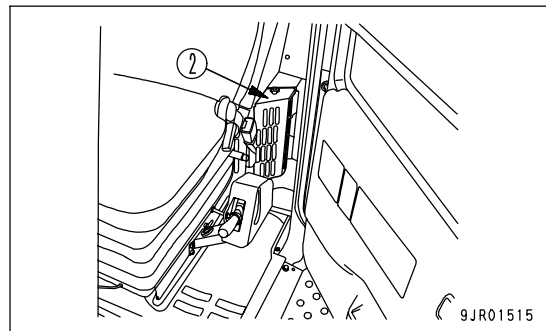
CLEAN AIR CONDITIONER AIR FILTER

If the air filter at the suction port of the air conditioner unit or the air filter at the fresh air intake port become clogged, the cooling or heating capacity will drop, so clean the filters once a week.

1. Open cover (1) at the side of the cab.
2. Pull out the air filter (FRESH filter) and clean it with compressed air.



3. Open cover (2) at the left side at the rear of the operator's seat.
4. Pull out the air filter (recirculated air filter) in the air conditioner unit suction port at the end of the duct, and blow off the dust with a weak flow of compressed air or with a soft brush.



CHECK REFRIGERANT (GAS) LEVEL

 **WARNING**

If the refrigerant used in the air conditioner gets into your eyes or on your hands, it may cause loss of sight or frostbite. Do not touch the refrigerant. Never loosen any part of the refrigerant circuit.

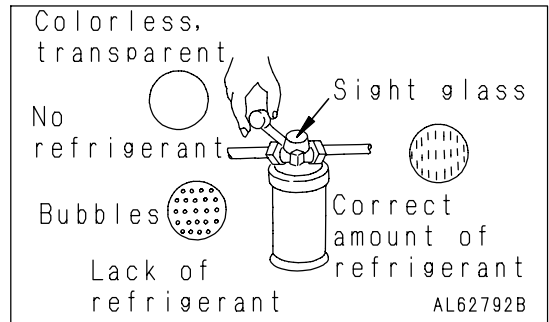
Do not bring any flame close to any point where the refrigerant gas is leaking.

If the cooling effect is poor, the level of the refrigerant (gas) is probably low.

Check the sight glass of the receiver dryer on the inside left of the radiator guard.

REMARK

Run the engine at idle, and if bubbles appear in the sight glass when the air conditioner is set to cooling, the refrigerant level is low, so please contact your Komatsu distributor to have it refilled.



CHECK DUMP BODY

Check that there are no cracks in the dump body.

1. Clean the dump body to make it easier to check.
2. Check all parts of the dump body for damage.
 - If any cracks or abnormal wear are found, carry out repairs.
 - Contact your Komatsu distributor for details of the repair procedure.

CHECK ELECTRIC INTAKE AIR HEATER

Before the start of the cold season (once a year), contact your Komatsu distributor to have the electrical intake air heater checked for dirt or disconnections.

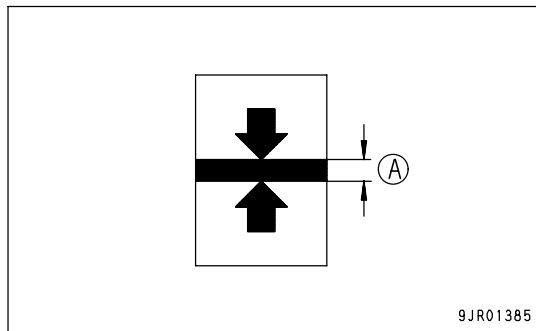
CHECK LENGTH OF SUSPENSION CYLINDER, CHECK OIL LEVEL

When traveling, if the unevenness of the road surface is transmitted directly to the chassis (the machine bounces or the cylinders retract and hit the stopper), carry out the following checks.

CHECK LENGTH OF CYLINDER

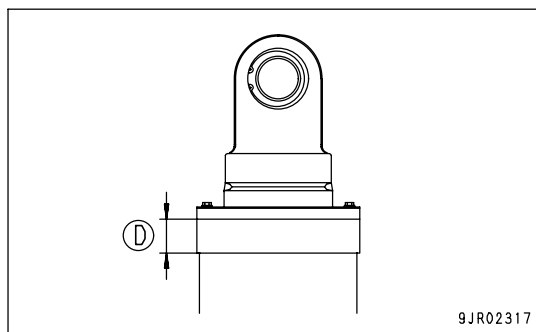
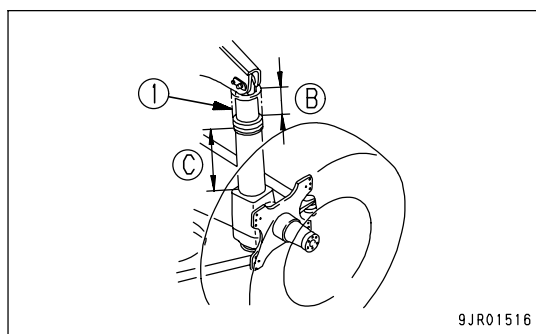
Front

Check that the bottom of the suspension cylinder cover is within range (A) shown by the arrow on the label when the machine is unloaded and on flat ground.



At the same time, when the machine is not loaded, remove cover (1), then measure dimension (B) from the shoulder of the rod head of the suspension cylinder to the top surface of the flange.

	Standard specification	Buffering specification
(B)	239 - 259 mm (9.4 - 10.2 in)	239 - 259 mm (9.4 - 10.2 in)
Reference (C)	506 - 526 mm (19.9 - 20.7 in)	506 - 526 mm (19.9 - 20.7 in)
Flange thickness (D)	50 mm (2.0 in)	50 mm (2.0 in) There is semicircular groove around outside diameter of flange

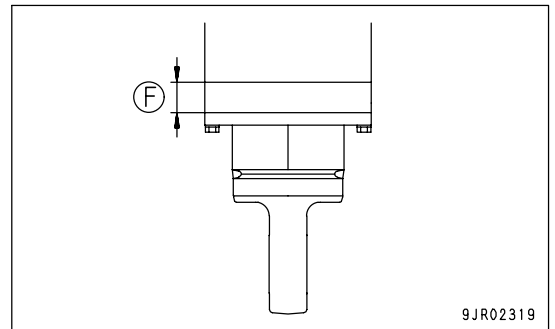
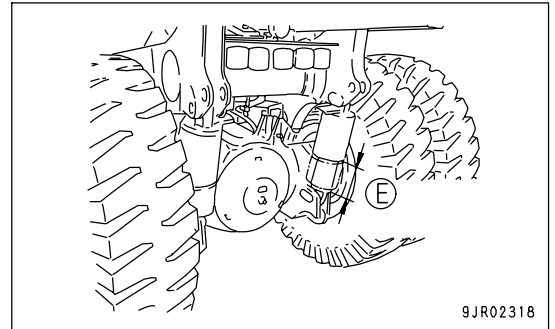


After checking, contact your Komatsu distributor for repairs if any problem is found.

Rear

Measure dimension (E) from the shoulder of the rod head of the suspension cylinder to the top surface of the flange.

	Standard specification	Buffering specification
(E)	210 - 230 mm (8.3 - 9.1 in)	194 - 214 mm (7.6 - 8.4 in)
Flange thickness (F)	49 mm (1.9 in)	65 mm (2.6 in)



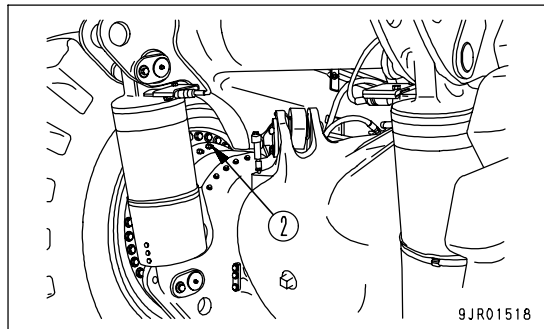
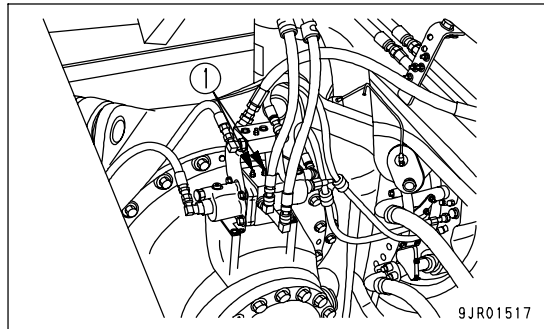
After checking, contact your Komatsu distributor for repairs if any problem is found.

BLEED AIR FROM REAR BRAKE**WARNING**

Stop the machine on level ground and put blocks under the wheels before bleeding the air.

To make it easier to bleed the air, warm the oil up to a temperature of at least 40°C (104°F) before bleeding the air. Bleed the air from the rear brakes in the same way on both the left and right sides.

1. Start the engine, check that the oil in the transmission case is the specified level, and check if the brake oil pressure caution lamp is out.
2. Remove the cap installed to bleeder screw (1) of the slack adjuster, then insert a vinyl hose.
Prepare a container with oil in it and insert the other end of the hose approx. 50 mm (2.0 in) below the surface of the oil.
(Use any commercially available vinyl hose.)
3. Depress the brake pedal and loosen bleeder screw (1) approx. 3/4 turns. Keep the pedal depressed until no more bubbles come out from the vinyl hose.
4. Pull the retarder control lever and loosen bleeder screw (1) approx. 3/4 turns. Keep the retarder control lever depressed until no more bubbles come out from the vinyl hose.
5. After bleeding the air, tighten bleeder screw (1) securely and fit the cap.
6. The procedure for bleeder screw (2) of the rear brake is the same as for the slack adjuster (with Step 4 excluded).
7. Add oil. For details, see "CHECK OIL LEVEL IN TRANSMISSION CASE, ADD OIL (PAGE 3-72)".



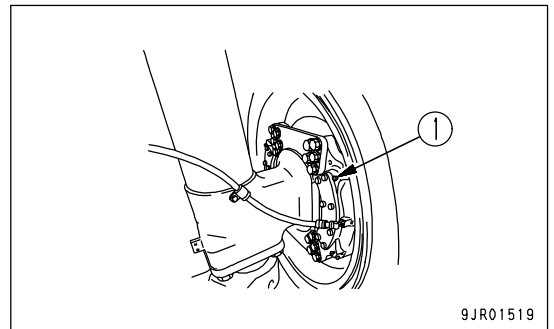
BLEED AIR FROM FRONT BRAKE**WARNING**

Stop the machine on level ground and put blocks under the wheels before bleeding the air.

To make it easier to bleed the air, warm the oil up to a temperature of at least 40°C (104°F) before bleeding the air. Repeat the same procedure on the left and right sides.

When bleeding the air from the front brakes and rear brakes at the same time, bleed the air from the rear brakes first.

1. Start the engine, check that the oil in the transmission case is at the specified level, that the brake oil pressure caution lamp is out, and that the front brake cut-off switch is at the OFF position.
2. Remove the cap of bleeder screw (1), then insert a vinyl hose (inside diameter: 8 mm (0.315 in)). Prepare a container with oil in it and insert the other end of the hose approx. 50 mm (2.0 in) into the oil. (Use any commercially available vinyl hose.)
3. Depress the brake pedal and loosen bleeder screw (1) approx. 3/4 turns. Keep the pedal depressed until no more bubbles come out from the vinyl hose.
4. After bleeding the air, tighten bleeder screw (1) securely and fit the cap.



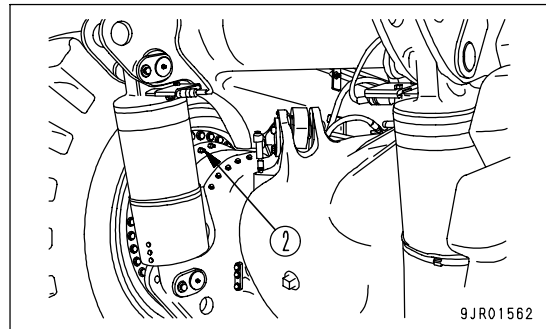
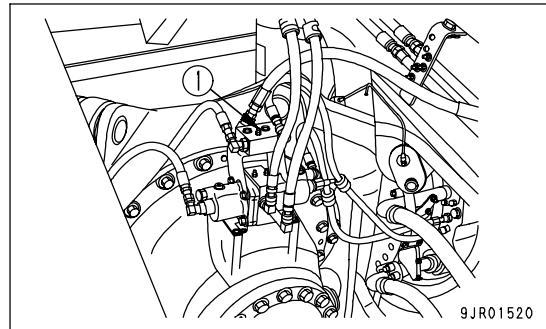
5. Add oil. For details, see "CHECK OIL LEVEL IN TRANSMISSION CASE, ADD OIL (PAGE 3-72)".

BLEED AIR FROM PARKING BRAKE**WARNING**

Stop the machine on level ground and put blocks under the wheels before bleeding the air.

To make it easier to bleed the air, warm the oil up to a temperature of at least 40°C (104°F) before bleeding the air. Bleed the air from the parking brakes in the same way on both the left and right sides.

1. Start the engine, check that the oil in the transmission case is the specified level, and check if the brake oil pressure caution lamp is out.
2. Remove the cap of bleeder screw (1), install to the block at the top of the slack adjuster, then insert a vinyl hose. Prepare a container with oil in it and insert the other end of the hose approx. 50 mm (2.0 in) into the oil. (Use any commercially available vinyl hose.)
3. Pull the retarder control lever, set the parking brake switch to TRAVEL, then loosen bleeder screw (1) approx. 3/4 turns. Continue until no more bubbles come out from the vinyl hose.
4. After bleeding the air, tighten bleeder screw (1) securely and fit the cap.
5. The procedure for parking brake bleeder screw (2) is the same as for the block on top of the slack adjuster.
6. Add oil. For details, see "CHECK OIL LEVEL IN TRANSMISSION CASE, ADD OIL (PAGE 3-72)".



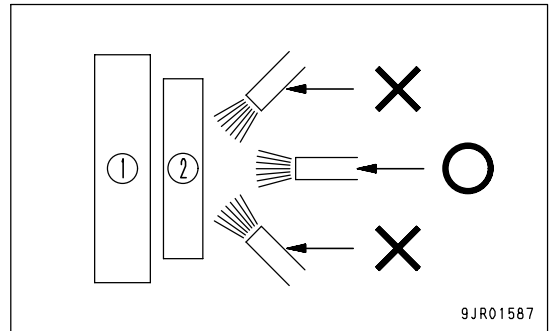
CLEAN, CHECK RADIATOR FINS AND AFTER COOLER FINS

 **WARNING**

If compressed air scattered around dust and debris, there is danger of injury. Always wear protective equipment such as protective glasses and mask.

If radiator fins (1) or aftercooler fins (2) become clogged or bent, it will cause overheating of the engine, so always clean or carry out inspection, and ask your Komatsu distributor to take the necessary action.

- Cleaning can be carried out by using jets of air, steam, or water, but be careful not to let the nozzle contact the fin.
- Air pressure : Max. 0.98 MPa (10 kgf/cm², 142 PSI)
- Steam pressure : Max. 0.39 MPa (4 kgf/cm², 56.8 PSI)
- When using compressed air or steam, keep the nozzle at a right angle to the radiator and after cooler.
- Examine the rubber hose, and if any cracks or brittle places are found, replace the hose. In addition, check also for loose hose clamps.



CHECK PLAY OF OUTPUT COUPLING OF OUTPUT SHAFT

If any abnormal noise occurs around the output shaft or front drive shaft, the rubber inside the output shaft may be deteriorated or damaged, so check the play of the coupling as follows.

Play in circumferential direction

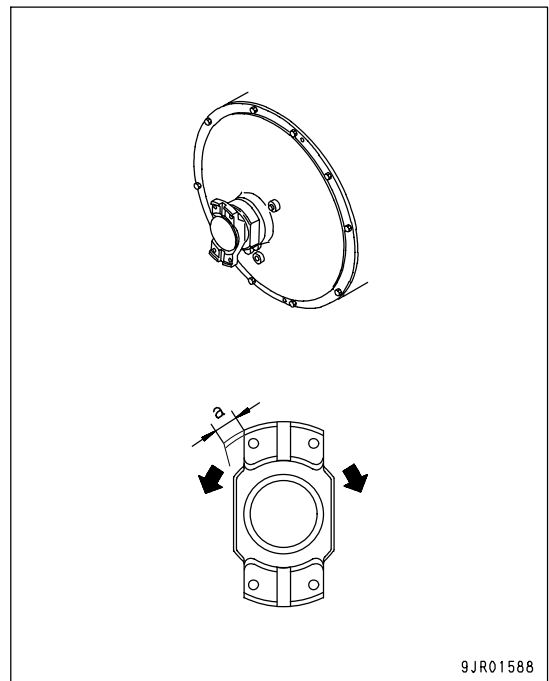
Using a bar, move the coupling in the direction of the circumference and check the play (a) in the circumferential direction at the outside diameter of the coupling.

Standard: Max. 15 mm (0.6 in)

REMARK

If the play range is exceeded, the engine fan will start to rotate, so when inspecting the play, check first that the engine fan is not rotating.

If the result of the measurement shows that it is greater than the standard value, please contact your Komatsu distributor for disassembly and inspection.

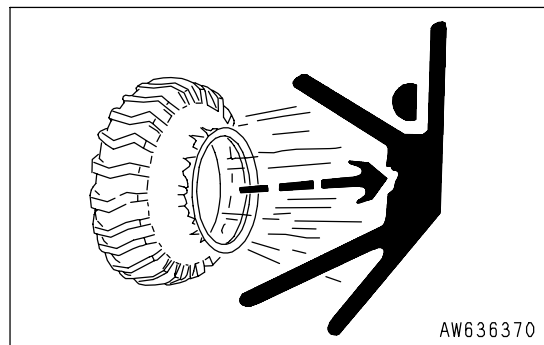


SELECTION AND INSPECTION OF TIRES

! WARNING

If a tire or a rim is handled improperly, the tire may burst or may be damaged and the rim may be broken and scattered, and that can cause serious injury or death.

- Since maintenance, disassembly, repair and assembly of the tires and rims require special equipment and skill, be sure to ask a tire repair shop to do the work.
- Do not heat or weld the rim to which the tire is installed. Do not make a fire near the tire.



SELECTION OF TIRES

! WARNING

Select the tires according to the conditions of use and the weight of the attachments on the machine. Use only specified tires and inflate them to the specified pressure.

Select the tires according to the conditions of use and the weight of the attachments of the machine. Use the following table.

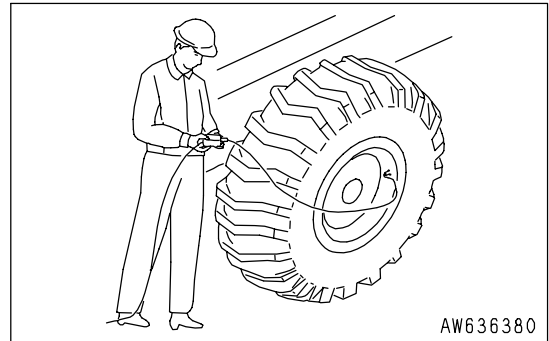
Since the travel speed indicated on the speedometer varies with the tire size, consult your Komatsu distributor when using optional tires.

	Max. load [kg (lb)]	Size	Operating model	Remarks
Front wheel	15500 (34178)	24.00-35-36PR	HD465: standard	Type 1 for construction equipment
	18500 (40793)	24.00R35 ★ ★	HD465: if equipped HD605: standard	
	18500 (40793)	24.00-35-48PR	HD605: if equipped	
Rear wheel	15500 (34178)	24.00-35-36PR	HD465: standard	
	18500 (40793)	24.00R35 ★ ★	HD465: if equipped HD605: standard	
	18500 (40793)	24.00-35-48PR	HD605: if equipped	

CHECK OF INFLATION PRESSURE OF TIRES AND INFLATION OF THEM

WARNING

- When inflating a tire, check that any person will not enter the working area and use an air chuck which has a clip and which can be fixed to the air valve.
- While inflating the tire, check the inflation pressure occasionally so that it will not rise too high.
- If the rim is not fitted normally, it may be broken and scattered while the tire is inflated. Accordingly, place a guard around the tire and do not work in front of the rim but work on the tread side of the tire.
- Abnormal drop of inflation pressure and abnormal fitting of the rim indicate a trouble in the tire or rim. In this case, be sure to ask a tire repair shop for repair.
- Be sure to observe the specified inflation pressure.
- Do not adjust the inflation pressure of the tires just after high-speed travel or heavy-load work.



Check

Measure the inflation pressure with a tire pressure gauge, while the tires are cool, before starting work.

Inflation of tires

Adjust the inflation pressure properly.

When inflating a tire, use an air chuck which can be fixed to the air valve of the tire as shown in the figure. Do not work in front of the rim but work on the tread side of the tire.

The proper inflation pressure is shown below.

- HD465-7

Tire size	Inflation pressure
24.00-35-36PR (standard)	0.47 MPa (4.75 kgf/cm ² , 67.4 PSI)
24.00R35 ★ ★ (if equipped)	0.69 MPa (7.00 kgf/cm ² , 99.4 PSI)

- HD605-7

Tire size	Inflation pressure
24.00R35 ★ ★ (standard)	0.69 MPa (7.00 kgf/cm ² , 99.4 PSI)
24.00-35-48PR (if equipped)	0.64 MPa (6.50 kgf/cm ² , 92.3 PSI)

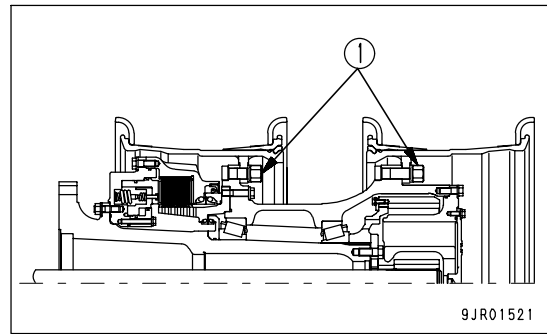
NOTICE

If the tires are used when the inflation pressure is less than the value given in the table above, the rim may be damaged. Always keep the tire inflation pressure within +0 to +0.03 MPa (0.3 kgf/cm², 4.3 PSI) of the value in the table above.

PRECAUTIONS WHEN REPLACING TIRE

If the hub nuts (1) have been tightened again after replacing the tire, travel for 5 to 6 km, then tighten again to settle all the contacting parts.

In particular, there are more contacting parts on the rear wheels than on the front wheels, so it will take time for the parts to settle. For this reason, repeat the tightening process for the first 50 hours after installation.



9JR01521

CHECK BEFORE STARTING

For the following items, see "CHECK BEFORE STARTING (PAGE 3-70)".

- Check coolant level, add coolant
- Check dust indicator
- Check oil level in engine oil pan, add oil
- Check oil level in transmission case, add oil
- Check oil level in steering and hoist oil tank, add oil
- Drain water, sediment from fuel system
- Check fuel level, add fuel
- Check wheel hub nuts, tighten
- Check central warning lamp, alarm buzzer, monitor lamps and meters
- Check braking effect
- Check braking capacity of emergency brake
- Check manual emergency steering
- Check auto-emergency steering
- Check backup alarm
- Check electric wiring
- Check inflation pressure of tires

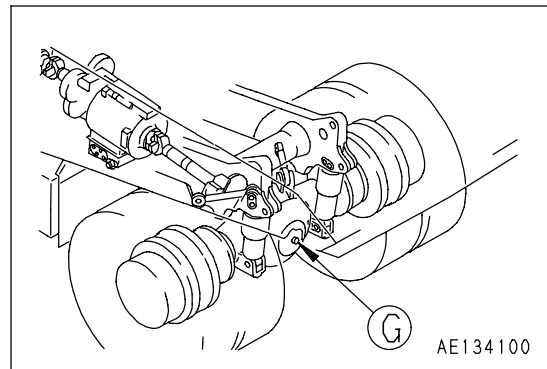
EVERY 250 HOURS SERVICE

CHECK OIL LEVEL IN DIFFERENTIAL CASE, ADD OIL

WARNING

- The parts and oil are at high temperature after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before starting the operation.
- If there is still pressure remaining inside the case, the oil or plug may fly out. Turn the plug slowly to release the pressure, then remove it carefully.

1. Remove plug (G) and check that the oil level is near the bottom of the plug hole.
2. If the oil level is too low, add oil through the plug hole until the oil overflows.

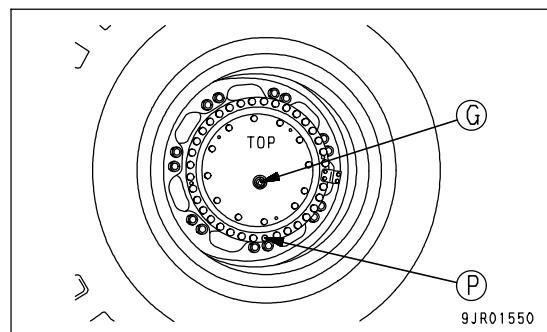


CHECK OIL LEVEL IN FINAL DRIVE CASE, ADD OIL

WARNING

- The parts and oil are at high temperature after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before starting the operation.
- If there is still pressure remaining inside the case, the oil or plug may fly out. Turn the plug slowly to release the pressure, then remove it carefully.

1. Stop the machine so that the TOP casting mark is at the top and drain plug (P) is at the bottom.
2. Remove plug (G) and check that the oil level is near the bottom of the plug hole.
3. If the oil level is too low, add oil through the plug hole until the oil overflows.

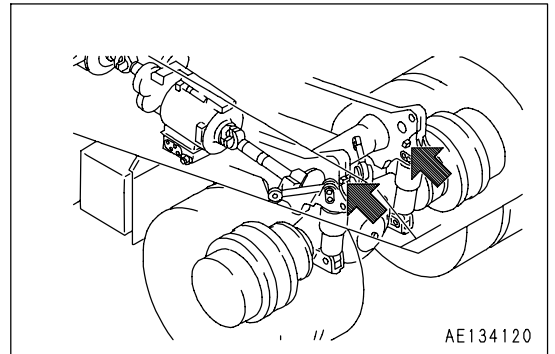


LUBRICATION

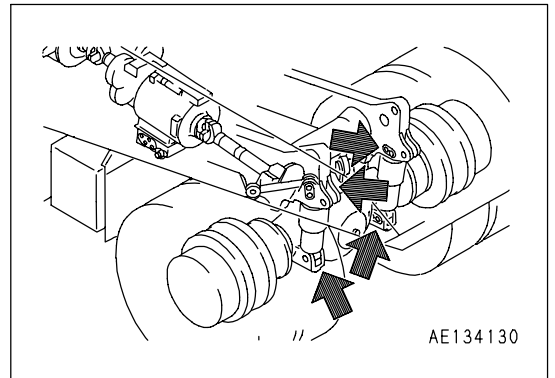
1. Stop the engine.
2. Using a grease pump, pump in grease through the grease fittings marked by the arrows.
3. After greasing, wipe off any old grease that was pushed out.

Carry out the greasing operation every day when operating in places where the grease flows out easily after traveling through mud or water.

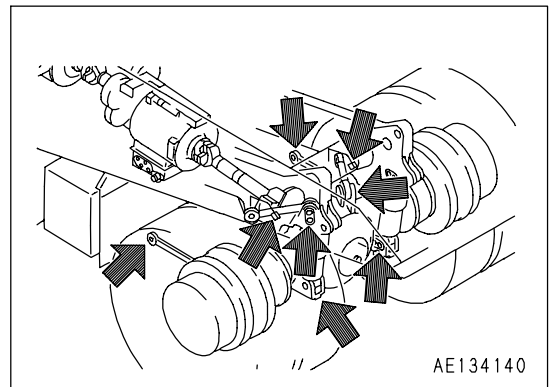
(1) Dump body hinge pin (left and right: 1 place each)



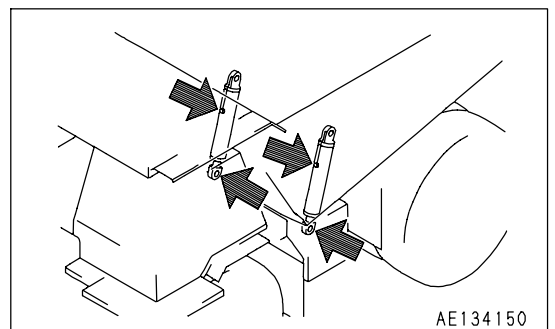
(2) Rear suspension (left and right: 2 places each)



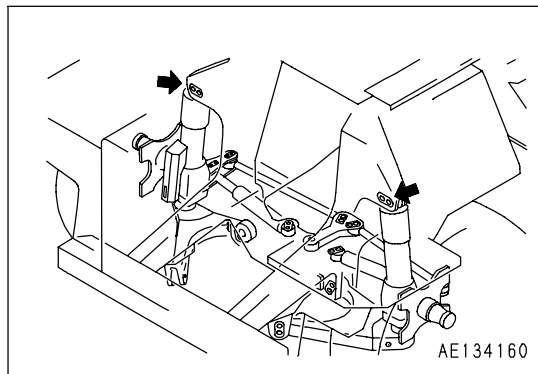
(3) Differential support (left and right: 4 places each)



(4) Hoist cylinder pin (left and right: 2 places each)

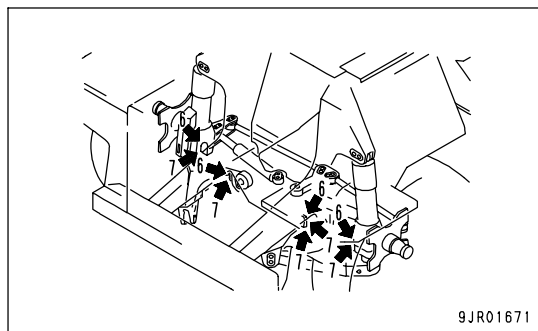


(5) Front suspension (left and right: 1 place each)

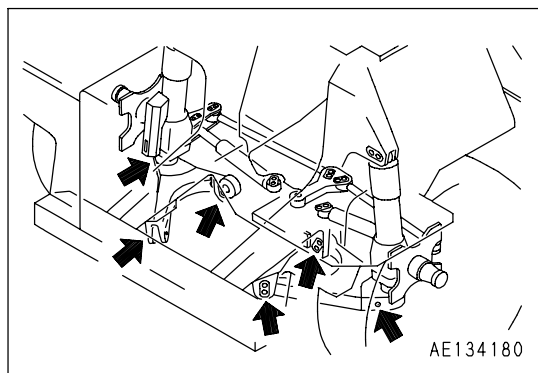


(6) Steering cylinder pin (4 places)

(7) Steering link pin (5 places)

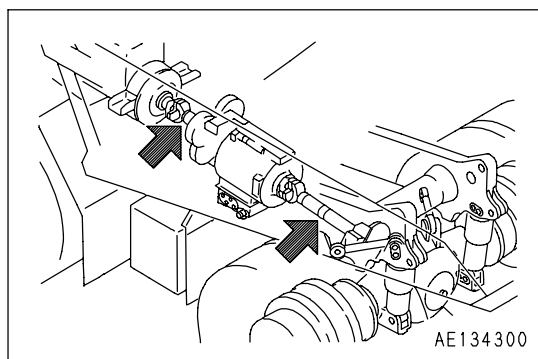


(8) Steering linkage (left and right: 3 places each)



CHECK DRIVE SHAFT

If there is any problem, such as looseness of the drive shaft connection, play in the spline or bearing portion, or runout of the shaft, please contact your Komatsu distributor for repair.



CHECK LEVEL OF BATTERY ELECTROLYTE

Perform this check before operating the machine.

! WARNING

- Do not use the battery if the battery electrolyte level is below the LOWER LEVEL line. This will accelerate deterioration of the inside of the battery and reduce the service life of the battery. In addition, it may cause an explosion.
- The battery generates flammable gas and there is danger of explosion, do not bring fire or sparks near the battery.
- Battery electrolyte is dangerous. If it gets in your eyes or on your skin, wash it off with a large amount of water and consult a doctor.
- When adding distilled water to the battery, do not allow the battery electrolyte to go above the UPPER LEVEL line. If the electrolyte level is too high, it may leak and cause damage to the paint surface or corrode other parts.

NOTICE

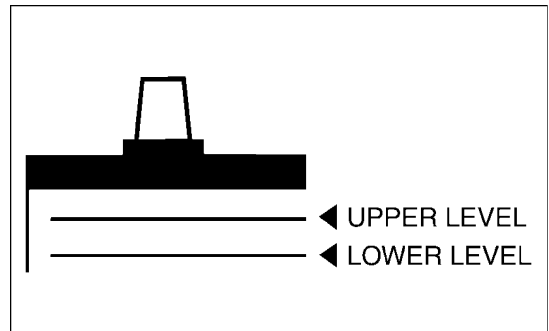
When adding distilled water in cold weather, add it before starting operations in the morning to prevent the electrolyte from freezing.

Inspect the battery electrolyte level at least once a month and follow the basic safety procedures given below.

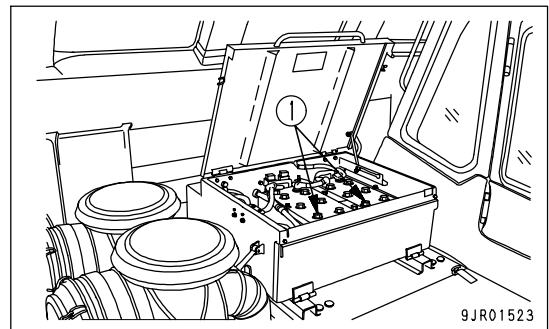
WHEN CHECKING ELECTROLYTE LEVEL FROM SIDE OF BATTERY

If it is possible to check the electrolyte level from the side of the battery, check as follows.

1. Use a wet cloth to clean the area around the electrolyte level lines and check that the electrolyte level is between the UPPER LEVEL (U.L.) and LOWER LEVEL (L.L.) lines.
If the battery is wiped with a dry cloth, static electricity may cause a fire or explosion.



2. If the electrolyte level is below the midway point between the U.L. and L.L. lines, remove cap (1) and add distilled water to the U.L. line.
3. After adding distilled water, tighten cap (1) securely.



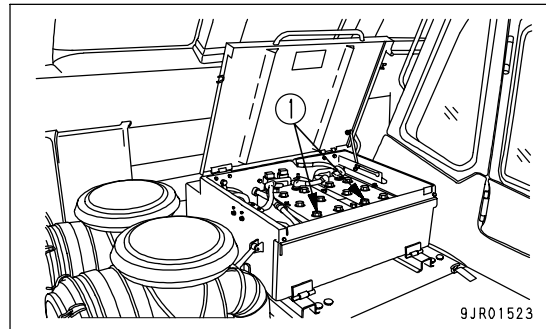
REMARK

If distilled water is added to above the U.L. line, use a syringe to lower the level to the U.L. line. Neutralize the removed fluid with baking soda (sodium bicarbonate), then flush it away with a large amount of water or consult your Komatsu distributor or battery maker.

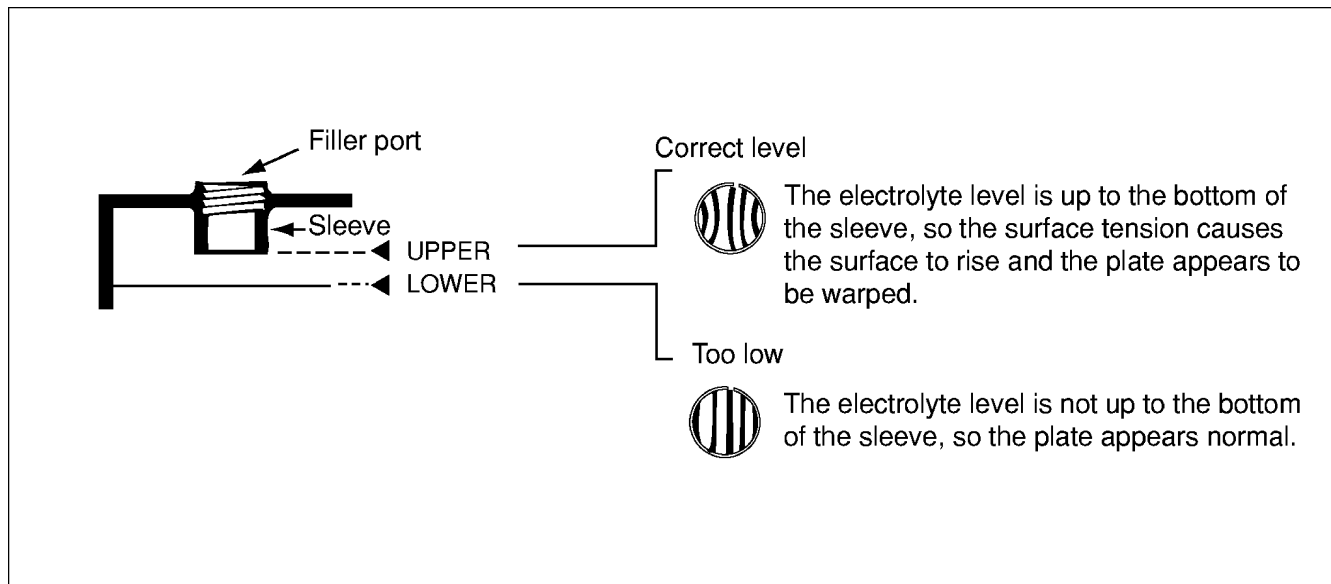
WHEN IT IS IMPOSSIBLE TO CHECK ELECTROLYTE LEVEL FROM SIDE OF BATTERY

If it is impossible to check the electrolyte level from the side of the battery, or there is no display of the UPPER LEVEL line on the side of the battery, check as follows.

1. Remove cap (1) at the top of the battery, look through the water filler port, and check the electrolyte surface. If the electrolyte does not reach the sleeve, add distilled water so that the level reaches the bottom of the sleeve (UPPER LEVEL line) without fail.



Use the diagram below for reference, and check if the electrolyte reaches the bottom of the sleeve.



2. After adding distilled water, tighten cap (1) securely.

REMARK

If distilled water is added to above the bottom of the sleeve, use a syringe to lower the level to the bottom of the sleeve. Neutralize the removed fluid with baking soda (sodium bicarbonate), then flush it away with a large amount of water or consult your Komatsu distributor or battery maker.

WHEN IT IS POSSIBLE TO USE INDICATOR TO CHECK ELECTROLYTE LEVEL

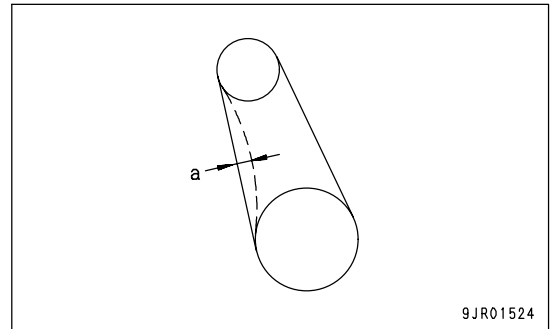
(If equipped)

If it is possible to use and indicator to check the electrolyte level, follow the instructions given.

CHECK ALTERNATOR BELT TENSION, ADJUST

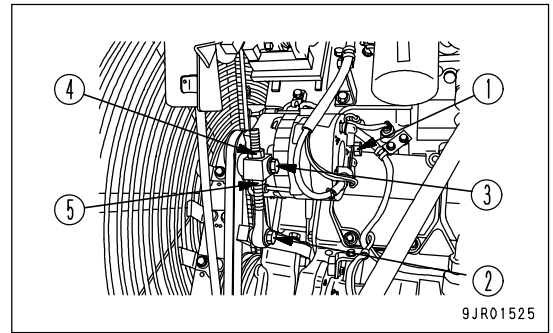
CHECKING

The belt should normally deflect by above 15 mm (0.6 in) (a) when pressed with the thumb (with a force of approx. 58.8 N (6 kgf) at a point midway between the drive pulley and alternator pulley.



ADJUSTING

1. Loosen bolts and nuts (1) to (4), then turn nut (5) to adjust the tension of the belt.
Tighten nut (5) as follows:
TIGHTEN to INCREASE belt tension
LOOSEN to DECREASE belt tension
2. After adjusting the belt, tighten bolts and nuts (1) to (4) in number order to secure the alternator in position.
3. Tighten nut (5).



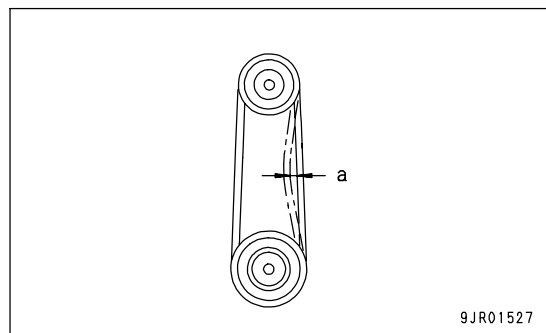
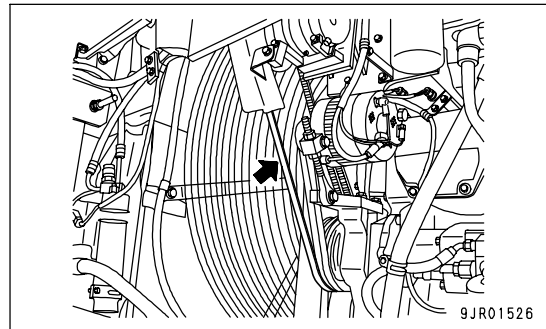
REMARK

- Check each pulley for breakage and wear of the V-groove. In particular, check that the V-belt does not touch the bottom of the V-groove.
- If any problem is found, ask your Komatsu distributor for replacement of the pulley.
- If the V-belt is so lengthened that it cannot be adjusted any more or if it has any cuts or cracks, replace it.
- If the V-belt has been replaced with a new part, there will be initial elongation, so inspect and adjust it again after one-hour of operation.

CHECK AIR CONDITIONER COMPRESSOR BELT TENSION, ADJUST

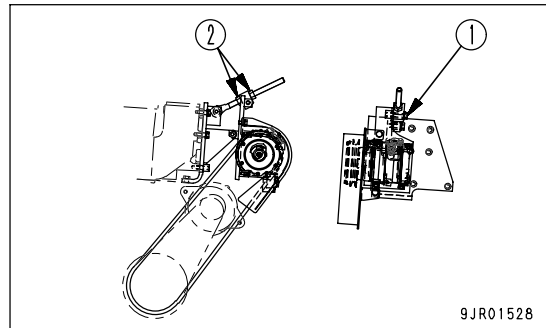
CHECKING

The belt should normally deflect by 10 mm (0.4 in) (a) when pressed with the thumb (with a force of approx. 58.8 N (6 kgf)) at a point midway between the air compressor pulley and drive pulley.



ADJUSTING

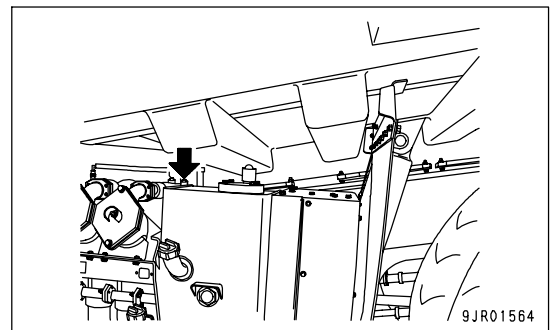
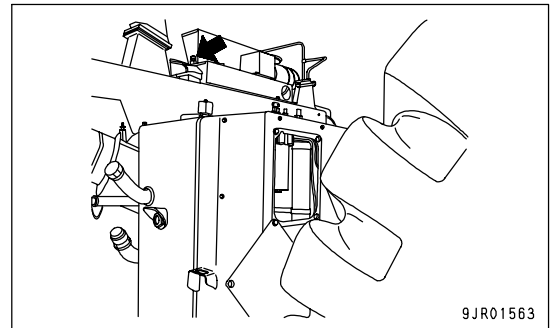
1. Loosen bolt (1).
2. Turn nut (2) to adjust so that the belt deflects by approx. 10 mm (0.4 in) when pressed with a finger force of approx. 58.8 N (6 kgf) at a point midway between the air conditioner compressor pulley and drive pulley.
3. Tighten bolt (1) and nut (2) to secure the compressor in position.
4. Check each pulley for damage, wear of the V-groove, and wear of the V-belt. In particular, be sure to check that the V-belt is not touching the bottom of the V-groove.
5. If the V-belt is so lengthened that it cannot be adjusted any more or if it has any cuts or cracks, replace it.
6. If the V-belt has been replaced with a new part, there will be initial elongation, so adjust the belt again after operating for 2 to 3 days.



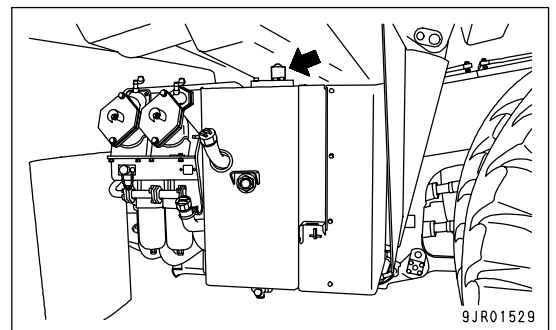
CLEAN BREATHERS

Remove the mud and dirt from around the breathers, then remove the breathers and wash out the dirt with clean diesel oil or flushing oil.

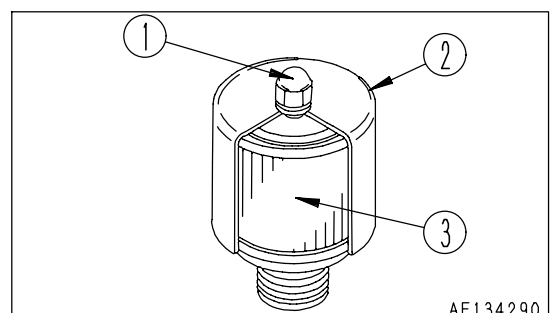
- Transmission case breather (2 places)



- Steering, hoist oil tank



1. Remove nut (1), then remove cover (2) and wash element (3).
2. Install element (3), then install cover (2) and nut (1).



CHECK FRAME

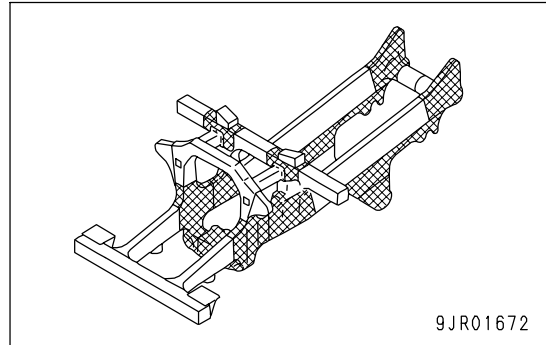


WARNING

When carrying out inspection of the machine with the dump body raised, always set the dump lever to the HOLD position, lock with the safety lock knob, then use the safety pin.

1. Wash the frame to make it easier to check.
2. Check all parts of the frame for damage.

In particular, check the colored portions in the diagram and if any cracks or damage are found, repair the damage. Please contact your Komatsu distributor for details of the repair procedure.



CHECK BRAKING CAPACITY OF FOOT BRAKE

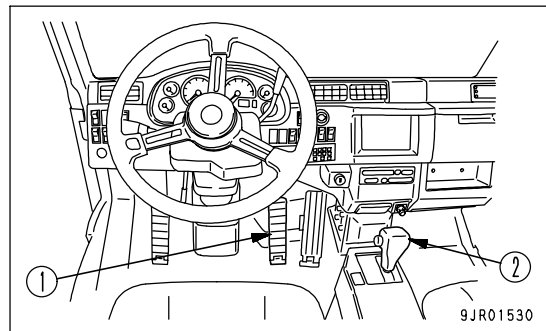


WARNING

If the machine moves, it will lead to serious injury. If machine begins to move during the inspection of braking capacity, lower the engine speed immediately, set shift lever at N position, and then set parking brake switch at PARKING position.

Check the braking capacity of the foot brake as follows.

1. Stop the machine on flat ground and depress service brake (1).
2. Set shift lever (2) to the D position, gradually raise the engine speed, and check that the machine does not move even when the engine speed reaches 1870 rpm. If the machine does not move, it is normal.
3. Lower the engine speed, set shift lever at N position, and then set parking brake valve lever at PARKING position. If any problem is found, ask your Komatsu distributor for repair.



NOTICE

There is danger of damage inside the transmission, so always do this with the shift lever at the "D" position. Do not use any other position.

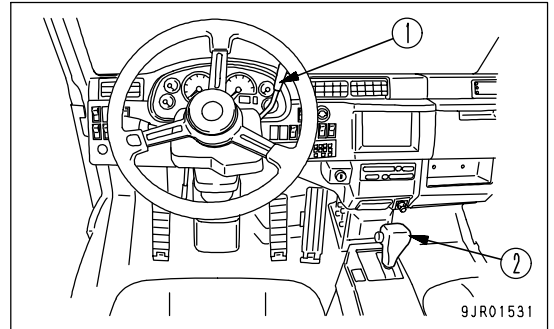
CHECK BRAKING CAPACITY OF RETARDER BRAKE

! WARNING

If the machine moves, it will lead to serious injury or death. If machine begins to move during the inspection of braking capacity, lower the engine speed immediately, set gear shift lever at N position, and then depress the foot brake.

Check the braking capacity of the retarder brake as follows.

1. Stop the machine on flat ground and pull retarder control lever (1) fully.
2. Set shift lever (2) to the D position, gradually raise the engine speed, and check that the machine does not move even when the engine speed reaches 1400 rpm. If the machine does not move, it is normal.
3. Lower the engine speed, set gear shift lever at N position. If any problem is found, ask your Komatsu distributor for repair.



NOTICE

There is danger of damage inside the transmission, so always do this with the shift lever at the "D" position. Do not use any other position.

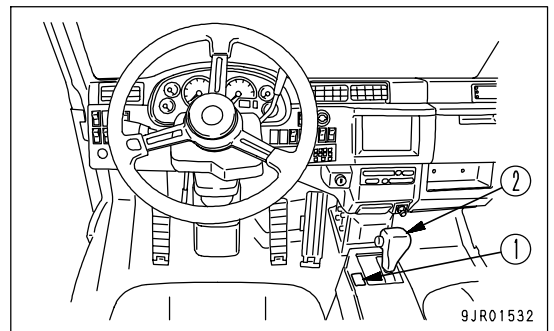
CHECK BRAKING CAPACITY OF PARKING BRAKE

! WARNING

If the machine moves, it will lead to serious injury or death. If machine begins to move during the inspection of braking capacity, lower the engine speed immediately, set gear shift lever at N position, and then depress the foot brake.

Check the braking capacity of the parking brake as follows.

1. Stop the machine on flat ground and set parking brake switch (1) to PARKING.
2. Set shift lever (2) to the D position, gradually raise the engine speed, and check that the machine does not move even when the engine speed reaches 1670 rpm. If the machine does not move, it is normal.
3. Lower the engine speed, set gear shift lever at N position. If any problem is found, ask your Komatsu distributor for repair.



NOTICE

There is danger of damage inside the transmission, so always do this with the shift lever at the "D" position. Do not use any other position.

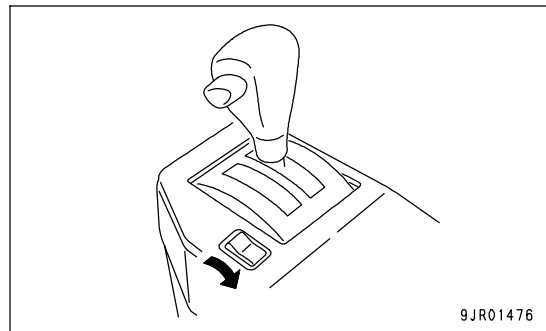
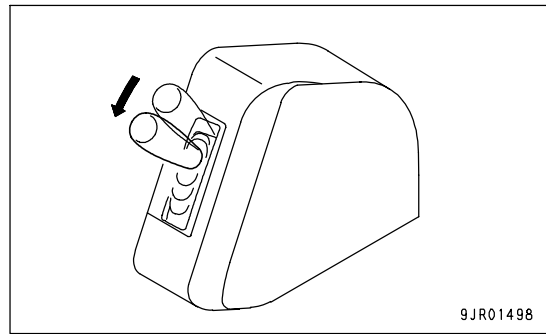
CHECK, CLEAN AUTOMATIC SUSPENSION

(If equipped)

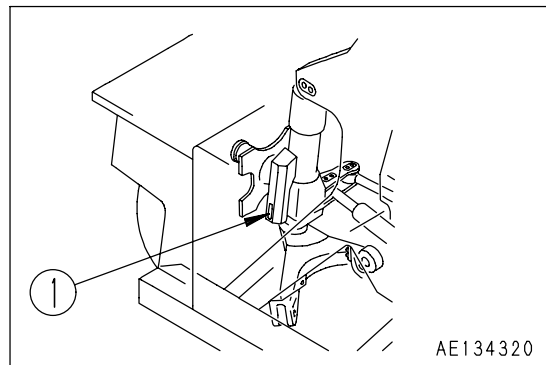
! WARNING

Follow the precautions below strictly.

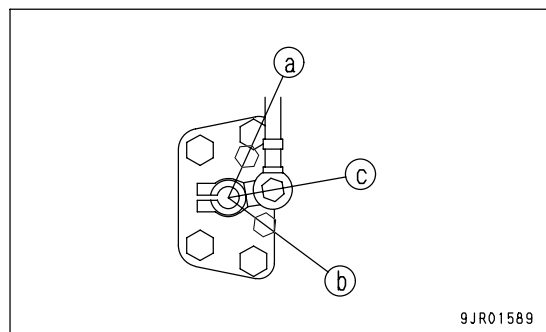
- One should sit on the operator's seat, preparing to stop the engine at any moment, and contact with the other.
- Set the parking brake switch at PARKING position to prevent the machine from moving.
- When working near fan or belts, do not bring your body or any materials closer that can be dragged into.
- Do not touch the gearshift lever. When you operate the dump lever, always give a signal to your fellow workers to tell them to move to a safe area.
- If the materials or tools are dropped onto fan or belts, they fly away or cut. Never drop or insert materials or tools.



1. When bolts of inspection cover (1) are loosened and the cover is moved to the side, the inspection hole can be seen.



2. Check the positions of the link. Check that it moves to the following positions:
 - For normal travel when empty: soft (a)
 - When the brake is depressed: medium (b)
 - When the dump lever is at any position other than FLOAT: hard (c)



If any problem is found, please contact your Komatsu distributor for inspection and adjustment.

If operations are carried out on muddy or wet ground, mud will stick to the link, and the movement may become slow, so check and clean.

EVERY 500 HOURS SERVICE

Maintenance for every 250 hours service should be carried out at the same time.

CHANGE OIL IN ENGINE OIL PAN, REPLACE ENGINE OIL FILTER CARTRIDGE

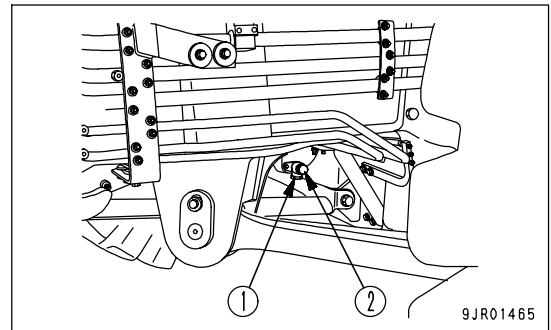


WARNING

The parts and oil is at high temperature after the engine has been operated, and it can result in a burn. Wait for the oil to cool down before changing it.

- Refill capacity: 57 liters (15.6 US gal)
- Prepare a filter wrench

1. Remove drain plug (1), then install the standard drain hose.
2. Set a container in position to catch the oil, then loosen drain the valve (2) slowly to avoid getting oil on yourself, and drain the oil. Be careful not to loosen drain valve (2) too much. This will deform the stopper pin inside the valve.
3. Check the drained oil, and if there are excessive metal particles or foreign material, please contact your Komatsu distributor.
4. Remove the drain hose, then tighten drain valve (2) and drain plug (1).



Tightening torque

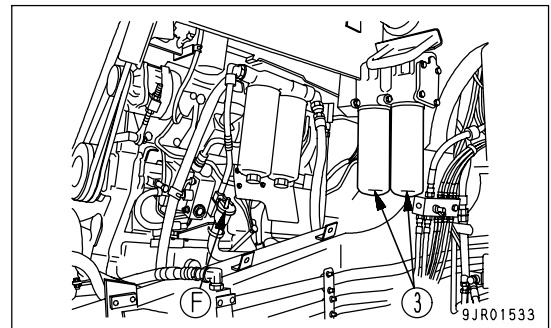
Drain plug (1), drain valve (2): $68.6 \pm 9.8\text{N}\cdot\text{m}$
 $(7 \pm 1 \text{ kgf}\cdot\text{m}, 50.6 \pm 7.2 \text{ lbft})$

Using the filter wrench, turn 2 full-flow filter cartridges (3) to the left to remove them.

When doing this, to prevent getting oil on yourself, do not carry out this operation from immediately under the cartridge.

In particular, if this operation is carried out immediately after stopping the engine, a large amount of oil will come out, so wait for 10 minutes before starting the operation.

5. Clean the filter holder, fill the new filter cartridge with oil, coat the packing face and thread with oil (or coat thinly with grease), then install the filter cartridge.
6. When installing the filter cartridge, tighten until the packing face is in contact with the filter holder, then tighten a further 3/4 - 1 turn.
7. Pour in the specified amount of engine oil from oil filler (F).
8. Run the engine for a short time at idle, then check the oil if it is filled up to a specified level. For details, see "CHECK OIL LEVEL IN ENGINE OIL PAN, ADD OIL (PAGE 3-71)".



REPLACE FUEL FILTER CARTRIDGE

 **WARNING**

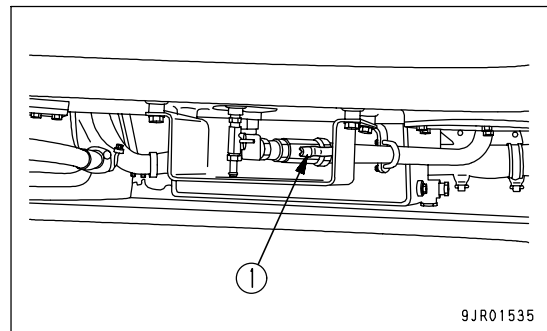
- Immediately after the engine is stopped, all parts are at high temperature, so do not replace the filter immediately. Wait for the engine to cool down before starting the operation.
- Do not bring any fire or spark close.

 **CAUTION**

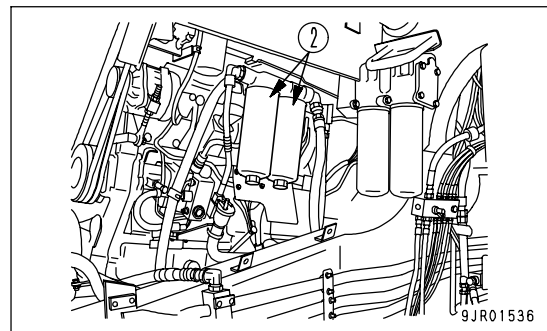
- This engine consists of higher precision parts than on the conventional fuel injection pump and nozzle, so if dirt gets in, it will cause problems. If there is any dirt stuck to the fuel line, use fuel to wash it off completely.
- Always use a Komatsu genuine part for the fuel filter cartridge. If filters other than genuine filters are used, problems may occur in the injection system, so never use substitute parts.

- Prepare a filter wrench

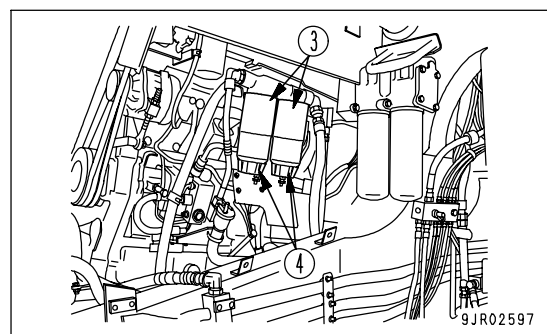
1. Close supply valve (1) of the fuel tank.
2. Set the container to catch the fuel under the filter cartridge.



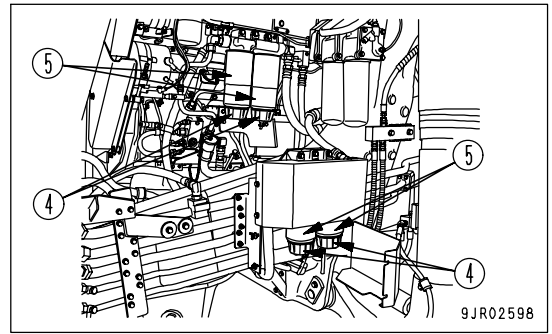
3. (Standard specification)
Using a filter wrench, turn 2 filter cartridges (2) to the left and remove them.



4. (Fuel filter with water separator specification)
Using a filter wrench, turn 2 filter cartridges (3) to the left and remove them.
Cap (4) at the bottom of the filter is used again. Remove it from the old filter cartridge and install it to the new filter cartridge.



5. (Additional fuel filter with water separator specification)
Using a filter wrench, turn 4 filter cartridges (5) to the left and remove them.
Cap (4) at the bottom of the filter is used again. Remove it from the old filter cartridge and install it to the new filter cartridge.
6. Clean the filter holder.



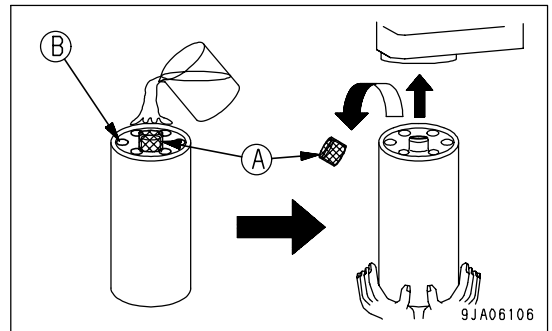
NOTICE

When filling the filter cartridge with fuel, carry out the filling operation with cap (A) fitted.

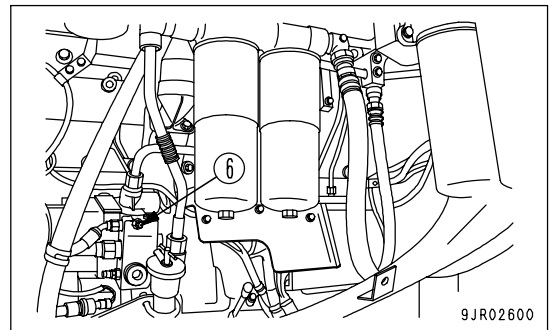
Cap (A) acts to prevent the entry of dirt or dust into the filter cartridge.

7. Fill the filter cartridge with clean fuel through the 8 small holes (B) in the new filter cartridge.
8. Coat the packing surface of the filter cartridge with oil.
9. Remove filter cartridge cap (A) and install to the filter holder.
10. When installing, bring the packing surface into contact with the seal surface of the filter holder, then tighten a further 1/2 - 3/4 turns by hand.

Always tighten the filter cartridge by the specified angle. If the filter cartridge is tightened too far, the packing will be damaged and this will lead to leakage of fuel. If it is not tightened enough, fuel will leak through the gap at the packing.



11. Open supply valve (1).
12. After replacing the filter cartridge, crank the engine with the starting motor and push air bleed valve (6) to bleed the air from the circuit. When the engine is started, the air is bled from the fuel circuit, so the cranking made take longer than usual. In addition, even after starting, there is still air in the fuel, so the engine rotation may be unstable at first. This does not indicate any problem. Run the engine at low idle until the engine rotation becomes stable.



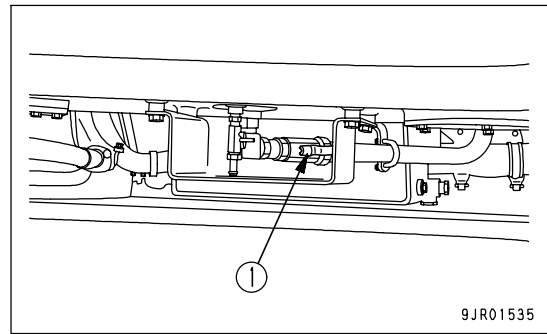
13. If the engine does not start when the above operation is carried out, do as follows to fill the fuel pump with fuel.
 - 1) Remove air bleed valve (6).
 - 2) Add oil until clean fuel overflows from the valve hole.
 - 3) Install air bleed valve (3).
Tightening torque: 12.7 N·m (1.3 kgf·m, 9.4 lbft)
 - 4) Crank the engine with the starting motor.
14. Check for any leakage from the filter seal. If any leakage is found, check the tightening of the filter cartridge. If there is still leakage, use the procedure in 2.3. to remove the filter cartridge, and if any embedded material or any damage is found in the packing surface, replace with a new cartridge and repeat the procedure in Steps 4 - 14.

REMARK

The air remaining in the fuel system will be exhausted while the engine is running.

CLEAN FUEL TANK STRAINER

1. Close supply valve (1) of the fuel tank.



2. Remove filter case (2).

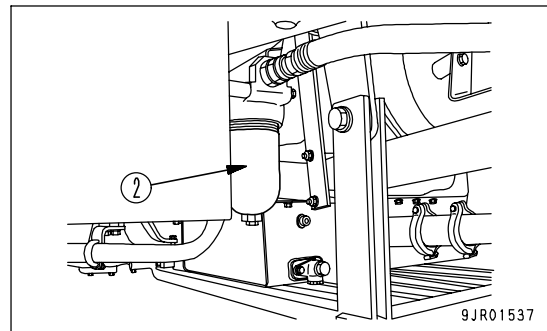
3. Take out the strainer, clean off dirt clung to it, and wash it in clean light oil or diesel oil.

If the strainer is damaged, replace it with a new one.

4. Install the strainer and filter case (2).

5. Open supply valve (1).

6. Bleed the air from the fuel circuit. For details, see "REPLACE FUEL FILTER CARTRIDGE (PAGE 4-52)".

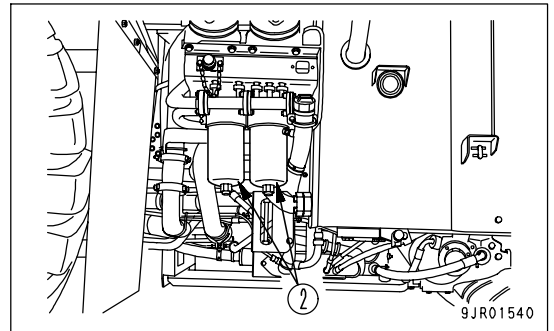


REPLACE TRANSMISSION OIL FILTER ELEMENT

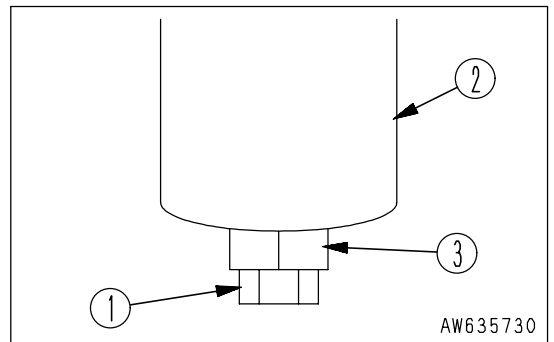
! WARNING

- The parts and oil are at high temperature after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

1. Set the container to catch the oil under the filter case.
2. Remove drain plug (1) at the bottom of the filter case, drain the oil, then tighten the plug again.
3. Loosen hexagonal portion (3) of case (2), then remove case (2).
4. Remove the element and clean the inside of the case.
5. Replace the filter gasket and O-ring with new parts. Coat the new gasket and O-ring thinly with clean oil before installing.
6. Assemble the new element, then set the case in position and install it.



Tightening torque for drain: 49 to 58.8 N·m
 (5 to 6 kgf·m, 36.2 to 43.4 lbft)
 Tightening torque for case: 58.8 to 78.5 N·m
 (6 to 8 kgf·m, 43.4 to 57.9 lbft)



7. Run the engine for a short time at idle, then stop the engine, and check that the oil is up to the specified level. For details, see "CHECK OIL LEVEL IN TRANSMISSION CASE, ADD OIL (PAGE 3-72)".

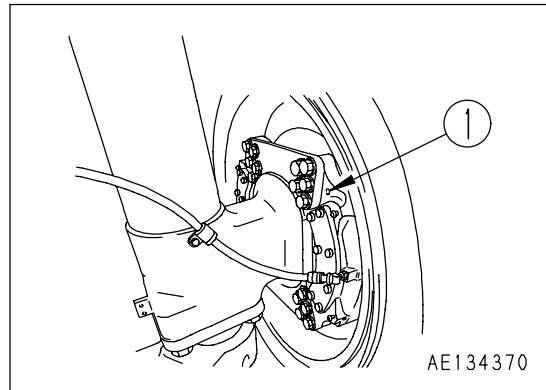
Run the engine at high idle, and when the oil is warmed up, if the Maintenance caution lamp flashes, replace the element immediately.

CHECK WEAR OF FRONT DISC BRAKE PADS

**WARNING**

- If the pad is continued to use after the period of wear limit, not only the disk will be damaged but also the brake will lose its effect, and it is dangerous. If the period of wear limit approaches, check frequently the condition to change the pad at proper time.
- Perform inspection every 250 hours if the work site is covered by lots of earth and sand and if it is at the location where the foot brake is frequently used.

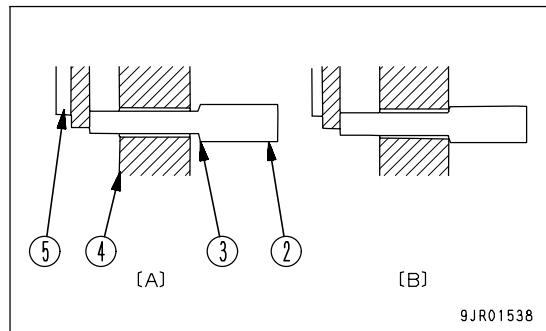
1. Insert the inspection gauge into the wear inspection hole (1) and check.



2. The wear limit where stepped portion (3) of gauge (2) contacts caliper (4) is 3 mm (0.1 in) (remaining thickness of pad), so replace pad (5).

(A): Near wear limit

(B): Wear limit reached, so replace pad



After the inspection, if it is necessary to change the pad, contact your Komatsu distributor.

Left and right wheels are not always the same in terms of the amount of wear of the pad. So, perform the inspection for both left and right. If either side shows the wear limit, be sure to change all 8 pads.

If the work is performed on the muddy and watery ground, the mud sticks to caliper or disc. Leaving the mud will increase the wear of pad, so wash out thoroughly with water.

CHECK FAN BELT FOR WEAR AND REPLACE

Inspect the V-belt and if it is in the following condition, replace the V-belt.

- The V-belt is in contact with the bottom of the groove of each pulley
- The V-belt is worn and has sunk below the outside diameter of the pulley
- The V-belt is cracked or peeling

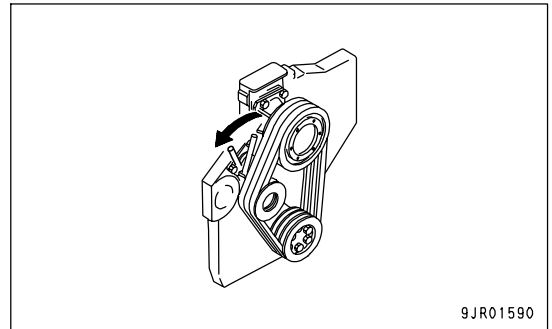
REPLACING

When replacing the V-belt, do as follows.

1. Replace the fan guard, then insert a bar of a length of approx. 50 cm (20 in) into the hole (Ø 18 mm (0.7 in)) in the tension pulley bracket, and pull forward strongly.
2. The spring is extended and the tension pulley moves inwards, so remove the old belt.
3. Install the new belt in the same way.

Replace the V-belts as a set.

The machine is equipped with an auto-tensioner, so there is no need to carry out any adjustment until the belt is replaced.



EVERY 1000 HOURS SERVICE

Carry out maintenance for EVERY 250 HOURS and EVERY 500 HOURS SERVICE at the same time.

REPLACE CORROSION RESISTOR CARTRIDGE



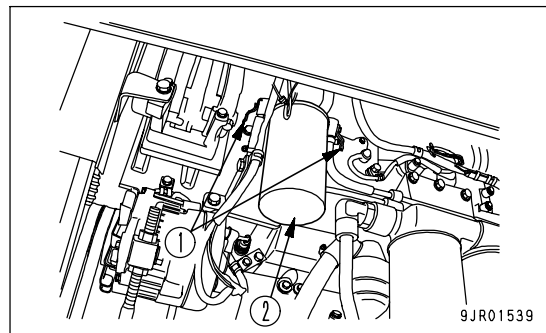
WARNING

All the engine parts are at high temperature after the engine has been operated, so never replace the cartridge immediately after finishing operations.

Wait for the oil to cool down before replacing the cartridge.

- Prepare a filter wrench

1. Screw in 2 valves (1) at the top of the corrosion resistor.
2. Set the container to catch the water under the cartridge.
3. Using a filter wrench, remove cartridge (2).
4. Clean the filter holder, coat the steel surface of the new filter cartridge with clean engine oil, then install it.
5. When installing, tighten until the gasket contacts the seal surface of the filter holder, then tighten a further 2/3 turns. If the filter cartridge is tightened too far, the gasket will be damaged and this will lead to leakage of water. If the filter is too loose, water will also leak from the gap at the gasket, so always tighten the correct amount.
6. Tighten 2 valves (1).
7. After replacing the cartridge, start the engine and check that there is no leakage of water from the filter seal surface. If there is any leakage of water, check the tightening of the filter cartridge.



CHANGE OIL IN TRANSMISSION CASE, CLEAN TRANSMISSION CASE STRAINER

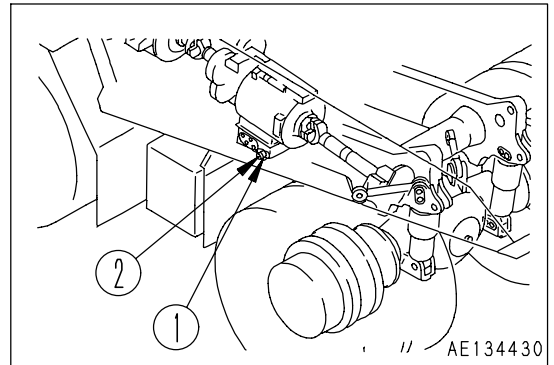
! WARNING

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

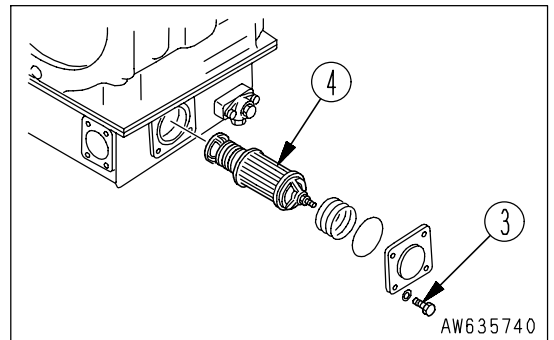
- Refill capacity: 190 liters (50.2 US gal)

Change the oil every 1000 hours or every 10,000 km, whichever comes sooner.

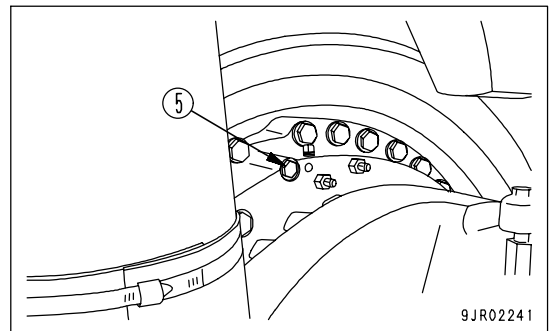
1. Set the container to catch the oil directly under the drain plug. Remove drain plug (1), then loosen drain valve (2) slowly to avoid getting oil on yourself, and drain the oil, then tighten the plug again.



2. Remove bolt (3), then remove the cover and take out strainer (4).
3. Remove any dirt stuck to the strainer, then wash in clean diesel fuel or flushing oil. If the strainer is damaged, replace it.
4. Install strainer (4).



5. Remove plug (5). If this plug is removed, it is easier to drain the oil from the brake chamber.

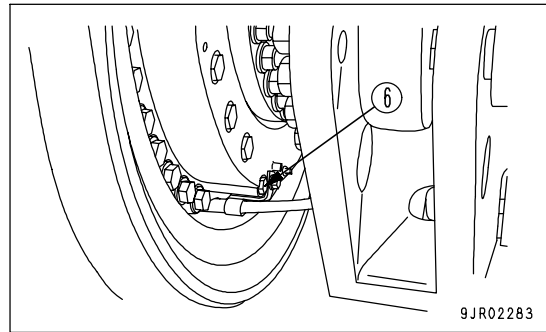


6. Remove retarder drain plug (6) and drain the oil from the brake chamber.

NOTICE

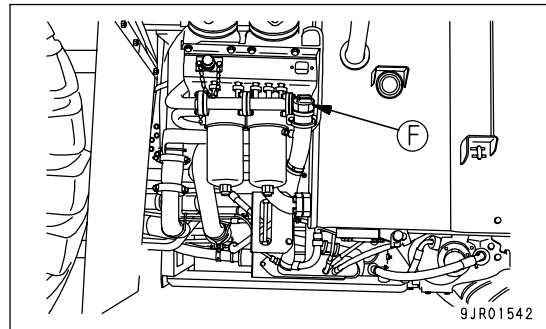
Drain the oil from the brake chamber on both the left and right sides.

7. After completely draining the oil from the brake chamber, install plug (5) and retarder drain plug (6).



8. Pour in the specified amount of engine oil from oil filler (F).

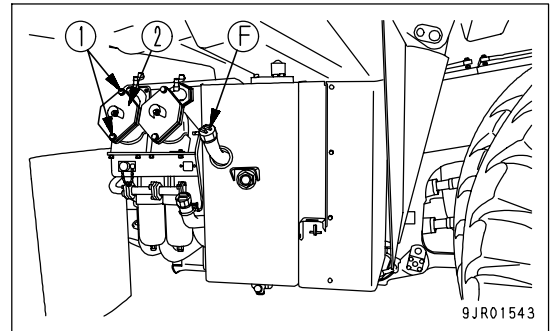
9. After adding oil, check that the oil is at the specified level. See "CHECK OIL LEVEL IN TRANSMISSION CASE, ADD OIL (PAGE 3-72)".



REPLACE TRANSMISSION AND REAR BRAKE COOLING OIL FILTER ELEMENT**WARNING**

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

1. Turn the cap of oil filler (F) slowly to release the internal pressure, then remove the cap.
2. Remove bolt (1), then remove cover (2).
3. Take out the element, then wash the inside of the case and the removed parts.
4. Install the new element, then install cover (2) with bolt (1).



If the filter Maintenance caution lamp (if equipped) lights up when the engine water temperature gauge is in the white range and the engine is running at 1200 to 2100 rpm, replace the element immediately.

REPLACE BRAKE OIL FILTER ELEMENT

**WARNING**

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

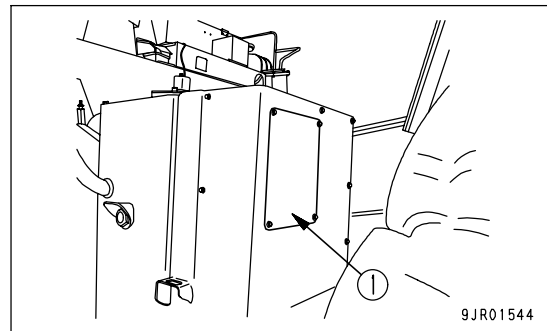
- Prepare a filter wrench

1. Depress the brake pedal at least 20 times to reduce the pressure inside the brake control accumulator to 0.

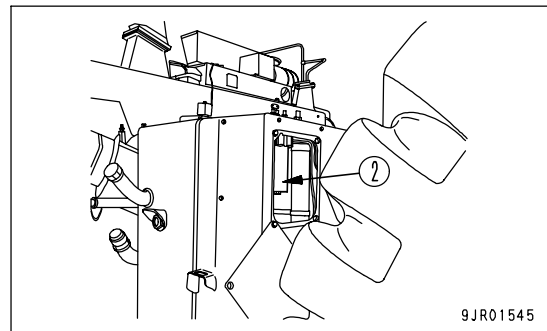
REMARK

When the pressure in the accumulator is released, the operating effort of the brake pedal becomes lighter and the oil pressure noise disappears.

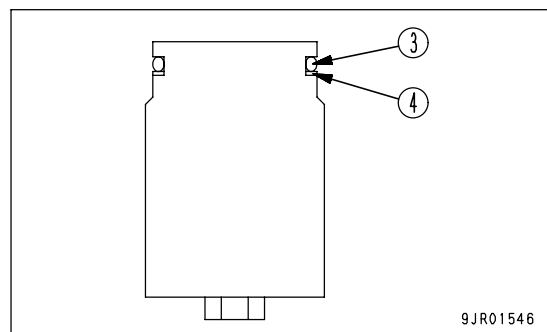
2. Remove the bolt, then remove accumulator cover (1), and put a container to catch the drain oil under the brake oil filter.



3. Remove filter case (2).



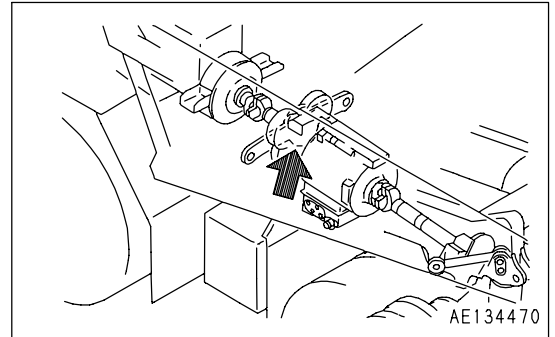
4. Take out the element and wash the inside of the filter case.
Replace O-ring (3) and backup ring (4) on the filter case with new parts, coat thinly with clean oil, then install.
5. Assemble a new element in the filter case, coat the O-ring of the element thinly with clean oil, then install.
Tightening torque: 78.4 to 98 N·m
(8 to 10 kgf·m, 57.9 to 72.3 lbf·ft)
6. Install accumulator cover (1).



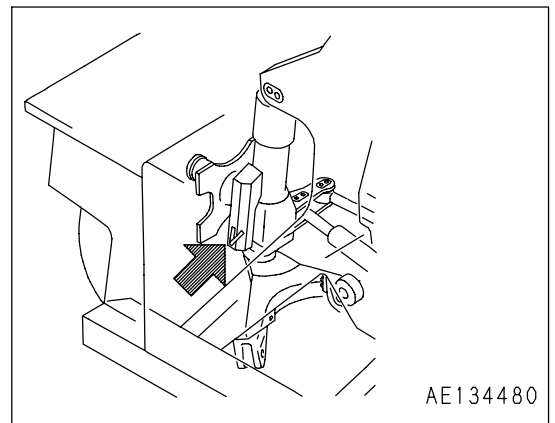
LUBRICATION

1. Using a grease pump, pump in grease through grease fittings marked by arrows.
2. After greasing, wipe off any old grease that was pushed out.

(1) Transmission mount (1 place)

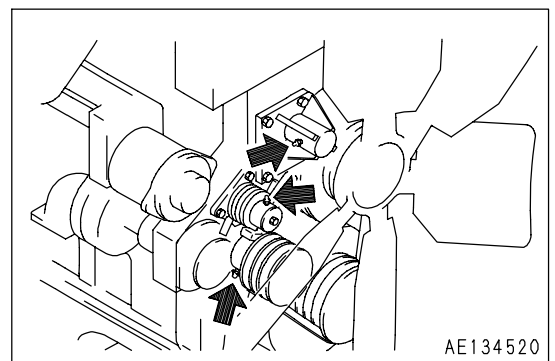


(2) Automatic suspension link (left and right: 1 place each)



(3) Tension pulley and fan pulley (3 places)

Pump in grease through the grease fitting until grease oozes out from the seal.

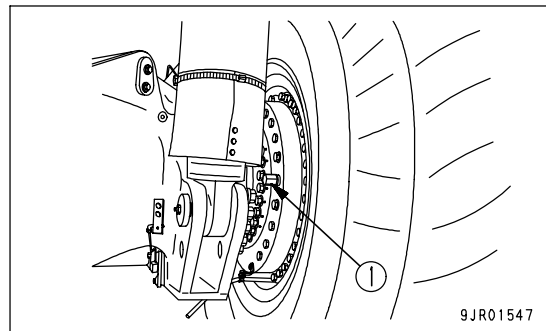


CHECK WEAR OF REAR BRAKE DISC

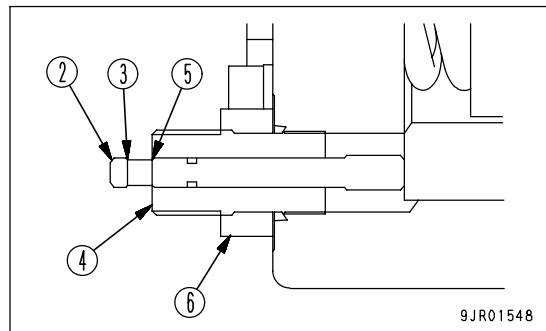
WARNING

- Carry out this check when the brake oil temperature is below 60°C (140°F).
- If the disc wear approaches the wear limit, check the condition frequently, regardless of the maintenance interval. In addition, check the retarder capacity carefully.
- Always carry out this operation with the engine stopped.

1. Stop the machine on level ground, set the parking brake switch to the PARKING position, then check that the other brakes are not applied before starting inspection.
2. Remove cap nut (1).



3. Push in until rod (2) of the gauge contacts the piston. Do not depress the brake pedal when doing this.
4. If slit (3) of rod (2) goes in beyond guide end face (4), it means that the disc has reached the wear limit.
If this happens, please contact your Komatsu distributor for inspection and maintenance.
5. Install cap nut (1) removed in Step 2.
Tightening torque: 128 to 186 N·m
(13 to 19 kgf·m, 94 to 137.4 lbft)



REMARK

- On a new machine, the position of the guide is adjusted so that slit (5) comes to guide end face (4), so do not loosen locknut (6) except when replacing the disc.
- When the engine is started and the rod is pushed in, the rod is pushed back by the brake cooling oil pressure, so carry out this operation with the engine stopped.

CHECK TIGHTENING PARTS OF TURBOCHARGER

Contact your Komatsu distributor to have the tightening portions checked.

CHECK PLAY OF TURBOCHARGER ROTOR

Contact your Komatsu distributor to have the rotor play checked.

EVERY 2000 HOURS SERVICE

Carry out maintenance for EVERY 250 HOURS, EVERY 500 HOURS and EVERY 1000 HOURS SERVICE at the same time.

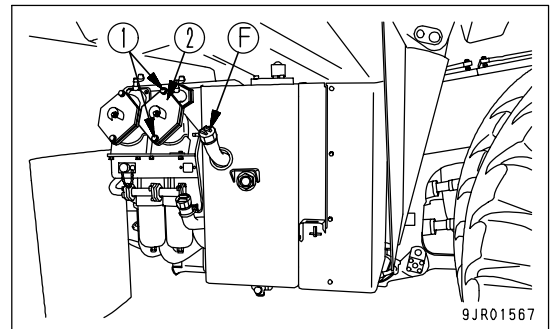
REPLACE STEERING, HOIST OIL TANK FILTER ELEMENT



WARNING

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

1. Turn the cap of oil filler (F) slowly to release the internal pressure, then remove the cap.
2. Remove bolt (1), then remove cover (2).
3. Take out the element, then wash the inside of the case and the removed parts.
4. Install the new element, then install cover (2) with bolt (1).



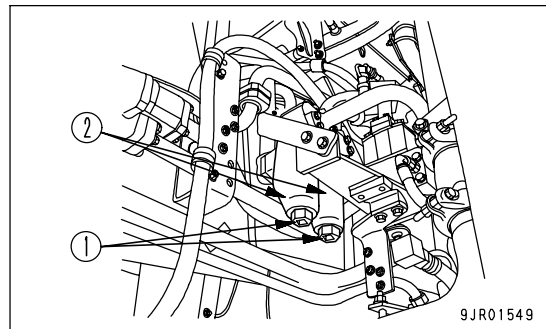
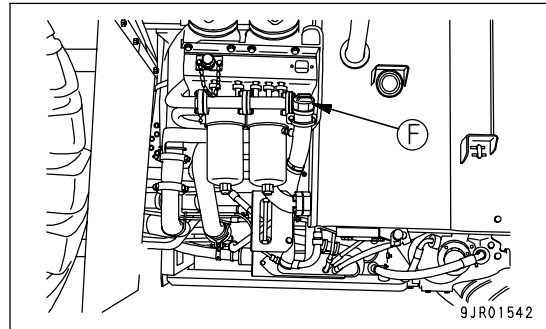
If the filter Maintenance caution lamp (if equipped) lights up when the engine water temperature gauge is in the white range and the engine is running at 1200 to 2100 rpm, replace the element immediately.

CLEAN HYDRAULIC TANK STRAINER

**WARNING**

- The parts and oil are at high temperature after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before starting the operation.
- If there is still pressure remaining inside the case, the oil or plug may fly out. Turn the plug slowly to release the pressure, then remove it carefully.

1. Lower the dump body and stop the engine.
2. Turn the cap of oil filler (F) slowly to release the internal pressure.
3. Remove plug (1) of the strainer (2 places) at the rear of the left front wheel.
4. Take the strainer out from strainer case (2), then wash it in clean diesel fuel.
5. Tighten the cap of oil filler (F).



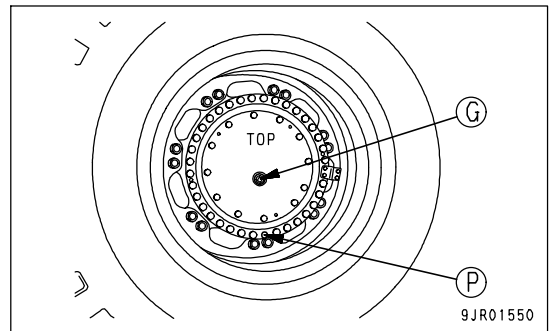
CHANGE OIL IN FINAL DRIVE CASE

! WARNING

- The parts and oil are at high temperature after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before starting the operation.
- If there is still pressure remaining inside the case, the oil or plug may fly out. Turn the plug slowly to release the pressure, then remove it carefully.

- Refill capacity: Left, right 21 liters (5.6 US gal) each

1. Stop the machine so that the TOP casting mark is at the top and drain plug (P) is at the bottom.
2. Remove drain plug (P), drain the oil, then tighten the plug again.
3. Add oil through the hole for plug (G) to the specified level.
4. After adding oil, check that the oil is at the specified level. See "CHECK OIL LEVEL IN FINAL DRIVE CASE, ADD OIL (PAGE 4-40)".



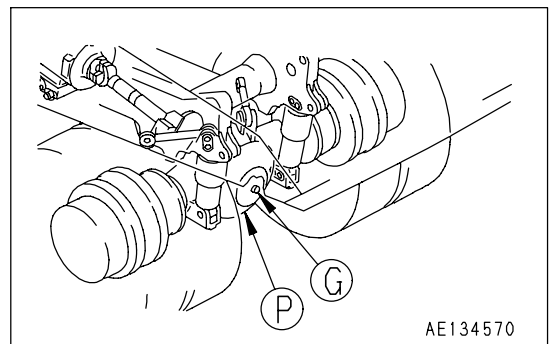
CHANGE OIL IN DIFFERENTIAL CASE

! WARNING

- The parts and oil are at high temperature after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before starting the operation.
- If there is still pressure remaining inside the case, the oil or plug may fly out. Turn the plug slowly to release the pressure, then remove it carefully.

- Refill capacity: 95 liters (25.1 US gal)

1. Remove drain plug (P), drain the oil, then tighten the plug again.
2. Add oil through the hole for plug (G) to the specified level.
3. After adding oil, check that the oil is at the specified level. See "CHECK OIL LEVEL IN DIFFERENTIAL CASE, ADD OIL (PAGE 4-40)".



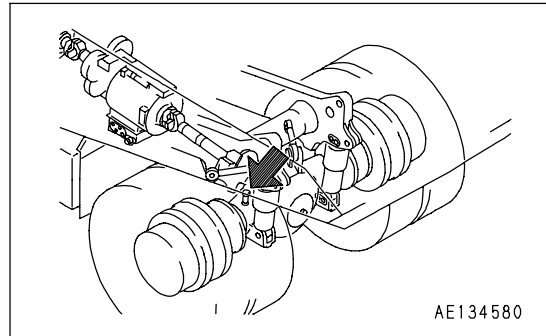
CLEAN DIFFERENTIAL CASE BREATHER



WARNING

- The parts and oil are at high temperature after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before cleaning the engine breather.
- When using compressed air, there is a hazard that dirt may be blown up and cause serious injury. Always use safety glasses, dust mask, or other protective equipment.

Remove the mud and dirt from around the breather, then remove the breather and wash out the dirt from inside with clean diesel oil or flushing oil.



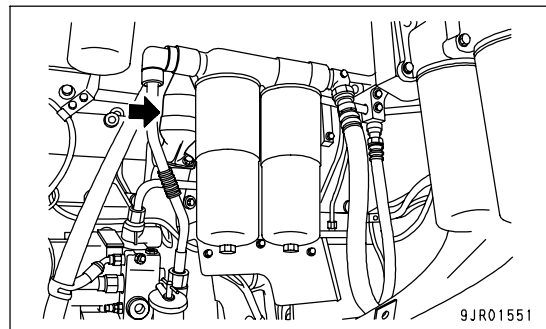
CLEAN ENGINE BREATHER ELEMENT



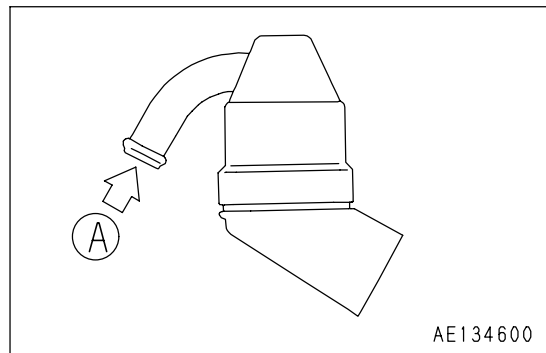
WARNING

- The parts and oil are at high temperature after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before cleaning the engine breather.
- When using compressed air, there is a hazard that dirt may be blown up and cause serious injury. Always use safety glasses, dust mask, or other protective equipment.

1. Wipe off the dirt from around the breather.
2. Remove the breather from the cylinder block.
3. Rinse the whole breather in diesel oil or flushing oil.



4. After washing, pass diesel oil through in direction (A).
5. Dry with compressed air, then coat the O-ring with oil, and install.
Check the element and O-ring, and replace them with new parts if necessary.



CHECK ALTERNATOR, STARTING MOTOR

The brush may be worn or have no grease on the bearing, so contact your Komatsu distributor for inspection or repair.

If the engine is started frequently, carry out inspection every 1000 hours.

CHECK, ADJUST ENGINE VALVE CLEARANCE

Special tools are needed for the inspection and maintenance, so please contact your Komatsu distributor to have this work carried out.

CLEAN, CHECK TURBOCHARGER

Contact your Komatsu distributor for cleaning and inspection.

CHECK ACCUMULATOR GAS PRESSURE

When carrying out the EVERY 2000 HOURS SERVICE or EVERY YEAR SERVICE or when making periodic replacement of the critical safety parts, please ask your Komatsu distributor to check the accumulator gas pressure.

EVERY 4000 HOURS SERVICE

Maintenance for every 250, 500, 1000, and 2000 hours should be performed at the same time.

CHANGE OIL IN STEERING, HOIST OIL TANK

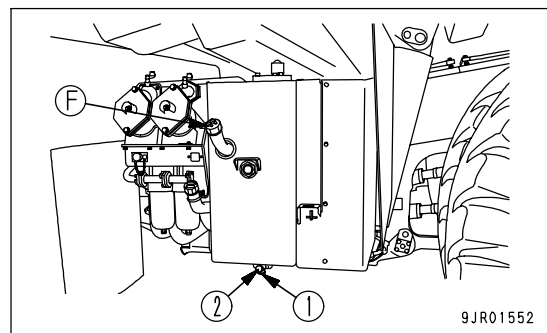


WARNING

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

- Refill capacity: 122 liters (32.2 US gal)

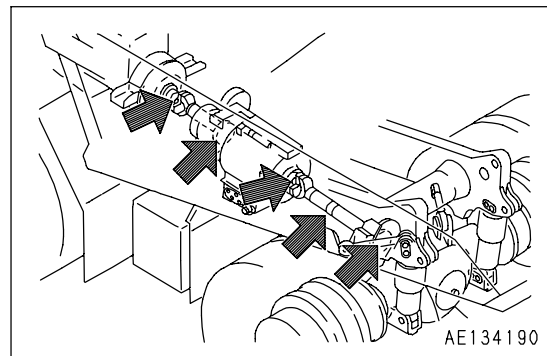
1. Lower the dump body and stop the engine.
2. Turn the cap of oil filler (F) to release the internal pressure before removing the cap.
3. Remove drain plug (1), then loosen drain plug (2) slowly to avoid getting oil on yourself, and drain the oil.
4. Pour in the specified amount of engine oil from oil filler (F).
5. After adding oil, check that the oil is at the specified level. See CHECK OIL LEVEL IN STEERING AND HOIST OIL TANK, ADD OIL (PAGE 3-72).



LUBRICATE DRIVE SHAFT

Carry out greasing every 4000 hours or every two years (whichever comes sooner).

1. Using a grease pump, pump in grease through the grease fittings marked by the arrows.
2. Grease the spider portion until grease comes out from the cap seal.
3. For the spline portion, continue greasing until grease comes out from the vent.
4. After greasing, wipe off any old grease that was pushed out.



CHECK WATER PUMP

Check for play in the pulley, leakage of grease or water, or clogging of the drain hole. If any problem is found, contact your Komatsu distributor for disassembly and repair or replacement.

CHECK FAN PULLEY AND TENSION PULLEY

Check for play of the pulley and leakage of grease. If any problem is found, please contact your Komatsu distributor.

CHECK VIBRATION DAMPER

There is the possibility of drop in the level of the damper fluid and runout of the concave surface. So, please contact your Komatsu distributor to inspect or replace.

EVERY 15000 HOURS SERVICE

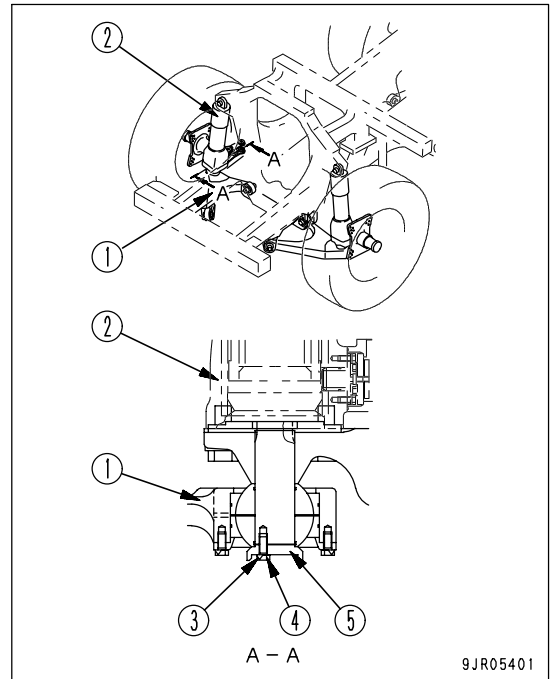
Maintenance for every 250, 500, 1000, 2000, and 4000 hours of service should be performed at the same time.

CHECK, REPLACE STEERING A ARM MOUNTING BOLT

Check and replace the A arm mounting bolts, lock plate, and holder.

Please consult your Komatsu distributor when checking and replacing.

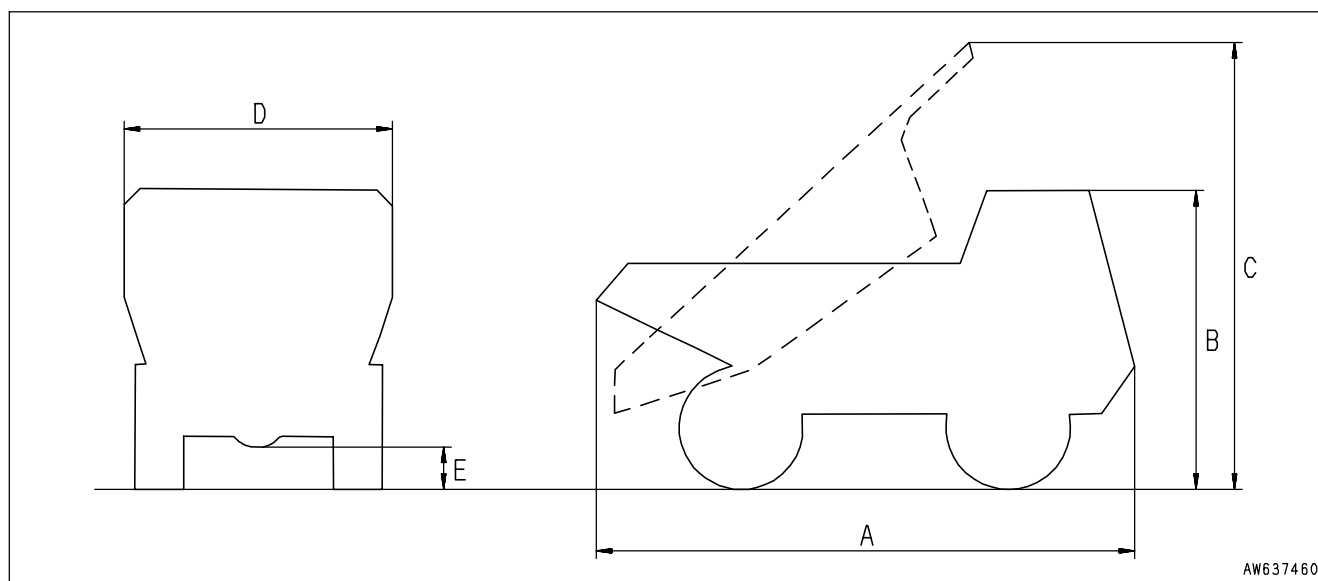
- (1) A arm
- (2) Front suspension
- (3) Lock plate
- (4) Bolt
- (5) Holder



SPECIFICATIONS

SPECIFICATIONS

Item		Unit	HD465-7	HD605-7
Overall weight (unladen weight + max. payload + 1 operator (75kg (165 lb)))		kg (lb)	97875 (215841)	108975 (240290)
Unladen weight		kg (lb)	42800 (94374)	45900 (101210)
Unladen weight (Without body)		kg (lb)	32100 (70781)	32500 (71663)
Max. payload		kg (lb)	55000 (121275)	63000 (138915)
Dump body capacity	Struck	m ³ (cu.yd)	25 (32.7)	29 (37.9)
	Heaped (2 : 1)	m ³ (cu.yd)	34.2 (44.7)	40 (52.3)
Dumping speed (at 2000 rpm) (raised)		sec	11.5	
Engine type		-	Komatsu SAA6D170E-3 diesel engine	
Flywheel horsepower of engine		kW (HP)/rpm	551 (739)/2000	
Max. torque		N·m (kgf·m, lbf·ft)/rpm	3260 (332, 2401)/1400	
A	Overall length	mm (ft in)	9355 (30' 8")	
B	Overall height	mm (ft in)	4400 (14' 5")	
C	Overall height at dumping	mm (ft in)	8800 (28' 10")	
D	Overall width	mm (ft in)	4595 (15' 1")	
E	Min. ground clearance (bottom of rear axle)	mm (ft in)	645 (2' 1")	
Min. turning radius		mm (ft in)	8500 (27' 11")	
Travel speed	Forward	1st	km/h (MPH)	11.5 (7.1)
		2nd	km/h (MPH)	16.0 (9.9)
		3rd	km/h (MPH)	21.5 (13.4)
		4th	km/h (MPH)	29.5 (18.3)
		5th	km/h (MPH)	39.0 (24.2)
		6th	km/h (MPH)	52.5 (32.6)
		7th	km/h (MPH)	70.0 (43.5)
	Reverse	1st	km/h (MPH)	12.0 (7.5)



ATTACHMENTS, OPTIONS

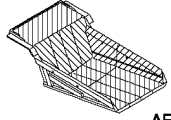
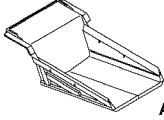
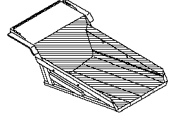
 **WARNING**

Please read and make sure that you understand the SAFETY section before reading this section.

SELECTING DUMP BODY

(Set for HD465-7 only)

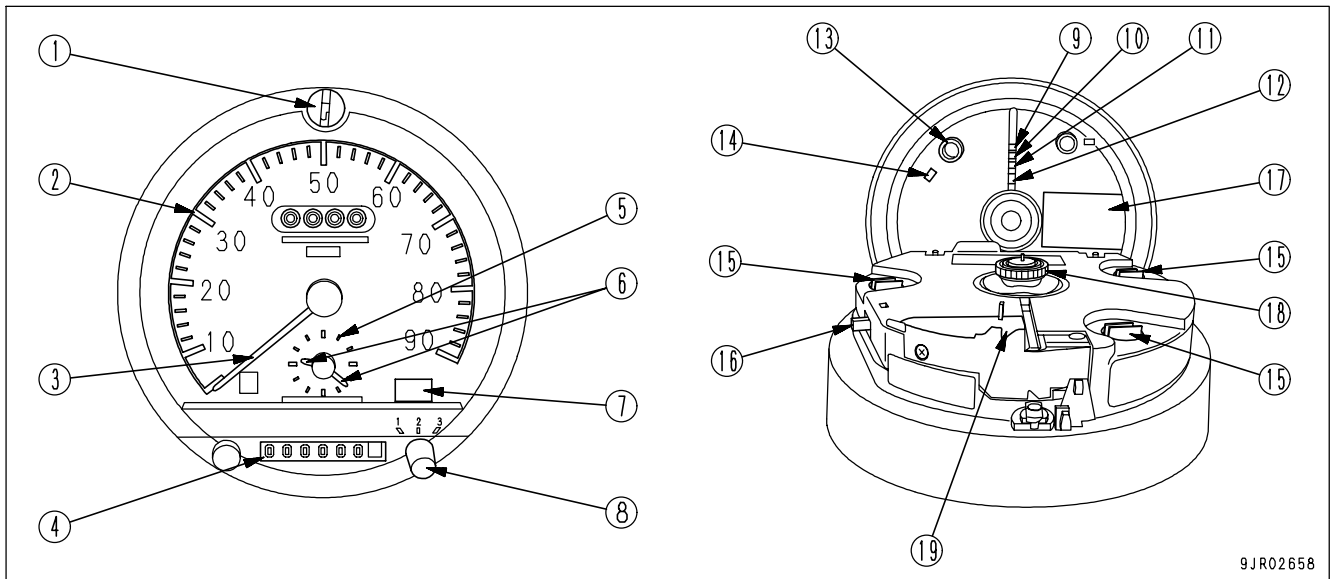
Select the dump body from the following table.

Purpose	Body type	Features	Body shape
Transporting rocks	Rock body	<ul style="list-style-type: none"> A liner is installed to the whole inside surface of the dump body to allow the loading of crushed rock, coal, or timber. Example: Coal mine 	 ※ AE134880
Transporting soil or sand	Linerless body	<ul style="list-style-type: none"> This is suitable for jobsites where soil or sand is loaded. No liner is installed. Example: Loading loose soil for landfills 	 ※ AE134890
(Special specification) Transporting rubble	Rubber liner body	<ul style="list-style-type: none"> This is suitable for jobsites where rubble or large rocks are loaded. A rubber liner is installed. This is also effective in reducing noise when loading. Example: Jobsites handling rubble 	 ※ AE134900

※: It is possible to install a side extension (if equipped) to these dump bodies.

HANDLING TACHOGRAPH (TCO20-90W)

EXPLANATION OF COMPONENTS



- | | |
|--|--|
| (1) Keyhole | (11) Spare recording indicator |
| (2) Speed scale | (12) Odometer recording indicator |
| (3) Speed indicator | (13) Speed warning setup adjustment screw |
| (4) Odometer | (14) Speed warning setup confirmation window |
| (5) Clock scale | (15) Panel lighting lamps (x 3) |
| (6) Clock needle | (16) Time adjustment switch |
| (7) Model display label | (17) Nameplate |
| (8) Operator shift change knob | (18) Crimped ring |
| (9) Speed recording indicator | (19) Cutter |
| (10) Operator shift change recording indicator | |

KEYHOLE

This keyhole (1) is used when opening and closing the cover to replace the chart paper.

SPEED SCALE

This scale (2) is the scale for the machine speedometer.

SPEED INDICATOR

This indicator (3) shows the machine travel speed.

ODOMETER

This meter (4) shows the total distance that the machine has traveled (km). (The distance traveled in reverse is also added.)

The minimum display unit is 0.1 km.

CLOCK SCALE

This scale (5) is the scale for the clock.

CLOCK HAND

These needles (6) point to the time.

MODEL DISPLAY LABEL

The model of the tachograph is input on label (7).

OPERATOR SHIFT CHANGE KNOB

Knob (8) can be used to give independent data for 3 operators.

Align the scale on the knob with the setting scale (1, 2, 3).

SPEED RECORDING INDICATOR

Item (9) records the momentary speed of the machine on the chart paper.

OPERATOR SHIFT CHANGE RECORDING INDICATOR

This needle (10) records the data by filling in three types of width on the chart paper according to the operation of the operator shift change knob.

SPARE RECORDING INDICATOR

This needle (11) records the desired data (for example: amount loaded, amount unloaded) according to the switch (separately purchased) installed on the outside.

ODOMETER RECORDING INDICATOR

This needle (12) records the distance traveled by the machine on the chart paper. One mark indicates 10 km.

SPEED WARNING SETUP ADJUSTMENT SCREW

This screw (13) can be used to set the speed for lighting up the speed warning lamp.

Use a flat-headed screwdriver to turn and make the setting.

Setting range: 40 to 90 km/h (24.9 to 55.9 MPH)

SPEED WARNING SETUP CONFIRMATION WINDOW

Window (14) is used to confirm the speed sensor when turning the speed warning setting adjustment screw.

PANEL LIGHTING LAMPS

This lamp (15) is the illumination for the meters and gauges. (There are 3 lamps.)

TIME ADJUSTMENT SWITCH

This switch (16) is used to set the time.

NAMEPLATE

The model, serial No., date of manufacture, manufacturing No., product No., etc. are given on nameplate (17).

CRIMPED RING

Ring (18) is used to secure the chart paper to the tachograph.

CUTTER

Cutter (19) is used to cut the tape connecting the chart paper.

METHOD OF USE

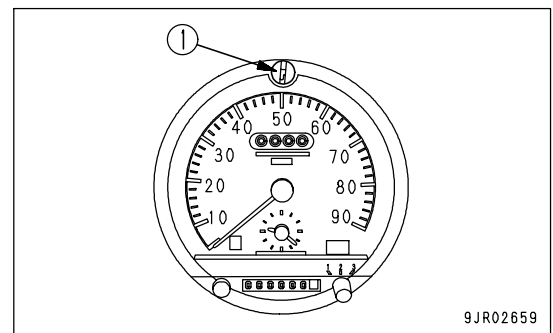
OPENING AND CLOSING COVER

NOTICE

- When closing the cover, align the cover and the case exactly, then apply the lock. If the cover is not closed securely, the speed indicator will not work properly.
- When opening the cover, do not use any excessive force on the cover. This will cause breakage of the cover support.
- When opening or closing the tachograph, use the key to open or close carefully.
- Always turn the key fully to the left when closing the cover. Do not close the cover if the key is in any other position. This will cause damage to the case or lock.

METHOD OF OPENING COVER

1. Insert the key in the keyhole (1).
2. Turn the key fully to the left, then pull lightly. The cover will open.



METHOD OF CLOSING COVER

1. Turn the key fully to the left, and use the key to close the cover carefully.
Check that the cover and case are correctly aligned.

REMARK

When the cover is closed, it will feel heavy, but this is not a problem.

2. Turn that the key fully to the right, then remove it. The cover will close.

SETTING TIME

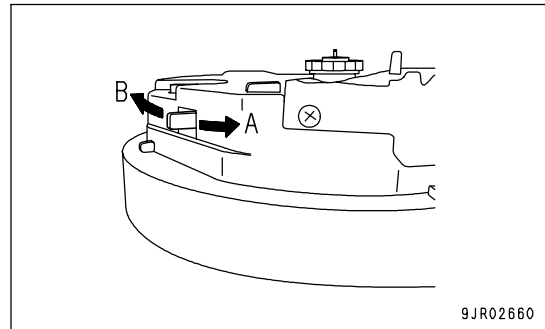
NOTICE

- When adjusting the time, always turn so that the needle moves clockwise when setting. If the clock is fast, turn the needle back about 10 minutes, then move it forward to set the time. If this is not done, the time will not be set properly.
- Start the engine before adjusting the time.

1. Open up the tank cover.
2. Press the time adjusting switch to adjust the time.

REMARK

- When the time adjusting switch is pressed to the (A) position, the needle will advance; when it is pressed to the (B) position, the needle will move back.
- When the switch is pressed to the (A) position or (B) position, the indicator will move slowly for approx. 3 seconds, and then will move at high speed.



3. After setting the time, close the cover.

REPLACING CHART PAPER

**CAUTION**

When replacing the chart paper, do not touch the edge of the cutter. There is a protective cover, but there is still danger of cutting your finger by mistake.

NOTICE

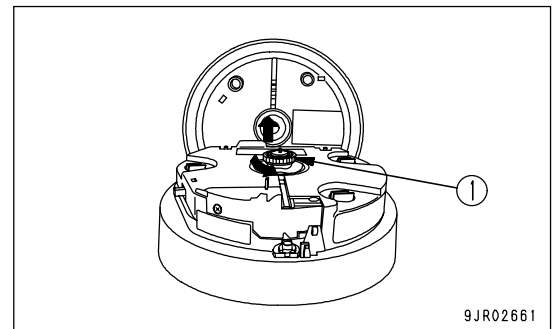
- Always use Komatsu genuine chart paper. If any other chart paper is used, it may cause failure of the tachograph.
- When adjusting the time on the chart paper between 22:40 and 24:00, always set the cutter at the bottom of the first sheet of chart paper. If it is set wrongly, the speed indicator will catch and cause failure.
- Always start with the top sheet when using the chart paper. Do not cut the connecting tape to separate the chart paper and use one sheet at a time. This will cause the paper to catch and this will result in failure of the clock.
- Always remove and install the crimped ring by hand.

Always use Komatsu genuine chart paper (YZ762928-260).

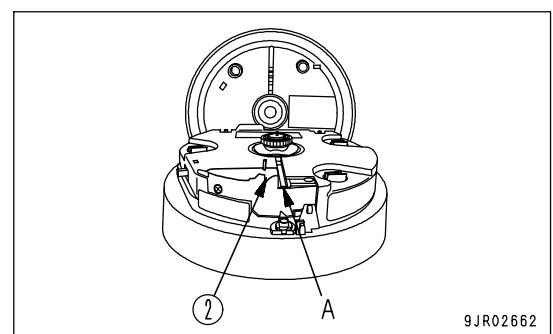
Adjust the time before replacing the chart paper. If the time is adjusted after the chart paper is set in position, there will be a difference between the correct time and the set time for the chart paper.

Be careful not to bend the chart paper, damage the surface, or get water on the paper. It will become impossible to obtain a correct record.

1. Open up the tank cover.
2. Turn crimped ring (1) to the left, then move it up to remove it.
3. Always use a ballpoint pen to write the employee code, machine code, date, etc. on the new chart paper.

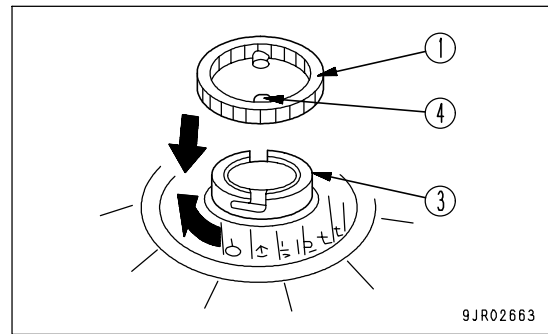


4. Insert the outside portion of the chart paper under cutter (2). Align with chart paper mount (3) of the tachograph and install the chart paper.
5. Turn the chart paper and align the present time position on the time scale on the chart paper with the time set mark (A) (red) on the tachograph.



6. Set projecting portion (4) of the crimped ring at the bottom, and align with the groove of chart paper mount (3).
Pressed crimped ring (1) down with your finger and turn it to the right to install it.

7. Close the cover.



STORING CHART PAPER

Keep the chart paper in a place where there is no direct sunlight, where no water can get on the paper, and where there is no high humidity. Select a place where there is good ventilation and low humidity.

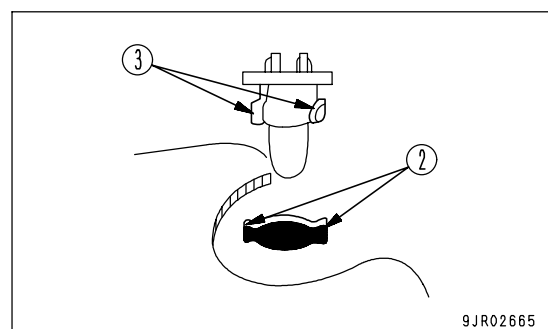
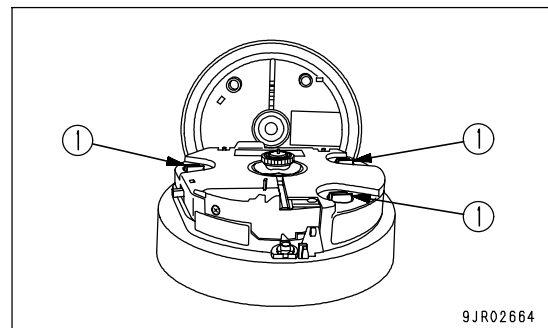
REPLACING LAMP

NOTICE

The tachograph illumination lamp is 24V. Never use a lamp of the wrong rating.
If the wrong lamp is used, the heat from the lamp will cause failure of the tachograph.

Part name	Color of socket	Rating
24V lamp	Dark brown	24V 1.4W

1. Open up the tank cover.
2. Insert a coin in the groove of lamp socket (1) and turn it to the left.
3. Remove lamp socket (1).
4. Align projecting portion (3) of the lamp socket with groove (2) of the tachograph lamp mount, then insert the lamp bulb.
5. Use a coin to turn lamp socket (1) to the right and secure the lamp socket in position.
6. Close the cover.



HANDLING AIR SUSPENSION SEAT

SEAT ADJUSTMENT

WARNING

- Park the machine in a safe place and stop the engine when carrying out adjustment of the operator's seat.
- Adjust the seat before starting operations or when changing operators.
- Adjust the position of the operator's seat so that you can depress the brake pedal fully with your back against the seat backrest.

Adjustments (E), (J), and (K) use the air compressor built into the seat, so turn the engine starting switch to the ON position when carrying out the adjustment.

(A) Fore-and-aft adjustment

Pull lever (1) up, set the seat to the desired position, then release the lever.

Amount of adjustment: 180 mm (7.1 in)
(10 mm (0.4 in) x 18 stages)

(B) Adjusting seat angle

Move lever (2) up and apply your weight to the rear of the seat. The seat will tilt to the rear.

Move lever (3) up and apply your weight to the front of the seat. The seat will tilt to the front.

Amount of adjustment: 24 degrees (front and rear tilt: 3 stages each)

(C) Adjusting height of seat

Move levers (2) and (3) up and move the seat up or down to the desired position.

These levers are also used for adjusting the seat angle, so adjust the seat angle to set the seat to the desired height.

Amount of adjustment: 65 mm (2.6 in)

(D) Adjusting fore-and-aft position of seat cushion

Push in lever (4), set the seat cushion to the desired position, then release the lever.

Amount of adjustment: 60 mm (2.4 in)

(E) Setting seat for weight

Sit on the seat, raise your body slightly, then operate switch (5) to adjust the strength of the suspension.

Amount of adjustment: 50 - 130 kg (110 - 287 lb)(target)

When + is pressed: Suspension becomes stronger

When - is pressed: Suspension becomes weaker

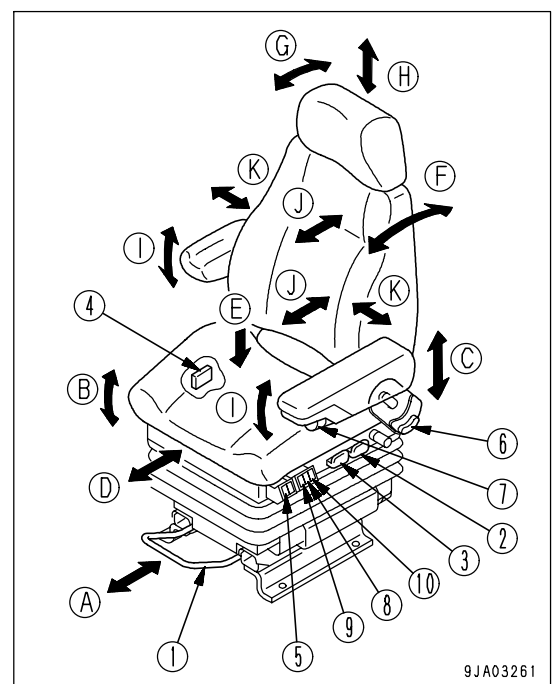
(F) Adjusting reclining angle

Move lever (6) up and move the backrest to the front or rear.

Push your back against the backrest when carrying out this adjustment. If your back is not pressing against the backrest, the backrest may suddenly spring forward.

Amount of adjustment: Front tilt: Free

Rear tilt: 40 degrees (2 degrees x 20 stages)



9JA03261

(G) Adjusting headrest angle

Rotate the headrest to the front or rear.

Amount of adjustment:

Front tilt: 13 degrees

Rear tilt: 13 degrees

(H) Adjusting headrest height

Move the headrest up or down.

Amount of adjustment: 80 mm (3.2 in)

(I) Adjusting armrest angle

Rotate the knob (7) and adjust the angle of the armrest. (Left side only)

Amount of adjustment: 73 degrees (front: 54 degrees; rear: 19 degrees)

If the arm rest is turned, it will spring up. (Both left and right sides)

(J) Lumbar support

Operate switch (8) to give a suitable tension to the lower lumbar region.

Operate switch (9) to give a suitable tension to the upper lumbar region.

When + is pressed: Tension becomes stronger

When - is pressed: Tension becomes weaker

(K) Side support

Operate switch (10) to give a suitable tension to the left and right lumbar region.

When + is pressed: Tension becomes stronger

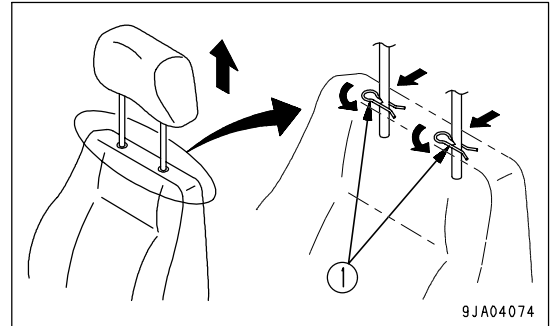
When - is pressed: Tension becomes weaker

REMOVAL AND INSTALLATION OF HEADREST

REMOVAL

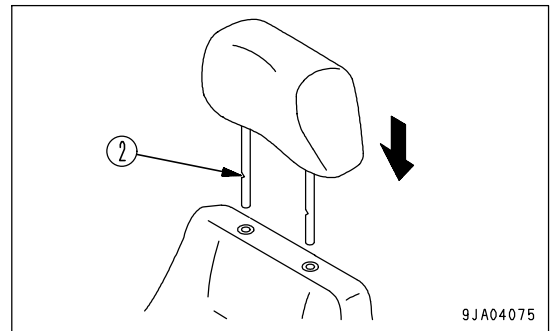
If the headrest is not needed, remove it as follows.

1. Pull up the headrest to the position where it stops.
2. From the top of the seat back, turn stopper (1) (under the material at the top of the seat) of the headrest bar on one side in the direction of the arrow, and pull up the headrest.
When stopper (1) is turned, it will come out of groove (2).
3. Turn stopper (1) on the other side in the direction of the arrow, and pull up the headrest.
When both stoppers (1) come out of groove (2), the headrest can be removed.



INSTALLATION

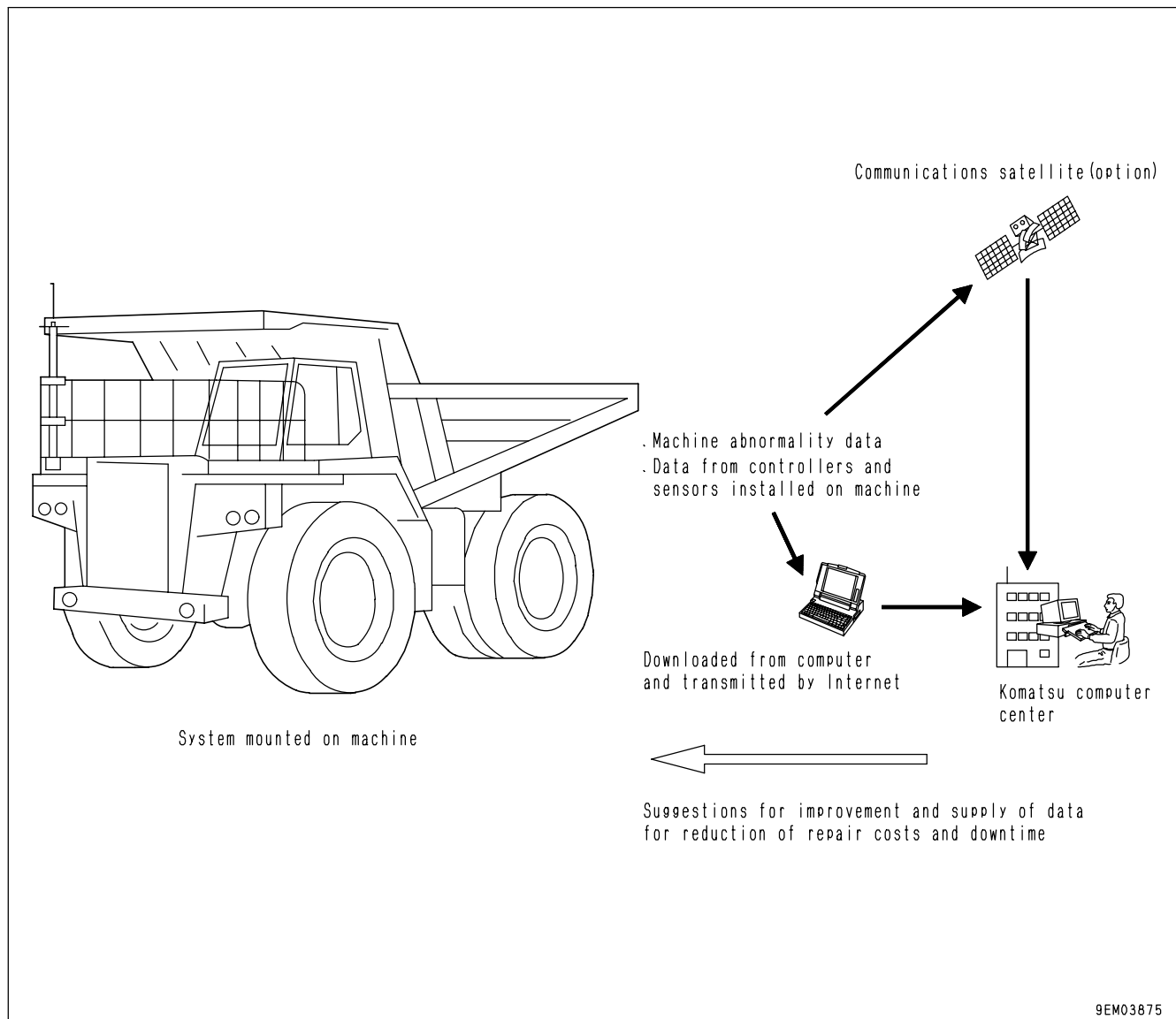
1. Insert the bars into the holes in the top of the seat and push down.



HANDLING VEHICLE HEALTH MONITORING SYSTEM (VHMS)

OUTLINE OF SYSTEM

- This system uses the VHMS controller to gather data about the operation of the machine sent from the controllers and sensors installed to the machine.
- The data stored in the VHMS controller is sent by personal computer or by communications satellite and is compiled in the Komatsu computer server. (The system using the communications satellite is a separate option)
- Based on this information, your Komatsu distributor will suggest improvements and provide you with information aimed at reducing machine repair costs and downtime.



9EM03875

BASIC PRECAUTIONS

HANDLING MACHINE, SAFETY, INSPECTION AND MAINTENANCE

For details of safety items, handling and operating the machine, inspection and maintenance, see "SAFETY (PAGE 2-1)", "OPERATION (PAGE 3-1)", "MAINTENANCE (PAGE 4-1)".

- When using this machine, there is no particular need to operate this system.
- A pole and antenna are installed, so the overall height of the machine increases by 410 mm (16.2 in). The careful when operating in places where there are height limits. (When a 300 mm (11.8 in) spill guard is installed, the overall height increases by 260 mm (10.2 in).)

HANDLING VEHICLE HEALTH MONITORING SYSTEM

Always obey the following when handling this system.

- Never disassemble, repair, or modify the machine or system. This may cause failure or fire on the machine or this system.
- Do not touch the system when operating the machine.
- Do not pull by force or get the wiring harnesses, connectors, or sensors of this system caught. This may cause short circuits or disconnections that lead to failure or fire on the machine or this system.
- Do not get water, dirt, or oil on the system.
(When handling this system, please contact your Komatsu distributor.)

CHECK BEFORE STARTING

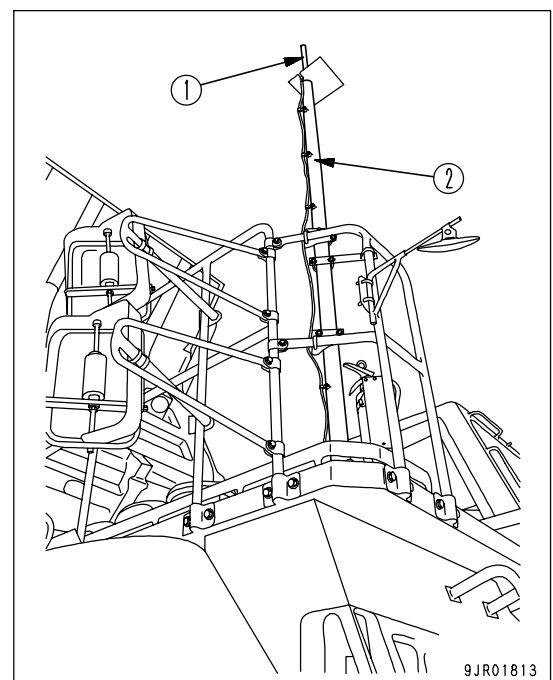
When using this machine, there is no particular need to operate this system, but be sure to carry out daily inspection in order to maintain the function and performance of the system. If there is any problem, please consult your Komatsu distributor.

1. Check for loose, damaged, or dirty mounts of the sensors or antenna.
2. Check for disconnected or damaged wiring harnesses, cables, or connectors.
3. Check for oil or gas leaks from the sensor mounts.

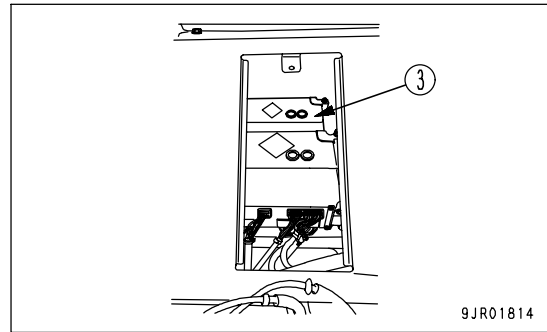
Inspect the following places.

Communication antenna (1) (if equipped)

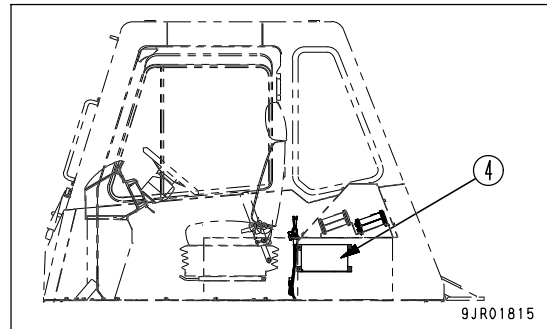
Antenna pole (2) (if equipped)



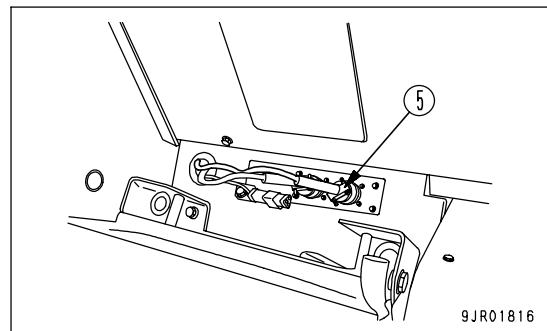
VHMS controller (3)



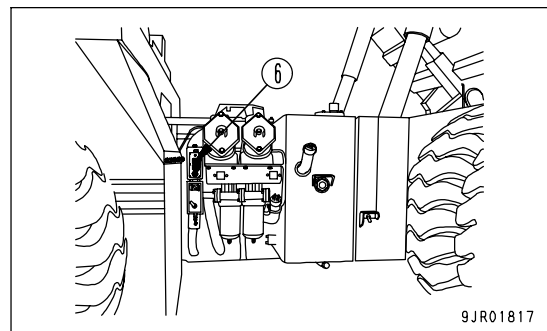
Orbcomm controller (4) (if equipped)



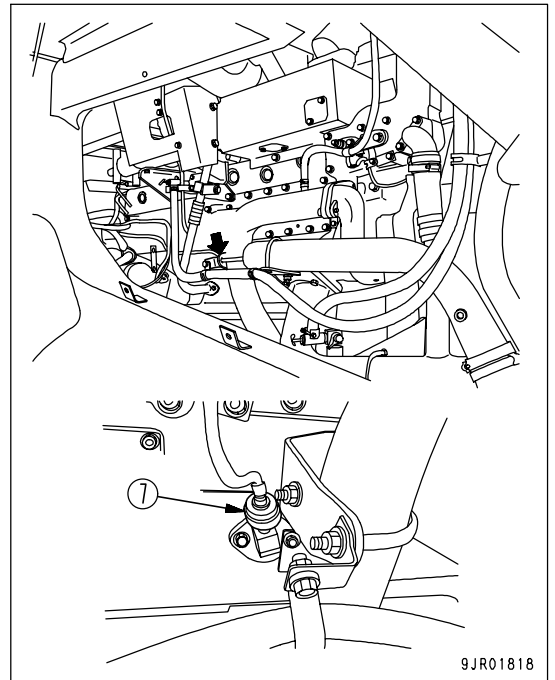
Download connector (5)
This is behind the assistant's seat.



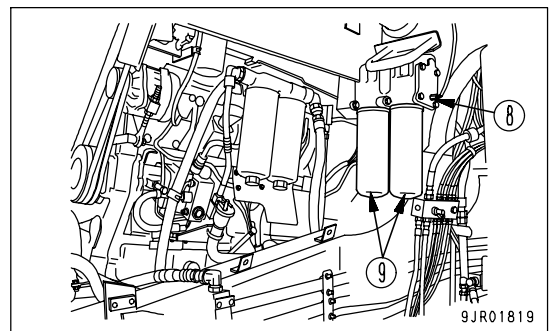
Ground level download box (6)



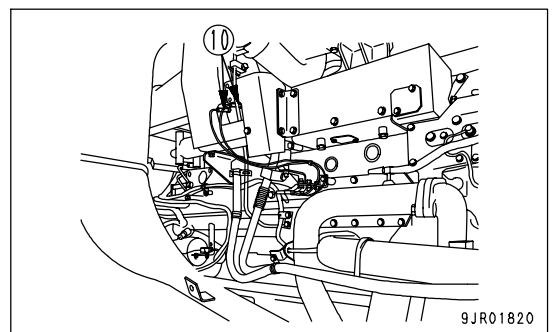
Blow-by sensor (7)



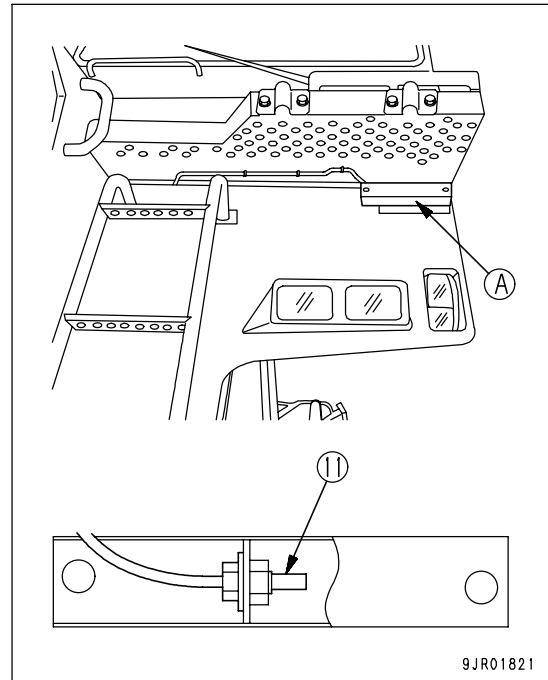
Engine oil temperature sensor (8)
Engine oil filter (9)



Exhaust temperature sensor (10)



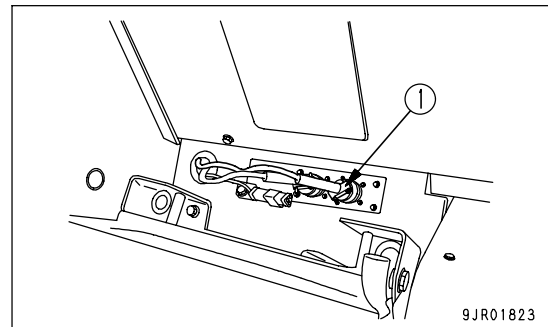
Ambient temperature sensor (11)
 Ambient temperature sensor (11) is inside box (A).
 Remove box (A) when carrying out inspection.



PROCEDURE WHEN DOWNLOADING

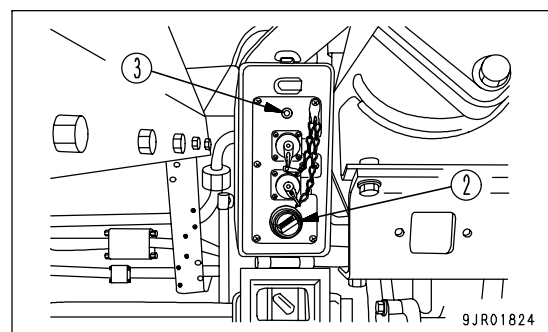
When downloading from connector inside cab (behind assistant's seat)

- Turn the starting switch to the ON position to download.
- Remove the download connector (1) before downloading.



When downloading from ground level download box outside cab

- Turn the starting switch to the OFF position to download.
- Use the starting switch to open or close the box.
- Set switch (2) inside the box to the ON position. When display lamp (3) lights up, the system is ready to download.
- After completion of downloading, return switch (2) to the OFF position.



OTHER PRECAUTIONS

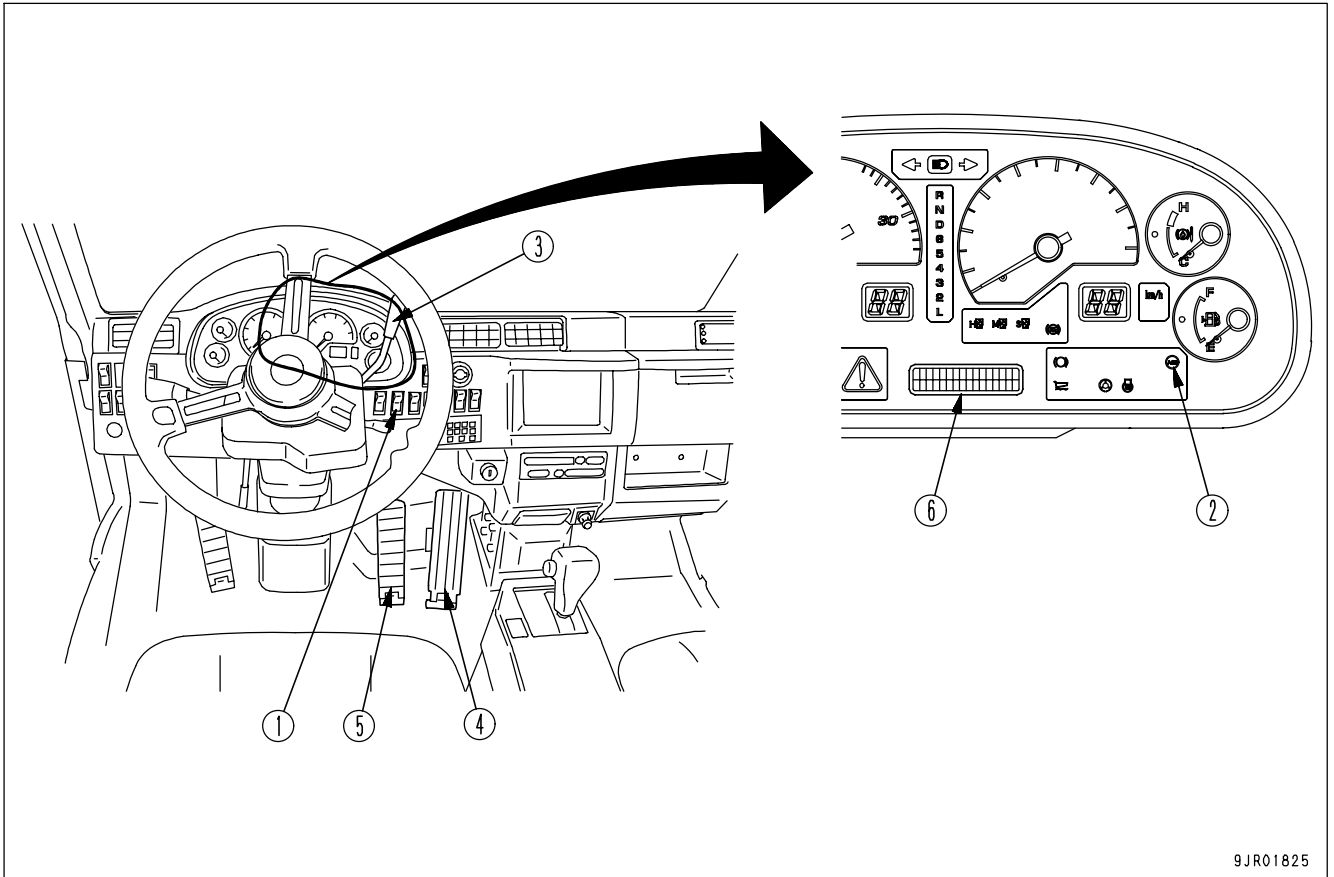
In the following cases, please consult your Komatsu distributor.

- When selling or giving away the machine
- When disposing of the machine
- When replacing the engine or transmission

HANDLING AUTOMATIC SPIN REGULATOR (ASR)

ASR is a function to prevent slipping of the drive wheels caused by excessive torque. Accordingly, the machine can start and travel normally even on a bad or frozen road surface.

EXPLANATION OF COMPONENTS



9JR01825

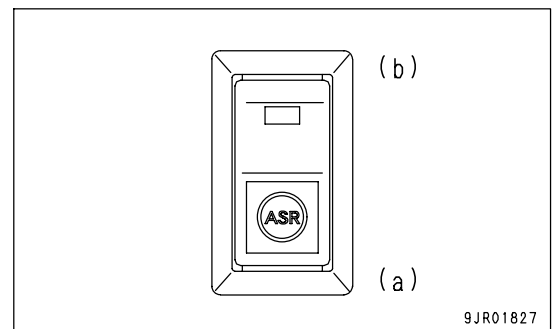
- | | |
|----------------------------|-----------------------|
| (1) ASR switch | (4) Accelerator pedal |
| (2) ASR actuation lamp | (5) Brake pedal |
| (3) Retarder control lever | (6) Character display |

ASR SWITCH

This switch (1) turn to the ASR system ON/OFF.

(a): ASR system OFF

(b): ASR system ON



9JR01827

ASR ACTUATION LAMP

When the ASR switch is ON, this lamp (2) lights up if the system detects slipping from the rear wheels and actuates the ASR.

RETARDER CONTROL LEVER

When the ASR is actuated and this lever (3) is used to actuate the retarder, the actuation of the ASR system is canceled.

ACCELERATOR PEDAL

The ASR system is actuated only when this pedal (4) is being depressed and the travel speed is 0 to 30 km/h (0 to 18.6 MPH). If the pedal is released while the ASR is being actuated, the actuation of the ASR system is canceled.

BRAKE PEDAL

If this pedal (5) is depressed while the ASR is being actuated, the actuation of the ASR system is canceled.

CHARACTER DISPLAY

If any problem occurs in the ASR system, an action code is shown on this display (6).

ACTUATION OF ASR SYSTEM

The ASR system can be actuated when the ASR switch is ON.

When the system detects slipping of the rear wheels and the ASR is actuated, the ASR actuation lamp lights up.

PRECAUTIONS WHEN USING**WARNING**

- The ASR system is actuated when the ASR switch is at the ON position.
- If any problem occurs in the system and it cannot carry out proper control, an action code is shown on the character display on the machine monitor, and the ASR system is canceled.
Drive the machine immediately to a safe place, stop the machine, and turn the ASR switch OFF.
- On road surfaces with an extremely low wear coefficient (icy road surfaces, etc.) or on steep slopes, it may be impossible to drive safely even when the ASR is actuated.

- On road surfaces where it is possible to carry out normal travel even when the ASR switch is turned OFF, if the road surface is slippery, be extremely careful not to let the machine slip to the side.
- If both rear wheels slip at the same speed, the ASR will not function. In this case, adjust the engine output with the accelerator pedal.

TROUBLESHOOTING

WHEN A PROBLEM OCCURS IN THE SYSTEM

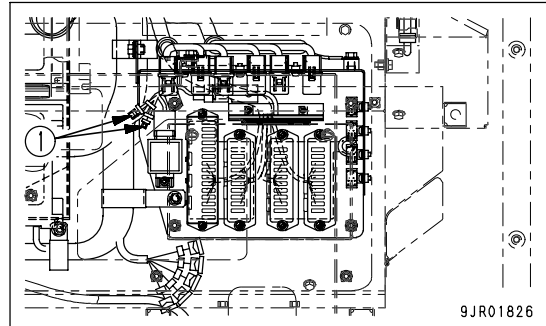
This system is equipped with a self-diagnostic function and displays an action code on the character display of the machine monitor. If an action code is displayed, check the code. For details, see "ACTION CODE (PAGE 3-138)".

Failure code		Type of failure	Action
DLt3	KA	Disconnection in transmission output shaft speed sensor	ASR canceled
Dk11	KX	Failure in accelerator sensor system	ASR canceled
DX18	MA	Failure in ASR electromagnetic proportional pressure reducing valve (left) (valve is not actuated)	ASR canceled
DX18	K4	Failure in ASR electromagnetic proportional pressure reducing valve (left) (valve remains actuated)	ASR canceled
DX17	MA	Failure in ASR electromagnetic proportional pressure reducing valve (right) (valve is not actuated)	ASR canceled
DX17	M4	Failure in ASR electromagnetic proportional pressure reducing valve (right) (valve remains actuated)	ASR canceled
DX18	KA	Disconnection in output wiring of ASR electromagnetic proportional pressure reducing valve (left)	ASR canceled
DX18	KB	Short circuit in output wiring of ASR electromagnetic proportional pressure reducing valve (left)	ASR canceled
DX18	KY	Short circuit with chassis ground in output wiring of ASR electromagnetic proportional pressure reducing valve (left)	ASR canceled
DX17	KA	Disconnection in output wiring of ASR electromagnetic proportional pressure reducing valve (right)	ASR canceled
DX17	KB	Short circuit in output wiring of ASR electromagnetic proportional pressure reducing valve (right)	ASR canceled
DX17	KY	Short circuit with chassis ground in output wiring of ASR electromagnetic proportional pressure reducing valve (right)	ASR canceled
DLF9	KA	Disconnection in wheel speed sensor (RL)	ASR canceled
DLF8	KA	Disconnection in wheel speed sensor (RR)	ASR canceled
DLF9	LC	Failure in wheel speed sensor (RL) system	ASR canceled
DLF8	LC	Failure in wheel speed sensor (RR) system	ASR canceled
DLF3	LC	Failure in transmission output shaft sensor	ASR canceled
DDDA	KA	Disconnection in ASR system switch	ASR canceled
DDDA	KB	Short circuit with chassis ground in ASR system switch	ASR canceled
DK30	KX	Failure in steering angle potentiometer	Recognizes steering angle as 20° and continues ASR control
DWNB	KA	Disconnection in shut-off valve output wiring	ASR canceled
DWNB	KB	Short circuit in shut-off valve output wiring	ASR canceled
DWNB	KB	Short circuit with chassis ground in shut-off valve output wiring	ASR canceled
DWNB	MA	Failure in shut-off valve (valve is not actuated)	ASR canceled
DWNB	K4	Failure in shut-off valve (valve remains actuated)	ASR canceled

BLEEDING AIR FROM ASR CIRCUIT

If the piping or valves in the ASR circuit have been replaced, bleed the air from the ASR circuit as follows.

1. Start the engine, check that the oil in the transmission case is the specified level, and check if the brake oil pressure caution lamp is out.
2. Turn the ASR switch ON, remove the cover behind the operator's seat, and connect connector TEST (1). The valve opens and oil pressure is applied to the ASR circuit.
3. Bleed the air from the rear brakes. For details, see MAINTENANCE, "BLEED AIR FROM REAR BRAKE (PAGE 4-32)".
4. After completing the air-bleeding operation, remove connector TEST (1) and install the cover.



HANDLING PAYLOAD METER (VHMS BUILT-IN TYPE)

OUTLINE OF SYSTEM

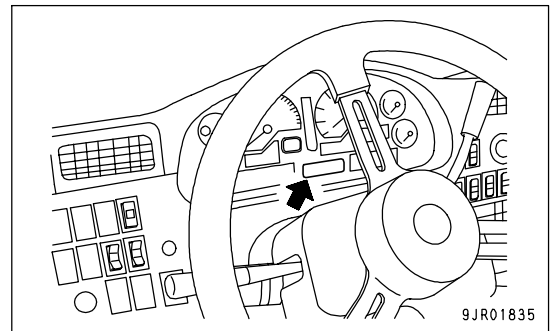
The payload meter detects the signals from the pressure sensors, clinometer, body float detection, neutral detection, and travel speed detection, and uses the microcomputer built into the controller to calculate the payload. The calculated payload is displayed on the character display on the machine monitor; the external display lamps also display the payload condition.

The data stored in the payload meter can be downloaded to a personal computer using the separately sold special software.

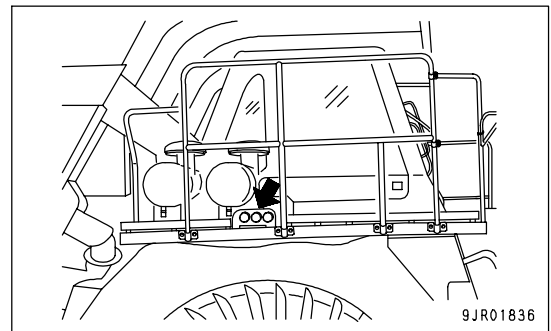
To ensure accuracy when operating the system, apply the parking brake when dumping, set the gearshift lever to N, release the retarder brake, and set so that the machine and payload display are both stable before starting the dumping operation. If the machine is stopped suddenly at the dumping point, it will take time for the payload display to stabilize.

Always carry out dumping on flat ground.

- Payload display

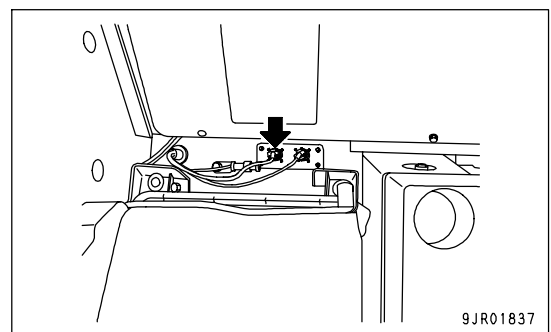


- External display lamps

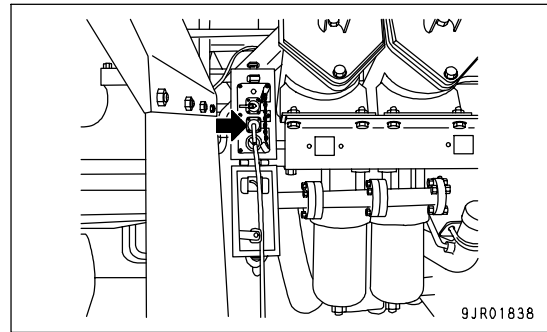


- Download connector inside cab
(end marked PLM)

When downloading, remove the connected cable. After completing the download operation, do not forget to restore the cable to its original position. If it is not restored, the download operation cannot be carried out from outside the cab.



- Download connector outside cab (end marked PLM)



NORMAL OPERATION DISPLAY

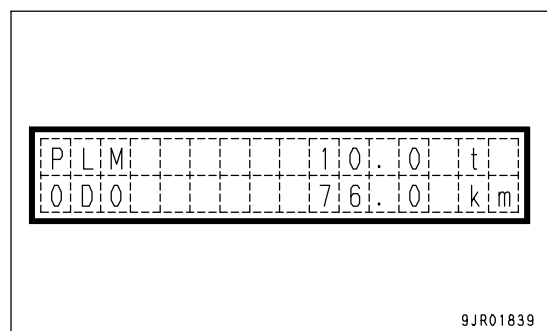
Machine condition		Machine monitor display	External display lamps
When starting switch is ON		-	Light up for 30 sec
When empty	Stopped (*1)	Standard display (*2)	OFF
	Traveling	Standard display	OFF
During loading	Stopped	Payload display (*3)	Payload display
	Traveling	Standard display	OFF
When loaded	Stopped	Payload display	Payload display
	Traveling	Standard display	OFF
When dumping	Stopped	Payload display → standard display	Payload display → OFF
	Traveling	Standard display	OFF

(*1) "Stopped" means that the gearshift lever is at the N position and the travel speed signal is 0.

(*2) For details of the standard display on the machine monitor, see "MACHINE MONITOR (PAGE 3-5)" and OTHER FUNCTIONS OF "OTHER FUNCTIONS OF MACHINE MONITOR (PAGE 3-26)" in the explanation for components in the OPERATION section.

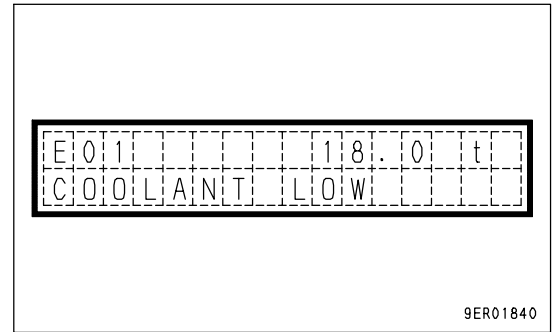
(*3) The machine starts off empty and is being loaded. It is necessary to wait for the load to go above approx. 15% of the rated payload and for the change in the load to stabilize when the machine is stopped.

- Example of payload display



- Example of payload display when error occurs

If an error occurs in the suspension pressure sensors or in the clinometer sensor, it becomes impossible to calculate the payload, so [-----] is displayed.

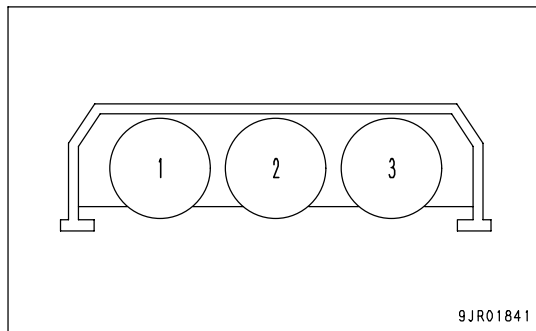


- When the machine is stopped during loading operations and when it is loaded, the service meter is not displayed on the character display.
If it is desired to display the service meter, keep the machine monitor inspection switch pressed. The software version and service meter will be displayed in turn on the bottom line of the character display.
- The payload at the loading point immediately after the loading operation may differ slightly from the display at the dumping point. This is caused by the effect of the friction in the suspension, and is impossible to remove. Even if the display value differs slightly according to the measurement point, it does not indicate any failure in the payload meter.

EXTERNAL DISPLAY LAMPS

- The external lamps display the payload as follows.

	Color of lamp	HD465-7	HD605-7
1	Green	23.0 tons and up	31.5 tons and up
2	Yellow	41.4 tons and up	56.7 tons and up
3	Red	48.3 tons and up	63.0 tons and up



! WARNING

If the red lamp lights up, the machine is overloaded. Do not haul a load under this condition. To prevent overloading, we recommend loading only up to a range where the yellow lamp lights up.

PREDICTED LOAD DISPLAY

- When the load changes in steps for each bucket loaded, the system estimates the total payload if one more bucket is loaded, and flashes the appropriate lamp to prevent overloading.
- The predicted load display and actual payload display are shown at the same time.

[Example: Case of HD465, expected number of bucket loads: 4]

- 1st bucket 11 tons
- 2nd bucket 11 tons (total: 22 tons)
- 3rd bucket 11 tons (total: 33 tons)
- 4th bucket 11 tons (total: 44 tons)

When the machine is loaded in this way, the external display lamps light up as shown in the chart below.

No. of loads	External display lamp	Remarks
1st bucket	<p style="text-align: center;">Green Yellow Red</p>	<ul style="list-style-type: none"> The weight actually loaded is 11 tons, so no lamp lights up. The predicted load is 22 tons, so no lamp flashes.
2nd bucket	<p style="text-align: center;">Green Yellow Red</p>	<ul style="list-style-type: none"> The weight actually loaded is 22 tons, so no lamp lights up. The predicted load is 33 tons, so the green lamp flashes.
3rd bucket	<p style="text-align: center;">Green Yellow Red</p>	<ul style="list-style-type: none"> The weight actually loaded is 33 tons, so the green lamp lights up. The predicted load is 44 tons, so the yellow lamp flashes.
4th bucket	<p style="text-align: center;">Green Yellow Red</p>	<ul style="list-style-type: none"> The weight actually loaded is 44 tons, so the green and yellow lamps light up. The predicted load is 55 tons, so the red lamp flashes.

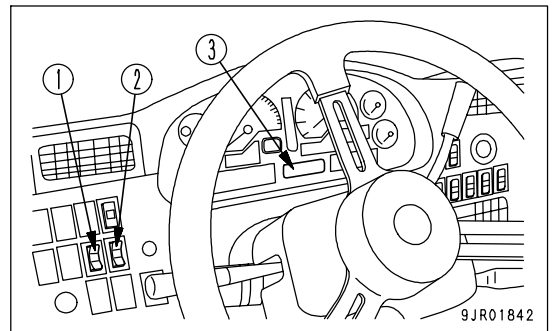
PERFORMING CALIBRATION

Carry out calibration at the following occasions.

- When the machine or payload meter are received
- Once every month
- When the suspension cylinder gas pressure and oil amount have been adjusted (when the suspension has been adjusted)
- When the suspension pressure sensor has been replaced
- When the machine has been modified and the weight of the machine when empty has changed more than 100 kg (221 lb)

METHOD OF PERFORMING CALIBRATION

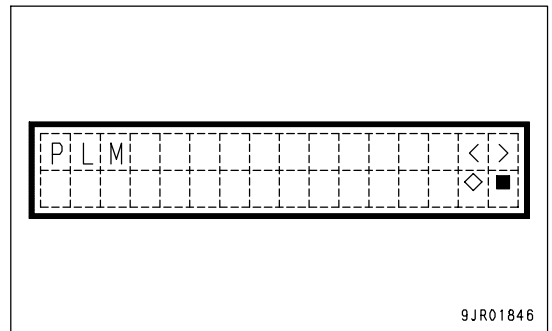
1. Set the machine empty. When doing this, remove all the remaining soil inside the dump body.
2. Run in the machine.
3. With the engine still running, set the gearshift lever to the N position and stop the machine.
4. Using the following procedure, operate machine monitor mode selector switches 1 (1) and 2 (2) and carry out the preparatory work for calibration.



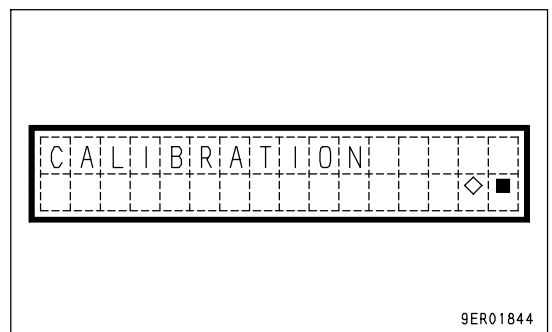
- 1) With the service meter/odometer value displayed on character display (3) of the machine monitor, press the (◇) of machine monitor selector switch 1 (1) to display the value for reverse travel.

For details of the method of displaying the reverse travel odometer, see "OTHER FUNCTIONS OF MACHINE MONITOR (PAGE 3-26)".

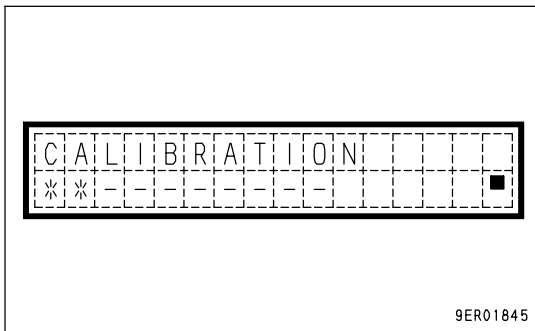
- 2) Press the (>) of machine monitor selector switch 2 (2) several times and display "PLM".



- 3) Press the (◇) of machine monitor selector switch 1 (1) and display CALIBRATION. Then, press the (◇) and check that the word CALIBRATION flashes.



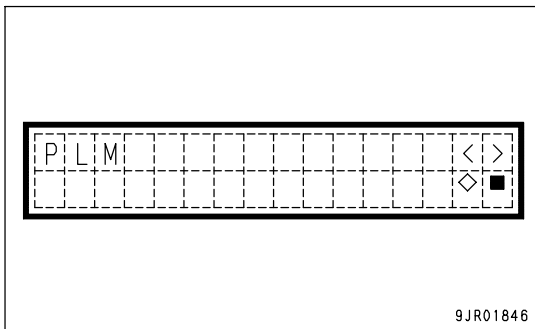
5. Drive the machine at a speed of 10 km/h (6.2 MPH). When the travel speed becomes stable, press the (◇) of machine monitor selector switch 1 (1) and display CALIBRATION. The word CALIBRATION flashes two or three times, and then the display on the right is given.



REMARK

When canceling, press the (■) of machine monitor selector switch (1) when the display on the right is being given.

6. Continue traveling at a speed of 10 km/h (6.2 MPH), and if the display on the right is given after approx. 30 seconds, the calibration is completed.



REMARK

If the (■) of machine monitor selector switch (1) is kept pressed, the display returns to the service meter/odometer display.

NOTICE

- Carry out the calibration when traveling on a flat road surface.
- Carry out the calibration when traveling in a straight line (distance: approx. 100 m (328 ft 1 in)). When traveling, maintain a speed of approx. 10 km/h (6.2 MPH).
- Do not carry out calibration if there is an existing error.
- Lower the dump body to seat it and set the dump lever to the FLOAT position before carrying out calibration. To confirm that the dump body is fully seated, check that the body pilot lamp is OFF.

DATA STORED IN PAYLOAD METER

- The payload meter takes the cycle from one dumping operation to the next dumping operation as one cycle and records the data.
- Cycle data items

Date (month/day) of dumping	Time of traveling empty	Time remaining stationary when loading	Time remaining stationary when loaded
Time of dumping	Distance traveled empty	Time traveling loaded	Time taken to dump
Machine ID	Travel speed when empty (max.)	Distance traveled loaded	Speed limit
Open ID	Travel speed when empty (ave.)	Travel speed when loaded (max.)	Warning items for each cycle
Payload	Time remaining stationary when empty	Travel speed when loaded (ave.)	

- The maximum limit for stored cycle data is 2900 cycles. If 2900 cycles is exceeded, the old data is overwritten.
- Download the recorded data using the RS232C port of a personal computer which has the separately sold special software installed.

The downloaded data is saved in the specified location on the personal computer as a text file (CSV file). For details, see the instruction manual for the special software.

It is possible to check the downloaded data with a commercially available spreadsheet software that can read text files.

PROCEDURE WHEN DOWNLOADING

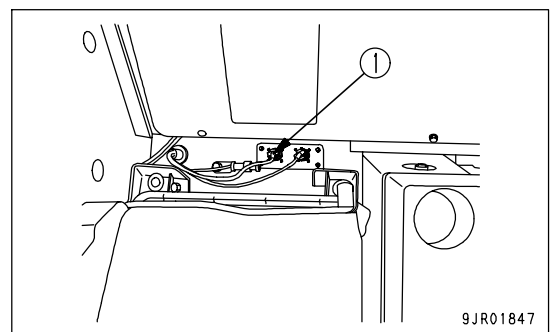
CAUTION

- When handling the cables, be careful not to damage them or pull them by force.
- Do not leave the connectors disconnected.
- Take steps to prevent dirt from entering the connector portion.
- Do not let any metal objects touch the connector portion.

Download the recorded data to a personal computer which has the separately sold special software installed.

DOWNLOADING FROM DOWNLOAD CONNECTOR INSIDE CAB (REAR OF ASSISTANT'S SEAT)

1. Remove connector (1) at the end marked PLM, and connect the download cable supplied with the special software. Connect the other end of the cable to the RS232C port of the personal computer.
2. Turn the starting switch to the ON position.



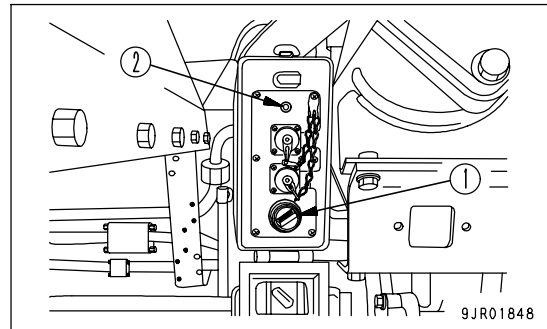
3. Start up the personal computer and use the special software to download the data.
The download software for the HD465/605 card type payload meter can be used as it is for the special software.
4. After completing the download operation, always return the cables to their original position.

DOWNLOADING FROM GROUND LEVEL DOWNLOAD BOX OUTSIDE CAB

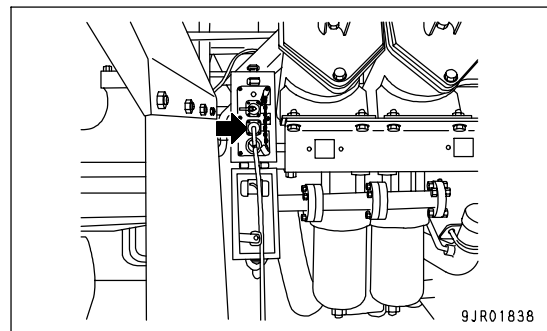

WARNING

When downloading from outside the cab, check that the machine starting switch is at the OFF position. In addition, be careful that the starting switch inside the cab is not turned to the ON position during the download operation. During the download operation, pay careful attention to the machine and the surrounding area.

1. Turn the starting switch to the OFF position.
2. Open the ground level download box. Use the starting switch key to open or close the box.
3. Set switch (1) inside the box to the ON position. After a short time, display lamps (2) will light up.



4. Connect the download cable supplied with the special software to the end marked PLM, Connect the other end of the cable to the RS232C port of the personal computer.
5. Start up the personal computer and use the special software to download the data. For details of the download operation, see "DOWNLOADING FROM DOWNLOAD CONNECTOR INSIDE CAB (REAR OF ASSISTANT'S SEAT) (PAGE 6-27)".



6. After completing the download operation, return the switch inside the box to the OFF position, then close the box securely.

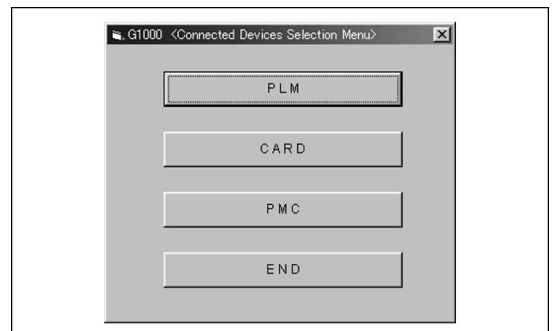
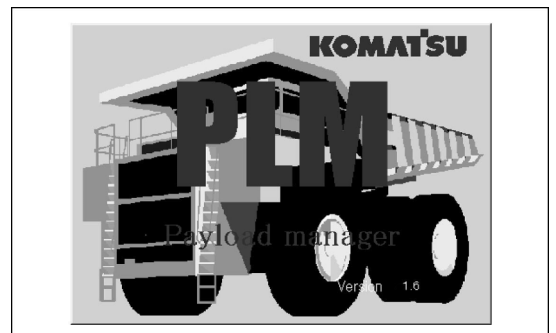
DOWNLOAD SOFTWARE

For details of installing the software, see the instruction manual provided with the download software.

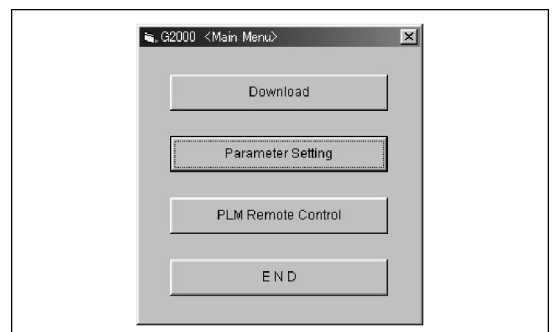
1. When the installation is completed, the icon shown in the diagram on the right is created.



2. Double click the icon. The download software is started and the screen shown in the diagram on the right is displayed. After that, screen [G1000] is displayed, so click [PLM]. [CARD] and [PMC] are not used, so do not click them.

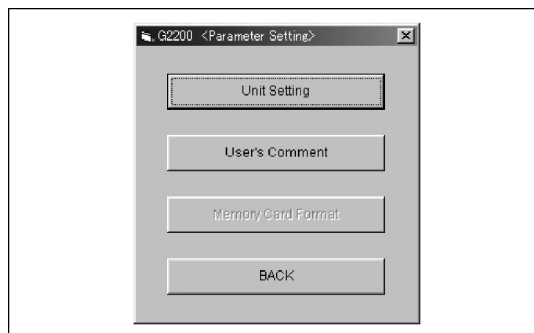


3. Click [Parameter Setting] on screen [G2000]. [PLM Remote Control] is not used, so do not click it.



4. Click [Unit Setting] on screen [G2200]. Screen [G2210] is displayed.

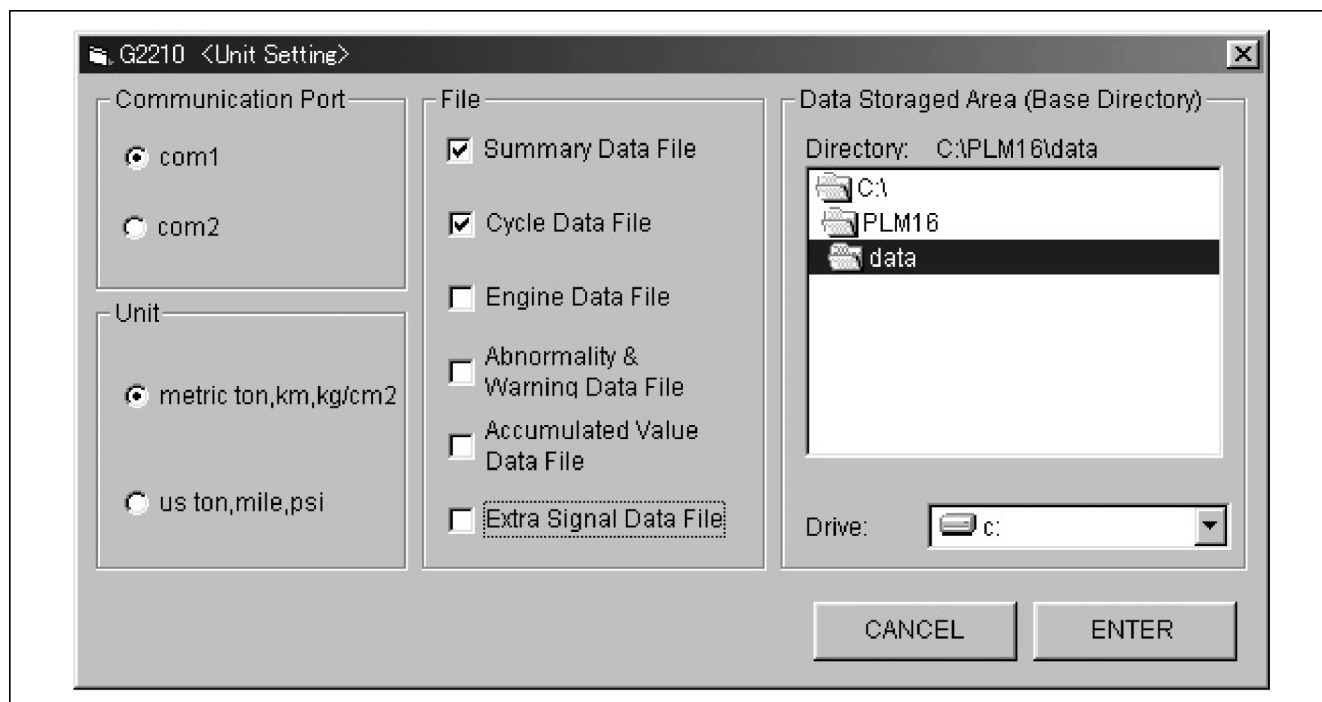
[User's Comment] is not used, so do not click it.



5. On screen [G2210] it is possible to select the communication port (Com1, Com2), specify the destination for saving the downloaded data, specify the file name, and select the unit for the data. For details, see the instruction manual for the download software.

The files used for the HD465-7 and HD605-7 are the files for the summary and cycle data only, so put a check mark against [Summary Data File] and [Cycle Data File] in [File]. Once the setting is made, there is no need to make any setting when the next download is carried out.

Click [Enter] to return to screen [G2200].



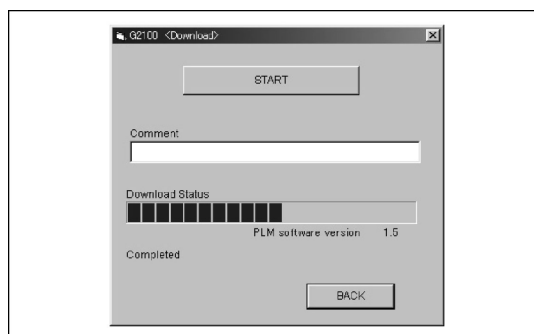
6. On screen [G2200], click [BACK] to return to screen [G2000].

7. Click [Download] on screen [G2000]. Screen [G2100] is displayed, so click [START] to download.

After completing the download operation, click the [X] at the top right of the screen to close the screen.

REMARK

Depending on the version of the software, screen [G2101 <Download - File ID>] is displayed. Input the file ID, then click [OK] to start the download operation.

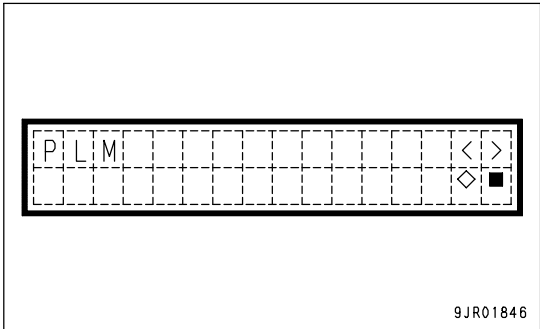


MACHINE ID, OPEN ID

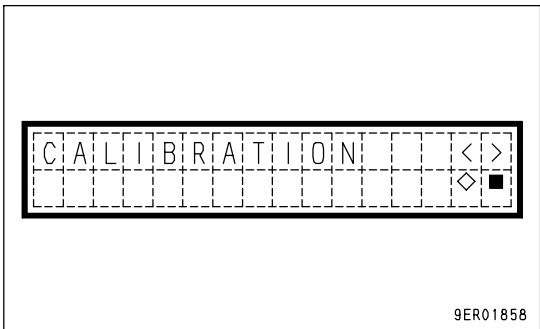
It is possible to change the machine ID and open ID, which are cycle data items. When changing the machine Serial No. for the machine ID or the operator or type of load for the open ID, set the value specified by the customer beforehand to make it possible to use to check the operator and type of load for the applicable cycle afterwards.

METHOD OF SETTING MACHINE ID, OPEN ID

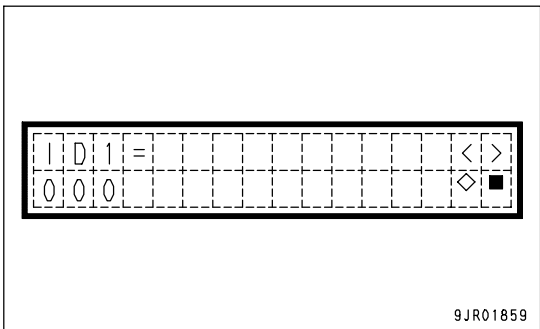
1. When the service meter/odometer is being displayed on the character display of the machine monitor, press the (◇) of machine monitor selector switch 1 to display reverse travel.
For details, see "OTHER FUNCTIONS OF MACHINE MONITOR (PAGE 3-26)".
2. Press the (>) of machine monitor selector switch 2 several times to display "PLM".



3. Press the (◇) of machine monitor selector switch 1 to display "CALIBRATION".



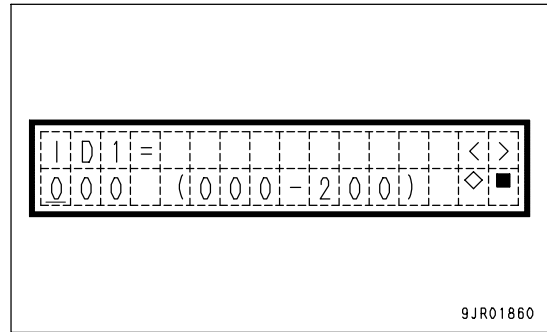
4. Press the (>) of machine monitor selector switch 2 to display the screen shown in the diagram on the right.
ID1 corresponds to the machine ID.
The present setting is displayed on the bottom line.



- Press the (◇) of machine monitor selector switch 1 to display the screen shown in the diagram on the right.

The available settings range from 0 to 200; input in order from the first digit. The place for insertion is marked by the cursor. Press the (<) or (>) of machine monitor selector switch 2 to select 0 to 9. After inputting the value, press the (◇) of machine monitor selector switch 1. The cursor will move to the next position.

Repeat this procedure to input the values for all the digits, then confirm the settings and return to the previous screen.

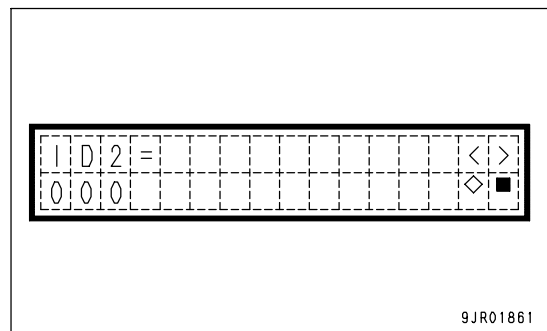


If the (■) of machine monitor mode selector switch 1 is pressed while inputting any value, the value will stay as it is and the cursor will move to the first digit. If any mistake is made in the input, input again from the first digit.

To abandon the input operation, press the (■) of machine monitor mode selector switch 1 again and return to the previous screen.

- When setting the open ID, press the (>) of machine monitor selector switch 2 at Step 4 to display the screen shown in the diagram on the right.

The procedure for setting is the same as for ID1 (machine ID).



- Press the (■) of machine monitor selector switch 1 several times to return to the service meter/odometer display.

PAYLOAD (CYCLE DATA ITEM)

- The payload measurements, which are recorded as data, apply to the haul payload in the applicable cycle.
 - There are the following two methods of confirming the haul payload.
- 1: At the dumping point, record the payload when the dump lever is moved from FLOAT to any position other than FLOAT.
 - 2: Process the data sampled when traveling from the loading point to the dumping point, then confirm and record the haul payload when dumping.
- When the machine is shipped from the factory, the same Method 1 is used as for the conventional card type payload meter (PLM II).
- The method for processing and confirming the payload in Step 2 above is useful if the dumping point is at an angle.
- If you wish to change the method of confirming the haul payload, please ask your Komatsu distributor to carry out the change.

SERVICE FUNCTIONS

The following functions are available, but for normal use, there is no need to make any change. If it is necessary to change the setting, please consult your Komatsu distributor.

1. Setting travel distance needed to recognize completion of loading
The payload meter is set to judge that the loading is completed when the machine has traveled 160 m (524 ft 11 in) continuously from the loading point. If the dumping point is within 160 m (524 ft 11 in) from the loading point, the system will not judge that dumping has taken place, so the cycle data at that point will be incomplete. In cases where the loading point and the dumping point are extremely close, use this function to change to the setting for the travel distance needed to recognize the completion of loading.
2. Selecting method of confirming recorded payload
Use this function to change the selection of the method below to confirm the haul payload.
 - 1) At the dumping point, record the payload when the dump lever is moved from FLOAT to any position other than FLOAT.
 - 2) Process the data sampled when traveling from the loading point to the dumping point, then confirm and record the haul payload when dumping.

OTHERS

- If it is necessary to correct the data or time during the download operation, please consult your Komatsu distributor.
- If the payload and external display lamp display is different, or there is some error in the directory where the data is downloaded by the special software, there may be a mistake in the setting for the machine. In such a case, please consult your Komatsu distributor.
- Use a serial communication port (RS232C) to download the data.
For computers without an RS232C port, it may be possible to use a third party USB-RS232C conversion adapter. (Part for operation check: IO DATA USB-RSAQ2)
However, this does not guarantee the operation. In addition, the download software supports COM1 and COM2, so check which port it can be connected to.
- The payload meter has the function of communicating with the external equipment prepared by the customer. For details, please check with your Komatsu distributor.
However, communications are carried out using the RS232C port for downloading, so in this case, it is impossible to download the data from the inside or outside of the cab.

If a card-type payload meter is installed to a machine with a built-in VHMS type payload meter, the VHMS type payload meter will not work.

HANDLING PAYLOAD METER II (CARD TYPE)

- The payload meter inputs the signals from the pressure sensors, clinometer (*1), body float detection, and neutral detection, and uses the built-in microcomputer to calculate the amount loaded. It then displays the calculated load on the panel display and also displays the load on the external display lamps.
(*1) This is not installed on the -60°C specification.
- The payload meter always carries out self-diagnosis of the system, and if any problem or warning occurs, it displays the content.
- It is also possible to use the switches on the payload meter itself to display the aggregate payload or total number of cycles from a certain time, and to forcibly display problem and warning items that are now occurring, or have already occurred and been restored to normal.
- The payload meter automatically records dump truck operation data, such as the payload, time, distance, and travel speed for each cycle, together with the time and date of starting or stopping the engine, time and date of the occurrence and remedy for problems or warnings, and the aggregate payload and total number of cycles from any given time.

These automatically recorded data are retained when the power is turned off, so it is possible to send (download) the data to a personal computer from the payload meter through a cable connected to the port (ANSI/EIA RS-232C) inside the cab. In addition, based on these data, the truck operation data can be displayed on a personal computer screen, printed out, or converted to LOTUS 1-2-3 or EXCEL data.

Furthermore, if a memory card is inserted in the payload meter, these data can be written to the memory card and then read to a personal computer from the memory card, so the data can be processed in the same way as with cable communications using a personal computer.

REMARK

The personal computer software supplied by Komatsu is necessary for downloading the data, reading the data from a memory card to a personal computer, and processing the data.

- It is possible to set the machine ID, open ID, and travel speed limit for each payload meter (in other words, for each machine).

If a card-type payload meter is installed to a machine with a built-in VHMS type payload meter, the VHMS type payload meter will not work.

METHOD OF USING ACCURATELY

1. Recorded payload data

When the dump lever is operated from FLOAT to any position other than the FLOAT, the payload is recorded. The reason for this is the following two points.

- To measure the payload that has actually been carried
The payload can be measured more accurately by measuring the load that is actually dumped after subtracting the loss caused by spillage of the load during travel.
- The measurement is carried out based on the pressure of each suspension, and after the machine has traveled, the variation of the friction force at each place has been evened out, so it is possible to measure accurately.

When dumping the load, if the machine shakes and the payload display fluctuates, wait for the payload display to stabilize before dumping the load. (If the dump truck is stopped suddenly at the dumping point, it will take time for the payload display to stabilize.)

2. The payload display at the loading point (immediately after the loading) may be slightly less (1-5 tons) than the value displayed at the dumping point. This is caused by the differences in the friction force of the suspension, and it is impossible to remove this.

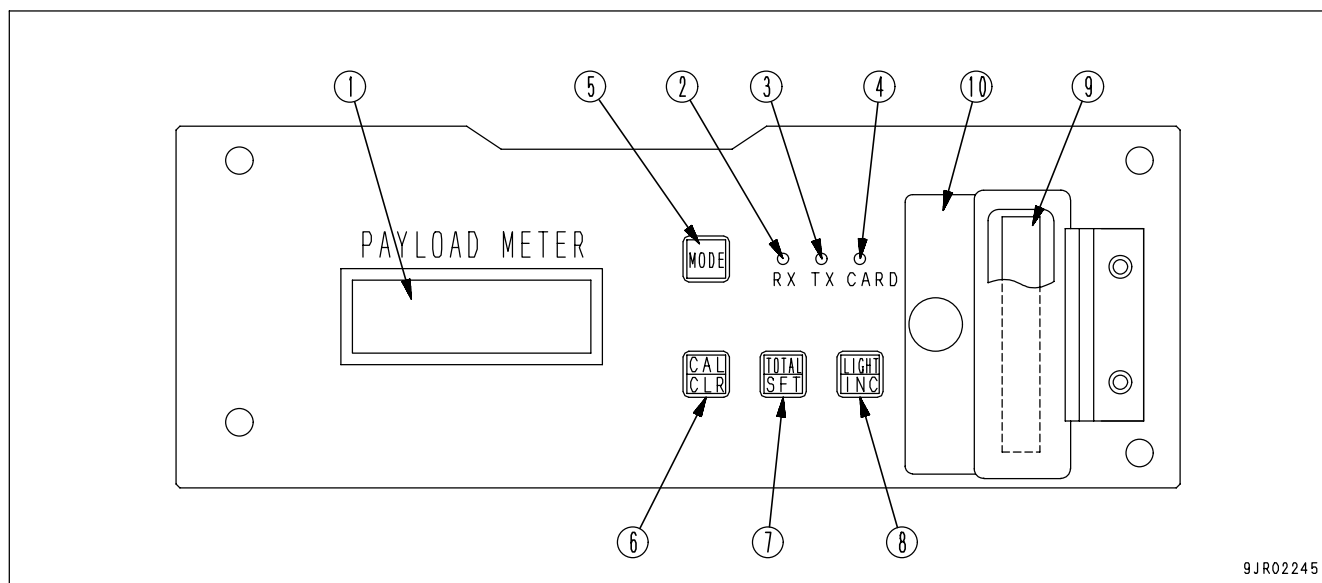
Even if the displayed value at the measurement location is slightly different, it is not caused by any failure in the payload meter.

GENERAL LOCATIONS

CONTROLLER SCREEN

**CAUTION**

When not inserting or removing memory card (9), always keep cover (10) closed.



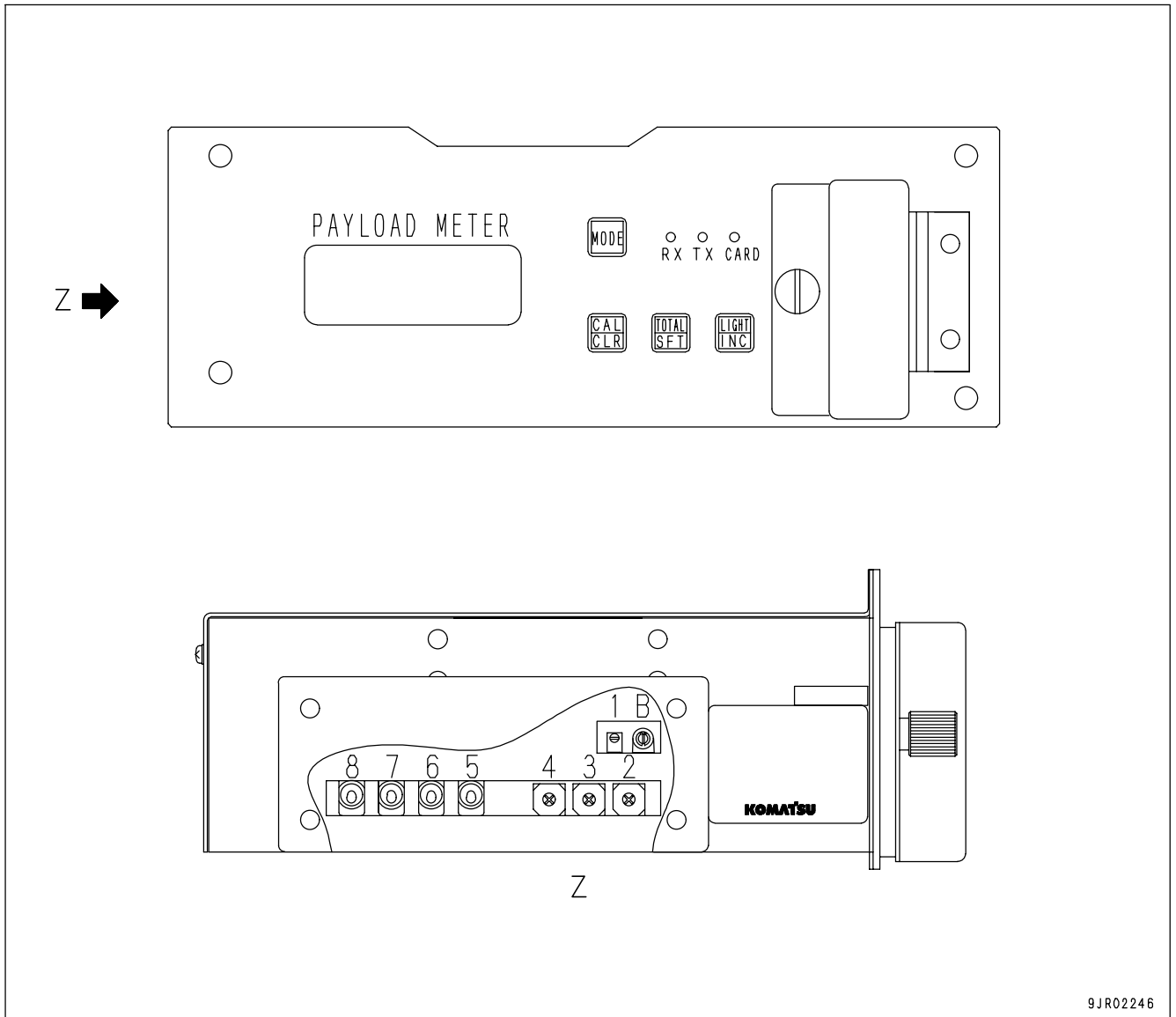
9JR02245

- | | |
|---|------------------------------|
| (1) Display panel | (6) Calibration/clear switch |
| (2) Reception pilot lamp (Rx busy) | (7) Total/shift switch |
| (3) Transmission pilot lamp (Tx busy) | (8) Light/increment switch |
| (4) Memory card access lamp (CARD busy) | (9) Memory card |
| (5) MODE switch | (10) Cover |

REMARK

Transmission pilot lamp (3) lights up when the communication cable is not connected to the personal computer or when it is not properly connected.

LEFT FACE OF CONTROLLER



9JR02246

DETAILS OF SWITCHES ON LEFT SIDE

No.	Name	Type	Remarks
1	Payload gain adjustment trimmer	Rotary volume	-20 % to 20 % (Turn to left) - (Turn to right)
2	Speed regulation switch	0 - F Rotary switch	0: 107 % to 7: 100 % to F: 92 %
3	Distant regulation switch	0 - F Rotary switch	0: 107 % to 7: 100 % to F: 92 %
4	Model selection switch	0 - F Rotary switch	Refer to model selection chart
5	Use of memory-card switch	2-Stage selector switch	Up: not used; Down: used
6	Use of clinometer switch	2-Stage selector switch	Up: not used; Down: used
7	Mass unit setting switch	2-Stage selector switch	Up: metric tons; Down: short tons
8	Forced prohibition setting for switches	2-Stage selector switch	Up: permitted Down: prohibited According to permitted/prohibited setting table for switches
B	Buzzer volume regulation	Rotary volume	For MIN volume, turn to RIGHT For MAX volume, turn to LEFT

NOTICE

The switches on the left side are set when the machine is shipped from the factory.

Do not touch any switch except No. 7 and No. B.

If you wish to adjust any switch except No. 7 and No. B to compensate the payload calculation value or speed or distance calculation value, please contact your Komatsu distributor.

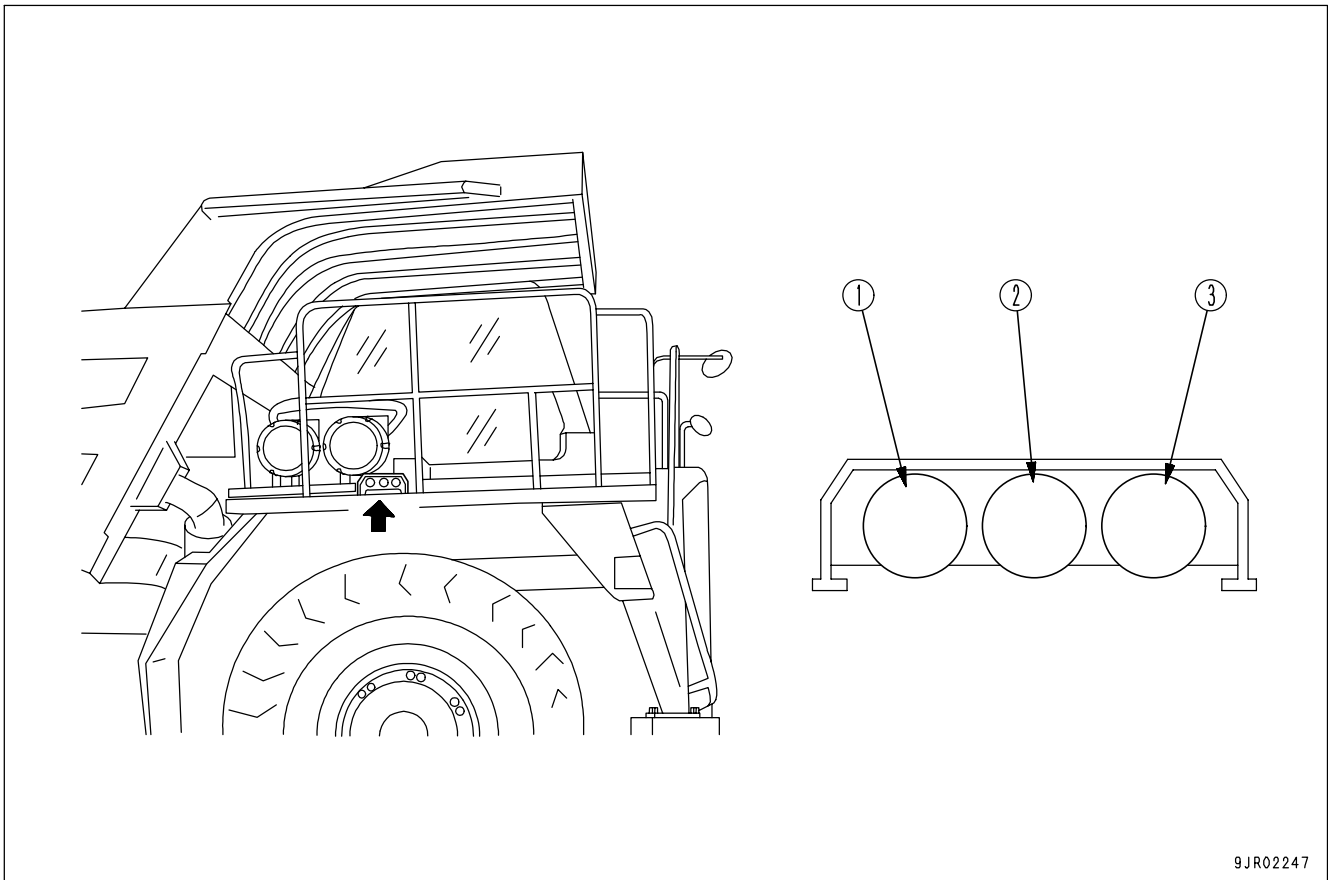
MODEL SELECTION CODE CHART

Model selection code display	Model		
0	HD1200-1 STD	Large-tire	Cummins engine
1	HD785-3 STD	Large-tire	Komatsu engine
2	HD465-5/-7 STD	Small-tire	Komatsu engine
3	HD325-6 STD	Large-tire	Komatsu engine
4		-	
5		-	
6	HD785-3 STD	Small-tire	Komatsu engine
7	HD465-5/-7 STD	Large-tire	Komatsu engine
8	HD405-6 Quarry	Large-tire	Komatsu engine
9	HD985-3/-5 STD	30.00-51	Komatsu engine
A	HD605-5/-7 Quarry	Large-tire	Komatsu engine
B	HD785-5 STD	Large-tire	Komatsu engine
C		-	
D		-	
E		-	
F		-	

PERMITTED/PROHIBITED SETTING TABLE FOR SWITCHES

		Left side switch No. 8	
		Down (prohibited)	Up (permitted)
Left side switch No. 5	Up (memory card not used)	(1)	(2)
	Down (memory card used)	(3)	(4)

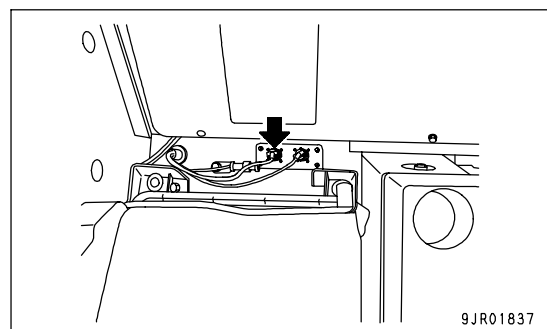
- (1) Left side switch No. 5 (up) and No. 8 (down)
Only calibration operation, data all clear, time and date setting operation are permitted.
- (2) Left side switch No. 5 (up) and No. 8 (up)
Operation of all switches is permitted.
- (3) Left side switch No. 5 (down) and No. 8 (down)
Only calibration operation, data all clear, card dump, time and date setting operation are permitted.
- (4) Left side switch No. 5 (down) and No. 8 (up)
Operation of all switches is permitted.

EXTERNAL DISPLAY LAMPS

- (1) Green lamp
- (2) Yellow lamp
- (3) Red lamp

COMMUNICATIONS CABLE CONNECTION PORT FOR PERSONAL COMPUTER

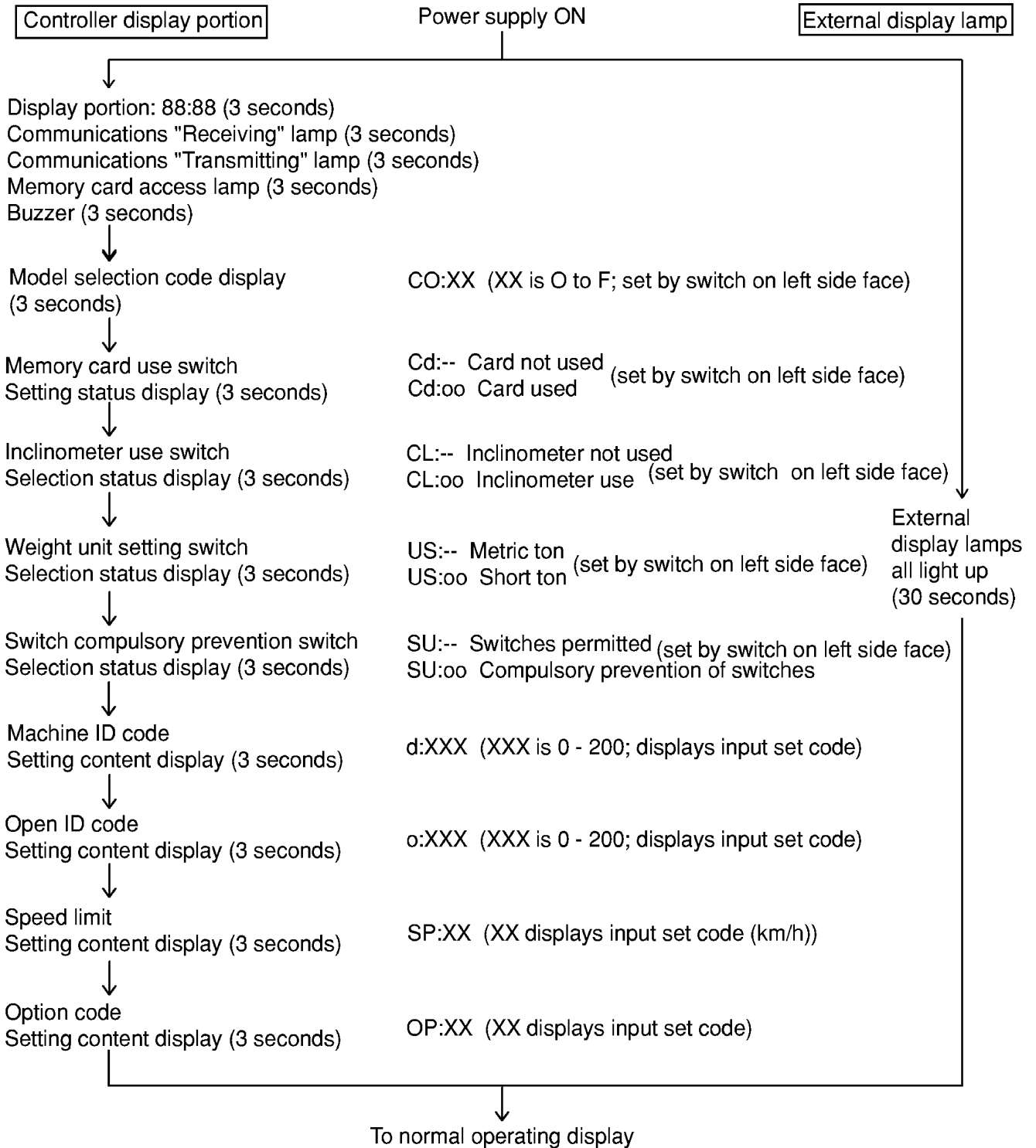
- Download connector (side marked PLM)
When downloading, remove the cable that is connected. After completing the download operation, always return the cable to its original position.



CONTENT OF DISPLAY (CONTROLLER, EXTERNAL DISPLAY LAMPS)

WHEN THE POWER IS ON

When the power is turned ON, the displays on the controller display and external display lamps are as follows.



If the engine is started during this flow of displays, even if there are items remaining which should still be displayed, the display switches after several seconds to the display given during normal operations. The machine ID code, option ID code, speed limit, and option code, see "OPERATOR CHECK MODE (PAGE 6-56)".

DISPLAY DURING NORMAL OPERATIONS

Condition of machine		Gearshift lever position	Dump lever position (*1)	Display panel	External display lamps
When empty	Stopped	N	FLOAT	Payload display (*2)	Payload display
	Traveling	Except N	FLOAT	Time display	OFF
During loading, until 50% of standard payload is reached	Stopped (*3)	N	FLOAT	Payload display	Payload display and display of estimate
	Traveling	Except N	FLOAT	Payload display	OFF
During loading, after 50% of standard payload is reached	Stopped	N	FLOAT	Payload display	Payload display and display of estimate
	Traveling (*4)	Except N	FLOAT	Travel distance displayed in units of meter from 0 to 160 m (every 5 m) -> after completion, time display	OFF
When loaded	Traveling	Except N	FLOAT		OFF
	Stopped (*5)	N	FLOAT	Payload display	Payload display
When dumping (*6)		N	FLOAT-> RAISE-> LOWER-> FLOAT	Total payload display (*7) goes out	OFF
When problem or warning is generated		-	-	See "PROBLEM AND WARNING DISPLAY (ERROR CODE)(6-75 PAGE)".	See "PROBLEM AND WARNING DISPLAY (ERROR CODE)(6-75 PAGE)".

See the next page for details of Notes *1 to *7.

- *1: Between the start of the loading operation and the start of the dumping operation, always keep the dump lever at the FLOAT position. If the dump lever is operated to any position other than FLOAT, the data will not be recorded when dumping, or the data will be recorded, but the data for time, distance, and speed will not be recorded accurately.
With the display, [b-FL] may be displayed instead of the total payload when dumping, and after completion of loading, the time display may be given instead of the distance display when starting to travel.
- *2: When the load is less than 50% of the standard payload, 0 t is displayed.
- *3: If there is no new load within 5 minutes from the time of the previous load:
Both the display panel and external display lamps will change to the display for "When empty, Stopped" in the table.
- *4: If the machine is stopped again before traveling 160 m, both the display panel and external display lamps will return to the display for "During loading, Stopped" in the table.
If the load is dumped before traveling 160 m, both the display panel and external display lamps will jump to the display for "When dumping" in the table.
- *5: If loading is carried out again when this happens:
Immediately after loading again, both the display panel and external display lamps will return to the display for "During loading, Stopped" in the table.
- *6: If the load that is dumped is not more than 50% of the standard payload, the machine will not recognize that a load has been dumped. It will consider it only as a movement of the dump lever. (See *1)
- *7: The display for the total payload is given in units of 100 t (rounded to the nearest 100).
For the method of clearing the total payload (resetting of the measurement to 0), see "FORCED DISPLAY OF TOTAL PAYLOAD AND OVERALL NUMBER OF CYCLES (PAGE 6-54)".
When dumping, if the gearshift lever is at any position other than N, [b-FL] flashes. If the dump lever is at any position other than FLOAT from the beginning of the loading operation to the end of the dumping operation, the data will not be recorded accurately. (See *1)

The payload meter retains the existing condition when it is empty, during loading, and when it is loaded, even if the power is turned OFF, so when the operator starts operation again, the system starts from the existing machine condition.

NOTICE

When stopping the machine empty, stopping it during loading, or stopping it when loaded, always set to the gearshift lever at the N position. (See "DISPLAY DURING NORMAL OPERATIONS (PAGE 6-42)".)

If this is not done, the time that the machine is stopped will not be calculated, and it will be included in the travel time when empty or the travel time when loaded. As a result, the average travel speed will appear to be lower and the data stored in the payload meter will not be accurate. In addition, the external display lamps will also stay OFF.

NOTICE

In the following cases (1) to (4), the condition of the dump truck as seen by the payload meter will be different from the actual condition of the dump truck.

(1) When a new controller has been installed

(2) When the controller has been replaced

See "OPERATION WHEN ERROR CODE F.CAL IS DISPLAYED OR CONTROLLER HAS BEEN REPLACED (PAGE 6-85).

(3) When the built-in battery has been replaced

See "WHEN ERROR CODE F-09 IS DISPLAYED (PROCEDURE FOR REPLACING BATTERY) (PAGE 6-82).

(4) In addition, if either of the following conditions should occur

- The external display lamps give the estimate display although no loading is taking place.
- The display gives the time display when loading even if more than 50% of the standard payload is loaded and the machine starts to travel. (The distance display is not given when traveling 0 to 160 m.)

In the case of (1) or (4), carry out calibration with the machine empty, then load it close to the rated payload and dump the load. The payload meter will recognize the empty (stopped) condition.

Note that the cycle data recorded when dumping may be partially inaccurate.

NOTICE

- After starting dumping (operating the dump lever from FLOAT to RAISE), do not turn the power OFF within 5 seconds after completing the dumping (operating the dump lever from LOWER to FLOAT).
- Also, with operations other than dumping, do not turn the power OFF within 5 seconds after operating the dump lever to FLOAT from any position other than FLOAT.
- If the starting switch has been left at the ON position (power ON) for a long period without starting the engine, first turn the starting switch to the OFF position, then start the engine.
- If the engine is started without turning the starting switch first to the OFF position, the time that the starting switch was at the ON position without starting the engine will also be calculated as part of the "Stopped, Empty" time or the "Stopped, Loaded" time.

EXTERNAL DISPLAY LAMPS

DISPLAY LEVEL FOR LAMPS

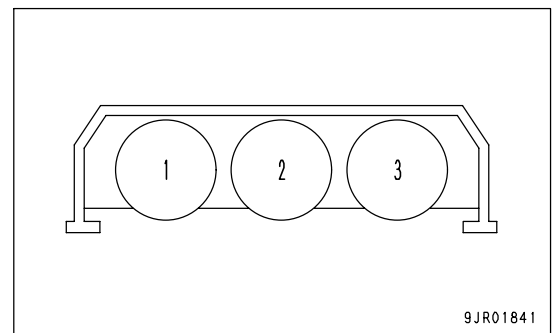


WARNING

If the red lamp lights up, the machine is overloaded. Do not haul a load under this condition. To prevent overloading, we recommend loading only up to a range where the yellow lamp lights up.

- The external lamps display the payload as follows.

	Color of lamp	HD465-7	HD605-7
1	Green	23.0 tons and up	31.5 tons and up
2	Yellow	41.4 tons and up	56.7 tons and up
3	Red	48.3 tons and up	63.0 tons and up



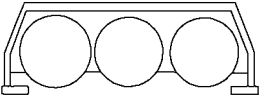
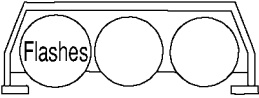
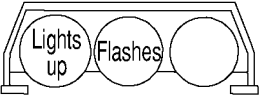
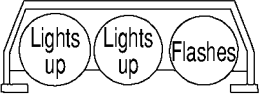
ESTIMATE DISPLAY

- When the load changes in steps for each bucket loaded, the system estimates the total payload if one more bucket is loaded, and flashes the appropriate lamp to prevent overloading.
- The predicted load display and actual payload display are shown at the same time.

[Example: Case of HD465, expected number of bucket loads: 4]

- 1st bucket 11 tons
- 2nd bucket 11 tons (total: 22 tons)
- 3rd bucket 11 tons (total: 33 tons)
- 4th bucket 11 tons (total: 44 tons)

When the machine is loaded in this way, the external display lamps light up as shown in the chart below.

No. of loads	External display lamp	Remarks
1st bucket	 <p>Green Yellow Red</p>	<ul style="list-style-type: none"> • The weight actually loaded is 11 tons, so no lamp lights up. • The predicted load is 22 tons, so no lamp flashes.
2nd bucket	 <p>Green Yellow Red</p>	<ul style="list-style-type: none"> • The weight actually loaded is 22 tons, so no lamp lights up. • The predicted load is 33 tons, so the green lamp flashes.
3rd bucket	 <p>Green Yellow Red</p>	<ul style="list-style-type: none"> • The weight actually loaded is 33 tons, so the green lamp lights up. • The predicted load is 44 tons, so the yellow lamp flashes.
4th bucket	 <p>Green Yellow Red</p>	<ul style="list-style-type: none"> • The weight actually loaded is 44 tons, so the green and yellow lamps light up. • The predicted load is 55 tons, so the red lamp flashes.

DETAILS OF DATA STORED IN MEMORY OF PAYLOAD METER

The payload meter stores the data in this section in non-volatile RAM.

This data are retained even when the power is switched OFF, so they can be used later as follows.

- (1) The data can be downloaded to a personal computer through a cable connected to the RS-232C port, and the personal computer can be used to display these data or to print them out using a printer. The data stored in the personal computer can be converted to a form that can be processed using Lotus 1-2-3 or Excel, so these data can be processed freely and used to make forms.
- (2) The data in the non-volatile RAM can be downloaded to a memory card inserted in the payload meter, and the data can be read from this memory card to a personal computer. After reading it to the personal computer, it can be processed in the same way as in Item (1).

REMARK

For details of the procedure for Items (1) and (2), please see the software manual provided with the personal computer.

CYCLE DATA

One cycle is taken as the time from the point where the load is dumped to the point where the next load is dumped, and the data between these two points are recorded.

The cycle data are sent to the RAM every time the load is dumped.

The maximum number of cycles that can be stored in memory is 2900 cycles.

Item	Unit	Range	
Engine operation No.	Integer	1 - 65535	These show value, set value when dumping
Month	Month	1 - 12	
Day	Day	1 - 31	
Time Hour	Hour	0 - 23	
Time Min	Minute	0 - 59	
Machine ID	Integer	0 - 200	
Open ID	Integer	0 - 200	
Payload	MT or ST	0 - 6553.5	
Travel time when empty	MIN	0 - 6553.5	
Travel distance when empty	km	0 - 25.5	
Max. travel speed when empty	km/h	0 - 99	
Average travel speed when empty	km/h	0 - 99	
Stopping time when empty	MIN	0 - 6553.5	
Stopping time during loading	MIN	0 - 6553.5	
Travel time when loaded	MIN	0 - 6553.5	
Travel distance when loaded	km	0 - 25.5	
Max. travel speed when loaded	km/h	0 - 99	
Average speed when loaded	km/h	0 - 99	
Stopping time when loaded	MIN	0 - 6553.5	
Dumping time	MIN	0 - 25.5	Shows set value when dumping
Speed limit	km/h	0 - 99	
Warning items for each cycle			See (*1)
Analog spare 1			See (*2)
Max. electric potential	V	0 - 4.0	
Min. electric potential	V	0 - 4.0	
Average electric potential	V	0 - 4.0	
Analog spare 2			
Max. electric potential	V	0 - 4.0	
Min. electric potential	V	0 - 4.0	
Average electric potential	V	0 - 4.0	
Digital spare 1			
Times for Lo	Times	0 - 255	
Digital spare 2			
Times for Lo	Times	0 - 255	

(MT: Metric Ton; ST: Short Ton)

*1: Problems and warnings that occur during the cycle are displayed simply.

For details, see the output examples in the software manual.

*2: The data processing on the personal computer (display, printing, saving, etc.) is independent from the other data in the cycle data, and is handled as spare signal input data.

ENGINE ON/OFF DATA

When the engine is started or stopped, these data are recorded in RAM.
 The maximum limit for engine ON/OFF data is 115 sets of ON/OFF.

Item	Unit	Range	
Engine operation No.	Integer	1 - 65535	Consecutive numbers for engine operation (*1)
Year (last 2 digits)	Year	0 - 99	Shows when engine was switched ON
Month	Month	1 - 12	
Day	Day	1 - 31	
Time Hour	Hour	0 - 23	
Time Min	Minute	0 - 59	
Year (last 2 digits)	Year	0 - 99	Shows when engine was switched OFF
Month	Month	1 - 12	
Day	Day	1 - 31	
Time Hour	Hour	0 - 23	
Time Min	Minute	0 - 59	
Total payload	MT or ST	0 - 9999000	Total payload from time engine was switched ON to time engine was switched OFF
Overall number of cycles	Times	0 - 9999	

(MT: Metric Ton; ST: Short Ton)

*1: Every time the engine is switched ON, the engine operation No. advances by one, and is recorded. The engine operation No. in the cycle data and the engine operation No. in the problem/warning data, which are recorded from the time the engine is switched ON to the time it is switched OFF, are all recorded as an equal value. As a result, when using a personal computer later to compile the data, it is possible to determine what time during the engine operation the cycle data or system problem refers to.

PROBLEM, WARNING DATA

When a problem or warning occurs or is restored in the payload meter system, these data are recorded in RAM. The maximum limit for problem/warning data is 230 sets of occur/restore.

Item	Unit	Range	
Error code	-		See section on "PROBLEM AND WARNING DISPLAY (ERROR CODE)(6-75 PAGE)".
Engine operation No. when occurred	Integer	0 - 65535	(*1)
Number of times of occurrence since engine was switched ON	Times	1 - 255	
Year (last 2 digits)	Year	0 - 99] See section on problem/warning display (error code)
Month	Month	1 - 12	
Day	Day	1 - 31	
Time Hour	Hour	0 - 23	
Time Min	Minute	0 - 59	
Engine operation No. when restored	Integer	0 - 65535	(*2)
Year (last 2 digits)	Year	0 - 99] Shows when problem restored
Month	Month	1 - 12	
Day	Day	1 - 31	
Time Hour	Hour	0 - 23	
Time Min	Minute	0 - 59	

*1 *2: Every time the engine is switched ON, the engine operation No. advances by one, and is recorded. The engine operation No. in the cycle data and the engine operation No. in the problem/warning data, which are recorded from the time the engine is switched ON to the time it is switched OFF, are all recorded as an equal value. As a result, when using our personal computer later to compile the data, it is possible to determine what time during the engine operation the cycle data or system problem refers to.

When the engine operation No. is 0, it shows that the problem occurred or was restored when only the power was ON (starting switch key turned to ON), and the engine was not started.

TOTAL PAYLOAD, OVERALL NUMBER OF CYCLES DATA

- The total payload and overall number of cycles from any desired time are calculated and are recorded with each act of dumping.
- The calculation of both values is started from the point where the ZERO CLEAR switch is pressed for the total payload and overall number of cycles.
- Both total values can be displayed on the monitor panel by the using the operation given in "FORCED DISPLAY OF TOTAL PAYLOAD AND OVERALL NUMBER OF CYCLES (PAGE 6-54)". (See the same section for details of the method for ZERO CLEAR.)
The total payload is also displayed automatically when dumping.
- The maximum limit that can be recorded for the total payload and overall number of cycles is 999900.0 metric tons or short tons, and 9999 cycles.

Item	Unit	Range	
Total payload	MT or ST	0 - 999900.0] This shows the total value from the zero clear point Data and time shows time of zero clear operation
Overall number of cycles	Times	0 - 9999	
Year (last 2 digits)	Year	0 - 99	
Month	Month	1 - 12	
Day	Day	1 - 31	
Time Hour	Hour	0 - 23	
Time Min	Minute	0 - 59	

(MT: Metric Ton; ST: Short Ton)

OTHER DATA

Content	Item	Unit	Range	
Set data for operator check mode	Machine ID	Integer	0 - 200] Set using switch input operation For details, see section on operator check mode
	Open ID	Integer	0 - 200	
	Speed limit	km/h	0 - 99	
	Option code	Integer	0 - 11	
Calibration data	Year (last 2 digits)	Year	0 - 99] Data and time when calibration was carried out
	Month	Month	1 - 12	
	Day	Day	1 - 31	
	Time Hour	Hour	0 - 23	
	Time Min	Minute	0 - 59	
Data written by user	Data 1	-	20 characters] Comments which can be written freely to the payload meter. However, they can only be input using the cable communications from the personal computer. (See the software manual.)
	Data 2	-	20 characters	
	Data 3	-	20 characters	
	Data 4	-	20 characters	

OPERATION OF SWITCHES

By operating the switches on the payload meter, it is possible to force the following operations.

- "CARRYING OUT CALIBRATION (PAGE 6-53)"
- "FORCED DISPLAY OF TOTAL PAYLOAD AND OVERALL NUMBER OF CYCLES (PAGE 6-54)"
"FORCED DISPLAY OF PROBLEMS, WARNINGS WHEN THEY HAVE OCCURRED (PAGE 6-54)"
- "OPERATOR CHECK MODE (PAGE 6-56)"
 - (a) Memory card dump operation
 - (b) Data all clear operation
 - (c) Display of existing problems/warnings/restore status, status of input signals
 - (d) Machine ID setting
 - (e) Open ID setting
 - (f) Speed limit setting
 - (g) Option code setting
 - (h) Adjusting time, date
- "DIMMING LIGHTS ON MONITOR DISPLAY (PAGE 6-71)"
- "ADJUSTING BUZZER SOUND LEVEL (PAGE 6-71)"
- "SETTING MASS UNIT (SELECTING METRIC TON OR SHORT TON) (PAGE 6-71)"
- "SETTING FORCED PROHIBITION FOR SWITCHES (PAGE 6-72)"
- "SERVICE CHECK MODE (PAGE 6-73)"

CARRYING OUT CALIBRATION

WHEN CARRYING OUT CALIBRATION

NOTICE

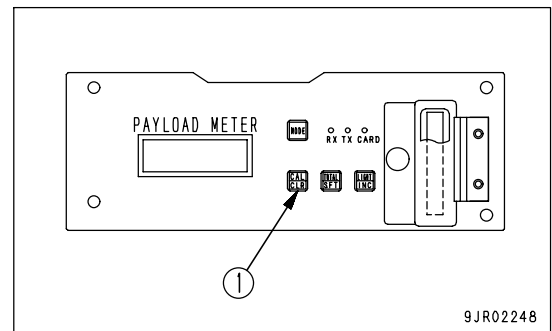
Carry out calibration in the following cases.

- When delivering the machine, and once a month after that.
- When the oil and gas pressure for the suspension cylinder has been adjusted. (When the suspension is adjusted.)
- When the chassis has been modified and the mass of the machine when empty has changed more than 100 kilograms.
- When the suspension pressure sensor has been replaced.
- When anything else has been done to suspension related parts.

When the condition of the machine as judged by the payload meter is different from the actual condition of the dump truck. (See the precautions for "DISPLAY DURING NORMAL OPERATIONS (PAGE 6-42)".)

METHOD OF CARRYING OUT CALIBRATION (METHOD OF OPERATION)

1. Empty the dump body. When doing this, remove all the mud that is stuck to the dump body.
2. Move the gearshift lever to the N position and keep CAL/CLR switch (1) pressed for at least 2 seconds. (The letters CAL flash)
3. Drive the machine, and when the travel speed reaches 10 km/h (6.2 MPH), press CAL/CLR switch (1). In this condition, continue to drive the machine, and if the display changes to the time display after approx. 30 seconds, the procedure is completed.
4. Move the machine to a safe place and stop the engine.
5. Start the engine again.
6. Move the dump lever as follows: FLOAT -> RAISE -> LOWER -> FLOAT.



Steps 4 to 6 are additional items to perform when installing new parts, but carry out these steps also to ensure accuracy.

NOTICE

- Carry out this operation on flat, level ground.
- Travel in a straight line. (Distance: approx. 100 m (328 ft 1 in))
- When traveling, keep the travel speed to a range of 5 to 10 km/h (3.1 to 6.2 MPH).
The calibration data is stored in the RAM, and is retained even if the power is switched OFF.
- If you want to stop calibration during the operation, when the letters CAL in Step 2 are flashing, press CAL/CLR switch (1) and the display will change from a flashing CAL to a flashing SCH. Press CAL/CLR switch (1) again and the display will return to the normal display.

During the normal operation display, calibration can be carried out when the dump lever is at the FLOAT position.

However, if any errors have occurred on the machine, for some of the errors, it may be impossible to carry out calibration. For details, see "PROBLEM AND WARNING DISPLAY (ERROR CODE) (PAGE 6-75)".

FORCED DISPLAY OF TOTAL PAYLOAD AND OVERALL NUMBER OF CYCLES

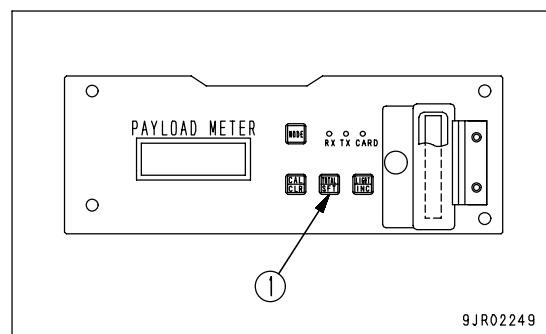
FORCED DISPLAY OF PROBLEMS, WARNINGS WHEN THEY HAVE OCCURRED

- The payload meter displays the total payload when the load is dumped, but it is also possible to use the following operation to display the total payload and overall number of cycles.
- For the total payload and overall number of cycles, each time the load is dumped, its weight is added. Furthermore, it is possible to clear this figure and return the total to 0 at any time. However, when this operation is carried out, if any problem or warning has occurred, the error code for that problem or warning is displayed in turn. (During normal operation, only the item with the highest priority is displayed.)

Method for forced display operation

The forced display of the total payload and overall number of cycles, clear, and forced display of the warning codes during occurrence can only be carried out if the dump lever is at the FLOAT position during the normal operation display.

If any new problem or warning should occur during the display, the system will return automatically to the display during normal operation when this happens.



1. Press TOTAL/SFT switch (1).

2. If no problems or warnings are occurring at present

The total payload is displayed (100 t units, rounded to the nearest 100 t) (lights up).

1) Press TOTAL/SFT switch (1) again.

The overall number of cycles is displayed. (Unit: times) (lights up)

2) Press TOTAL/SFT switch (1) again.

":" is displayed (lights up) for 2 seconds, then the display returns to the display for normal operation.

3. If problems or warnings are occurring at present

The error code is displayed. (Flashes)

1) Press TOTAL/SFT switch (1) again.

If any other problem or warning is occurring at present, the next error code is displayed. (Flashes)

2) Press TOTAL/SFT switch (1) again.

If no other problem or warning is occurring at present, ":" is displayed (flashes) for 2 seconds, then the display returns to the normal operation display.

It is possible to clear all the data for total payload and overall number of cycles whenever desired.

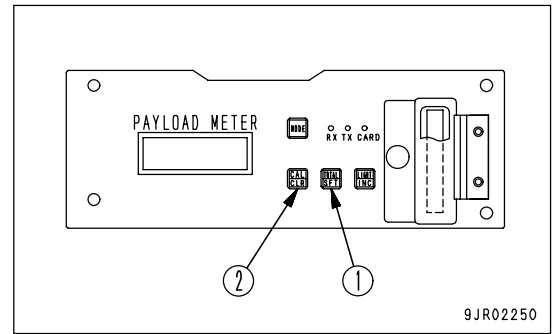
After the values are cleared, the total payload and overall number of cycles are calculated again from 0.

REMARK

Before clearing the data, download the necessary data for the total payload and overall number of cycles to a personal computer or save the data to the memory card.

Method of clearing total payload and overall number of cycles

1. Press TOTAL/SFT switch (1) to display the total payload and overall number of cycles.
2. Keep CAL/CLR switch (2) pressed for at least 2 seconds.
The total payload or overall number of cycles display will flash.
3. Keep CAL/CLR switch (2) pressed again for at least 2 seconds.
After "0000" is displayed for 2 seconds, if the display returns to the normal operation display, the zero clear operation is completed.

**REMARK**

- The zero clear operation for the total load and overall number of cycles is carried out at the same time. It is impossible to carry out the zero clear operation individually for only one of these items.
- The maximum limit for the total payload and overall number of cycles is as follows.
Total payload: 999900.0 t
Overall number of cycles: 9999 times
- If either the total payload or overall number of cycles goes above the set value, error code [H: FUL] is displayed.
- Carry out the zero clear operation for the total payload and overall number of cycles before error code [H:FUL] is displayed.
- If either the total payload or overall number of cycles exceeds the maximum limit, both values will be automatically cleared.
- Once error code [H:FUL] is displayed, it is impossible to forcibly clear the data or cancel the display until the value exceeds the limit and the data are automatically cleared.

OPERATOR CHECK MODE

By using the operator check mode, it is possible to forcibly display, set, or correct the following.

(a) Memory card dump

The data stored in the payload meter is written en bloc to the memory card installed in the payload meter.

REMARK

This function only works when switch No. 5 (memory card switch) on the left side face of the controller is set to "used".

(b) Data all clear

This forcibly erases all the cycle data, engine ON/OFF data, and problem and warning data.

The data for total payload and overall number of cycles are not cleared. For details, see "Method of clearing total payload and overall number of cycles (PAGE 6-55)".

REMARK

Before clearing the data, download the necessary data to a personal computer or carry out (a) Memory card dump.

(c) Display of existing problems/warnings/restore status, status of input signals

This distinguishes between problems and warnings that are now occurring and problems and warnings that have occurred in the past and have been restored to normal, and automatically displays the error code.

It also partially displays the condition of the signals from the sensors that are input to the payload meter.

(d) Machine ID setting

This is used when inputting, correcting, or setting the dump truck ID.

Available range for setting: 0 - 200

REMARK

There is no particular effect on the function of the payload meter if this is not set, but when using cable communications with the personal computer, communications cannot be carried out if the machine ID is not the same as the machine ID set in the personal computer.

(e) Open ID setting

This is used when inputting, correcting, or setting the desired ID.

Available range for setting: 0 - 200

There is no particular effect on the function of the payload meter if this is not set.

[Example of use of open ID]

Number to indicate location of work face

Operator ID number

(f) Speed limit setting

If there is a speed limit on the road that the dump truck uses, it is possible to display a warning on the payload meter if the dump truck exceeds that speed. This function is used when inputting, correcting, or setting the speed limit.

Available range for setting: 10 - 99 [km/h]

If the speed limit warning is not needed, set it to 99.

(g) Option code setting

This is used when inputting, correcting, or setting the options to give the desired baud rate for the cable communications function (RS-232C), ON/OFF for the PMC and TALKS (if equipped), and ON/OFF for the automatic transmission function. The code can be set as shown in the table below.

Option code	Communications baud rate (bit/sec)	Automatic transmission function	Option setting		
			TALKS setting	PMC setting	Data transmission type when completing dumping (when PMC is set)
0	9600	NO	NO	NO	-
1	9600	YES	NO	NO	-
2	1200	NO	NO	NO	-
3	1200	YES	NO	NO	-
4	9600	NO	YES	NO	-
5	9600	YES	YES	NO	-
6	1200	NO	YES	NO	-
7	1200	YES	YES	NO	-
8	9600	NO	YES	YES	Z1
9	9600	NO	YES	YES	Z2
10	9600	NO	NO	YES	Z1
11	9600	NO	NO	YES	Z2

NOTICE

When sending (downloading) the data stored in the payload meter to the personal computer using a communications cable, always set the option code to 0 or 2 before starting. (When PMC or TALKS are installed, set the option code to a number between 4 and 11.)

We recommend that you normally set the option code to 0.

(h) Adjusting time, date

Use this to set the time and date on the payload meter.

Of the functions in the operator check mode, the following can also be set from the personal computer using the personal computer download software supplied by Komatsu.

- Machine ID setting
- Open ID setting
- Speed limit setting
- Option code setting

Note that the option codes can only be changed from 0 to 2, from 4 to 6, or from 6 to 4.

- Adjusting time, date

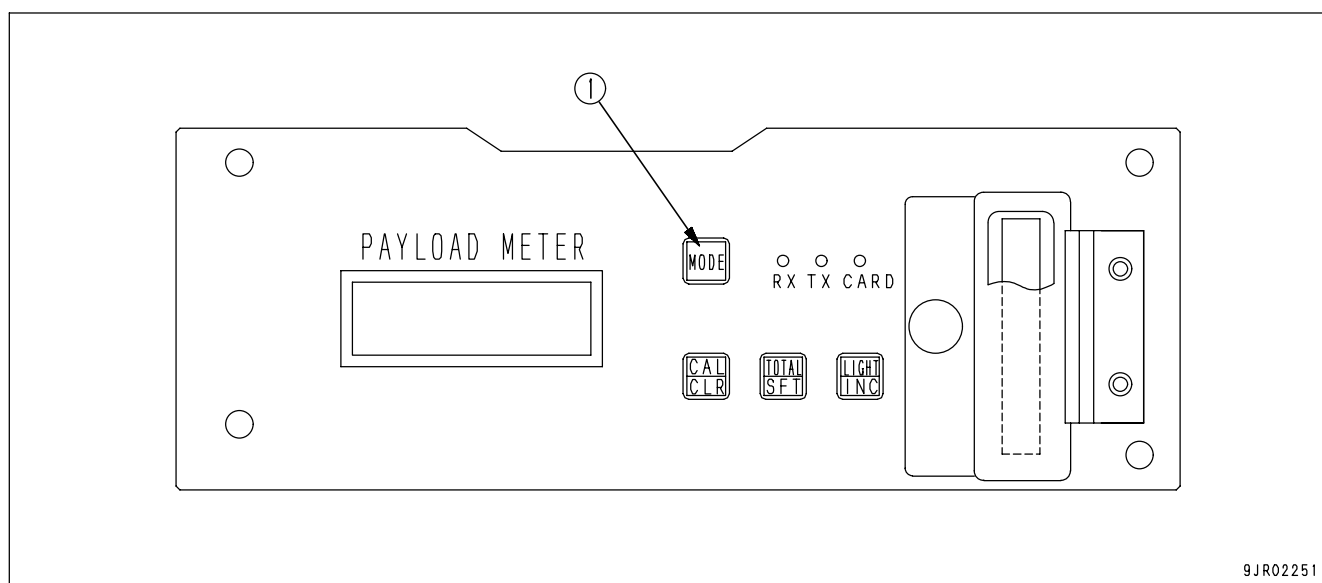
For details, see the software manual.

METHOD OF OPERATION

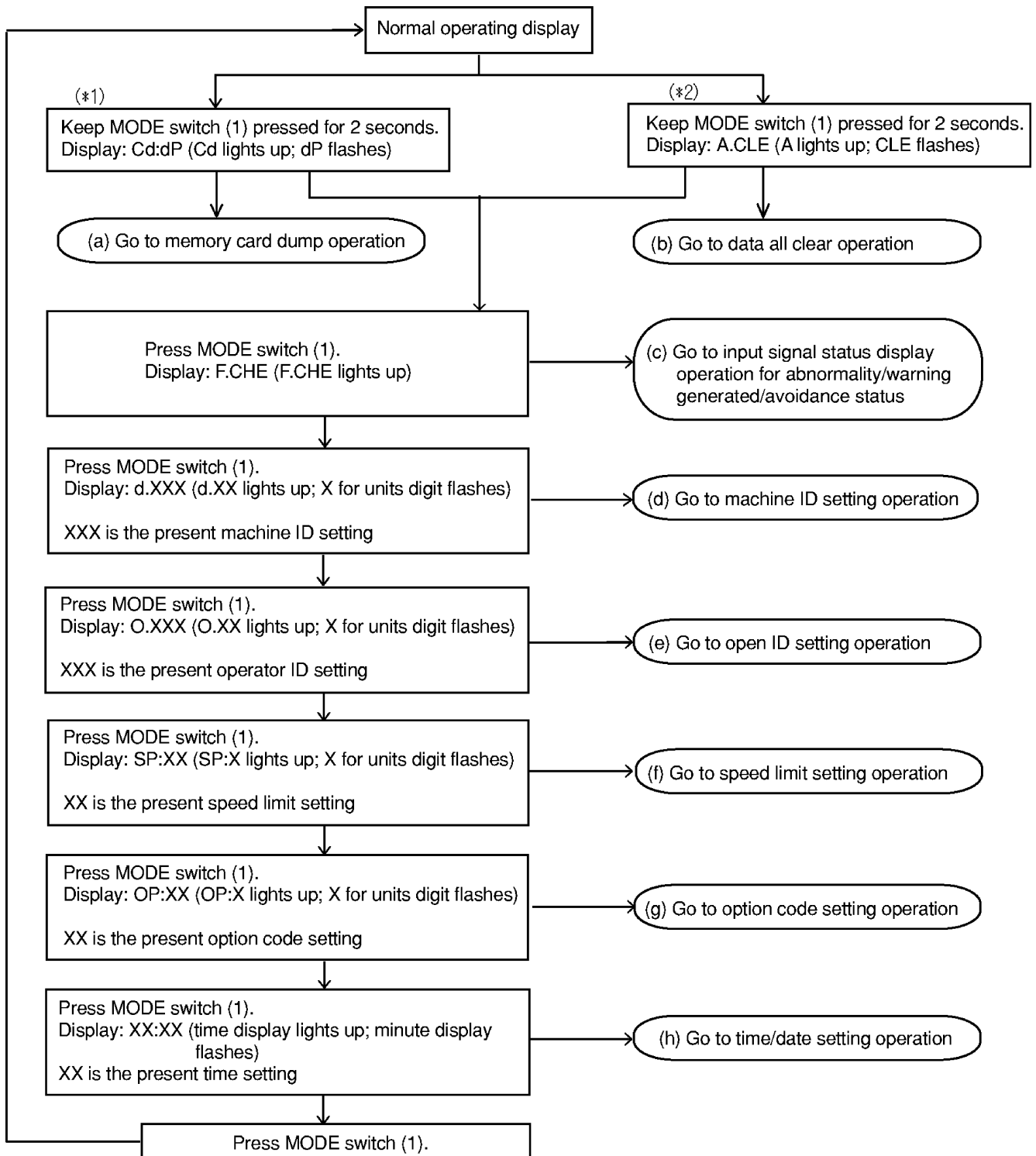
The operator check mode is actuated when the dump lever is at the FLOAT position and the gearshift lever is at the N position during display for normal operations. However, it does not work during the period from the start of the loading operation to completion of the loading operation.

NOTICE

To operate the operator check mode, set the gearshift lever to the N position and the dump lever to the FLOAT position. If the levers are operated to any other position, the payload meter will return to the normal operation display, but the content set and input in the operator check mode may not be properly processed.



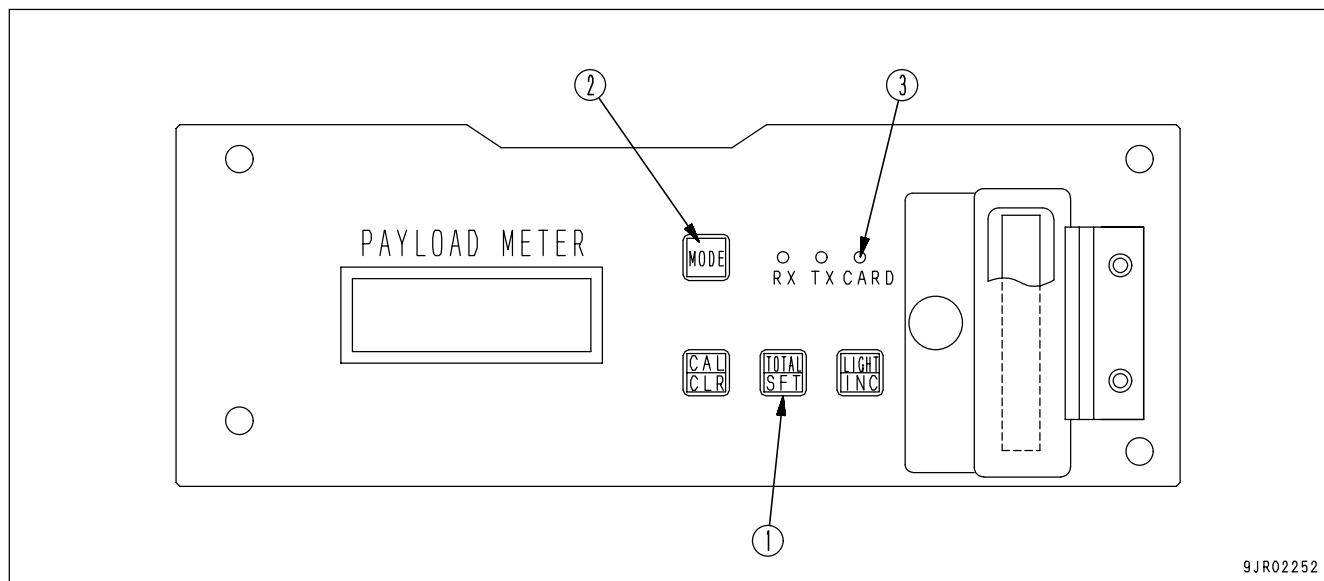
In the operator check mode, press MODE switch (1) to change the item. When the MODE switch (1) is pressed at the final item (time, date), it will return to the normal operation display.



*1: This is actuated only when switch No. 5 (memory card switch) on the left side face of the controller is set to "used".

*2: This is actuated only when switch No. 5 (memory card switch) on the left side face of the controller is set to "not used".

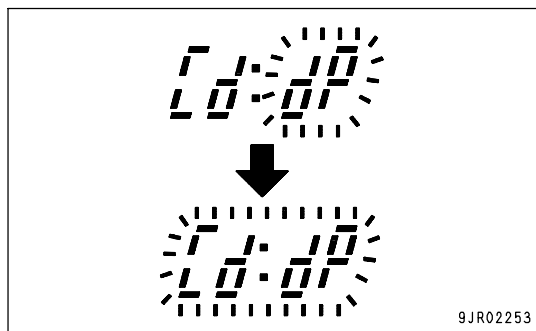
(a) Memory card dump operation



1. When the display is Cd:dP (Cd lights up, dP flashes), press TOTAL/SFT switch (1). The lighted up Cd display will change and start flashing.

REMARK

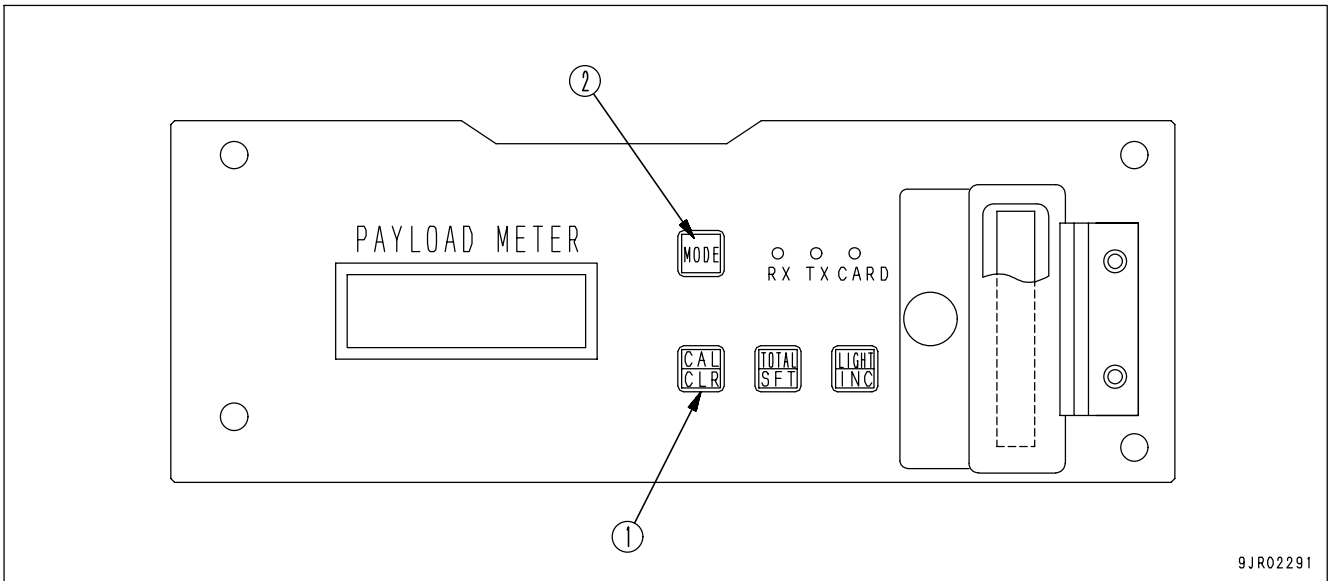
If you wish to stop the memory card dump operation when the display is Cd:dP (both Cd and dP are flashing), press MODE switch (2). The memory card dump operation is not carried out, and the display returns to the normal operation display.



2. Press TOTAL/SFT switch (1) again.
 The panel display goes out and memory card access lamp (3) lights up.
 When the memory card dump operation is completed, it automatically returns to the normal operation display.

The memory card dump function works only when switch No. 5 (memory card switch) on the left side face of the controller is set to "used".

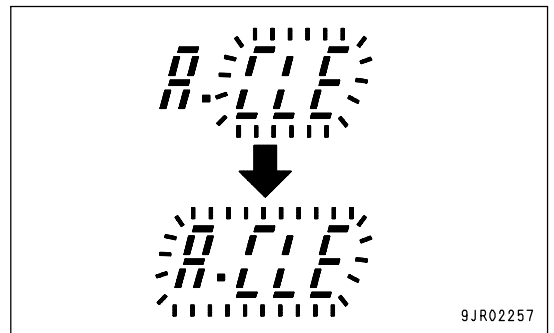
(b) Data all clear operation



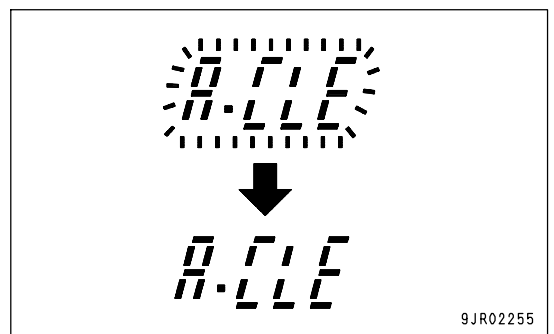
1. When the display is A.CLE (A lights up, CLE flashes), keep CAL/CLR switch (1) pressed for at least 2 seconds. The lighted up A display will change and start flashing.

REMARK

If you wish to stop the data all clear operation when the display is A.CLE (both A and CLE are flashing), press MODE switch (2). The data all clear operation is not carried out, and the display returns to the normal operation display.

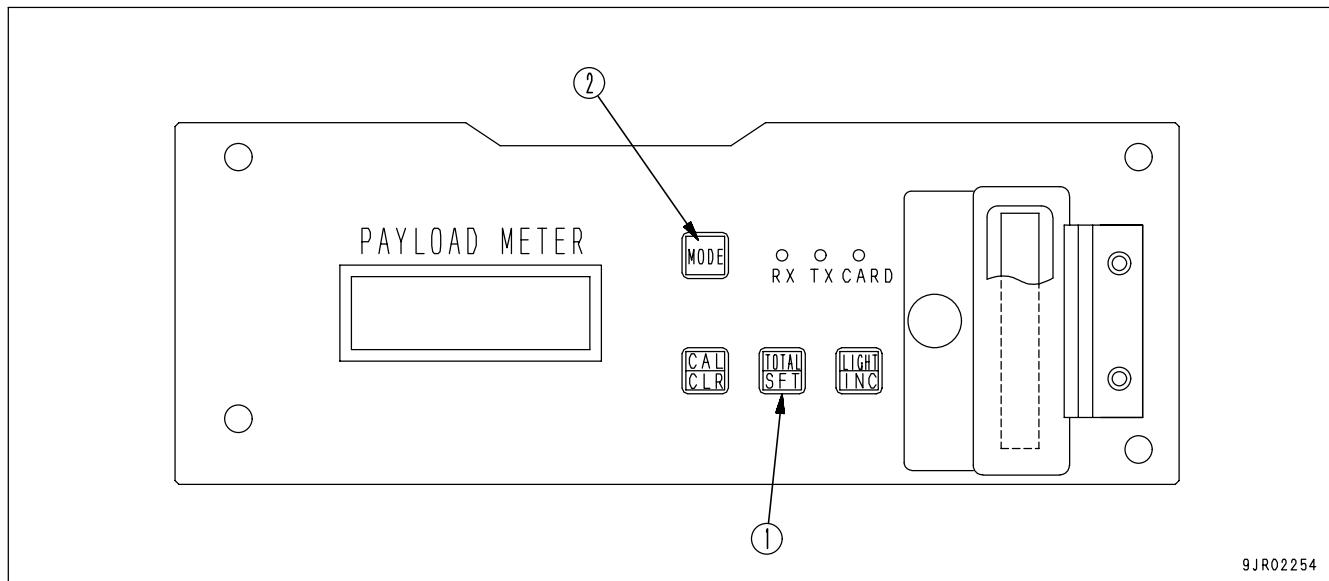


2. Keep CAL/CLR switch (1) pressed again for at least 2 seconds.
A.CLE lights up, and when the data clear operation is completed, the display automatically returns to the normal operation display.



REMARK

Before clearing the data, download the necessary data to a personal computer or carry out (a) Memory card dump operation.

(c) Display of existing problems/warnings/restore status, status of input signals

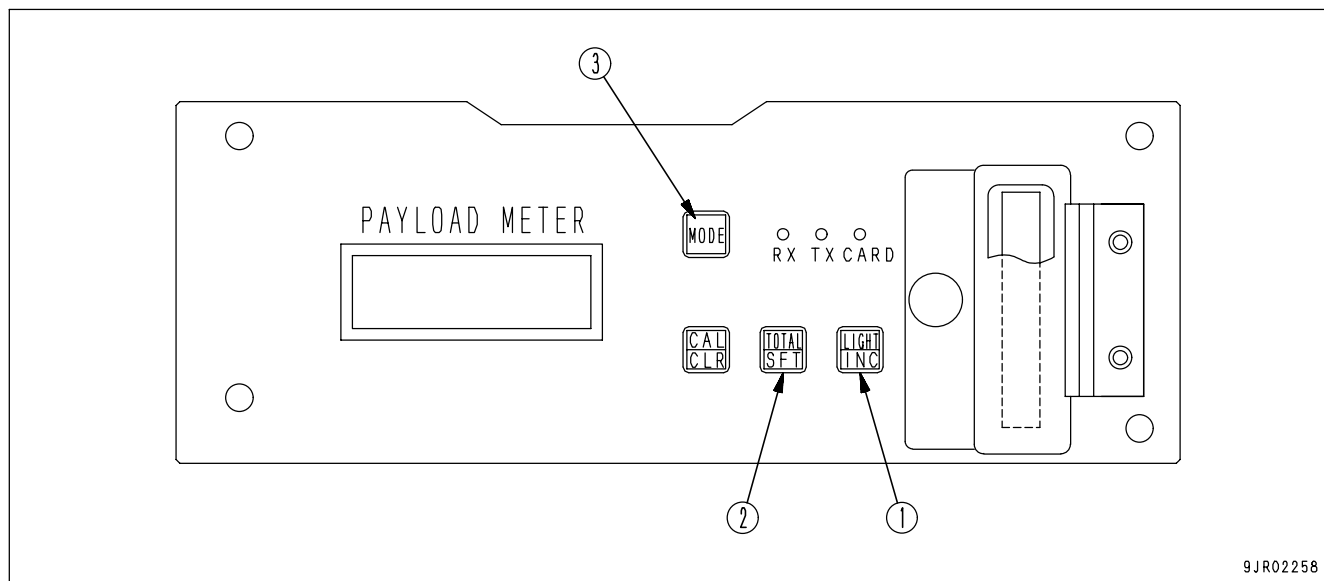
1. When the display is F.CHE (flashing), press TOTAL/SFT switch (1). The existing problems or warnings will be shown as follows.
 - 1) If there are no existing problems or warnings, F.--- (flashing for 6 sec.) is displayed.
 - 2) If there are any existing problems or warnings, The error codes are displayed in turn. (The error codes flash for 6 sec. each.)

2. The system will then automatically proceed to the following display for problems and warnings that have occurred in the past.
 - 1) If no problems or warnings have occurred in the past (there is no record of occurrence or restoration in the payload meter), F.--- (flashing for 3 sec.) is displayed.
 - 2) If any problems or warnings have occurred in the past, but the condition has now been restored, The error codes are displayed in turn. (The error codes flash for 3 sec. each.) After all the error codes for problems that occurred in the past have been displayed, F.--- (lights up for 3 sec.) is displayed.

3. The system will then automatically proceed to the following display for sensor signals input to the payload meter.
 - 1) Condition of signal for gearshift lever position
 Display: C1:XX (lights up for 3 sec.)
 "N": C1:oo
 Other than "N" : C1:--
 - 2) Condition of signal for dump lever position
 Display: C2:XX (lights up for 3 sec.)
 FLOAT: C2:oo
 Other than FLOAT: C2:--
 - 3) Condition of signal for engine oil pressure
 Display: C3:XX (lights up for 3 sec.)
 Engine running: C3:oo
 Engine stopped: C3:--

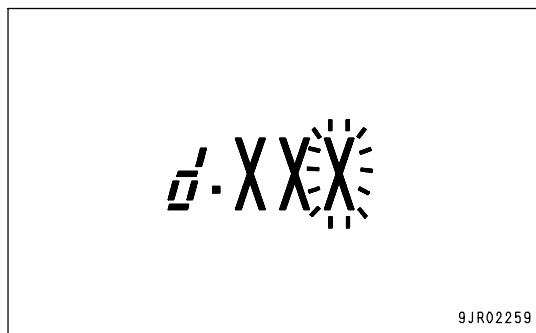
- 4) Condition of signal for battery charge
Display: C4:XX (lights up for 3 sec.)
Engine running: C4:oo
Engine stopped: C4:--
 - 5) Condition of signal for analog spare input 1
Display: C5:XX (lights up for 3 seconds)
XX: Input signal (V)
 - 6) Condition of signal for analog spare input 2
Display: C6:XX (lights up for 3 seconds)
XX: Input signal (V)
 - 7) Condition of signal for digital spare input 1
Display: C7:XX (lights up for 3 sec.)
Hi: C7:oo
Lo: C7:--
 - 8) Condition of signal for digital spare input 2
Display: C8:XX (lights up for 3 sec.)
Hi: C8:oo
Lo: C8:--
4. With the display for Step 3.8), press TOTAL/SFT switch (1) and return again to Step 1.1) or Step 1.2).
5. If MODE switch (2) is pressed at any time from the display following Step 1.1) or Step 1.2) up to Step 3.8), the display will return to the normal operation display.

(d) Machine ID setting



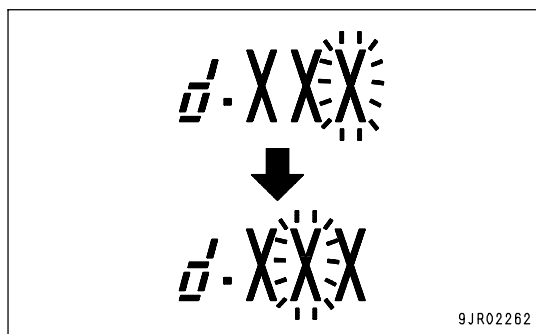
9JR02258

1. With the display at d.XXX (d.XX lights up, digit for units flashes), if it is necessary to correct the digit for the units, press LIGHT/INC switch (1) and correct the number.



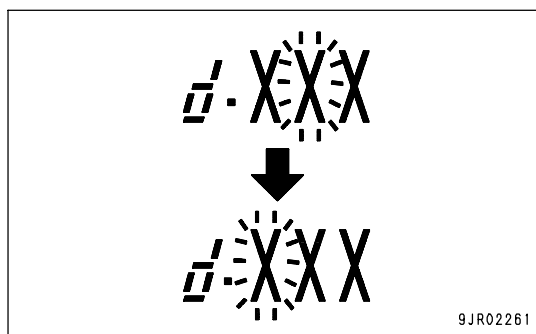
9JR02259

2. Press TOTAL/SFT switch (2).
The flashing digit in d.XXX moves one place to the left and it is possible to correct the digit for the tens.
If it is necessary to correct the digit for the tens, press LIGHT/INC switch (1) and correct the number.



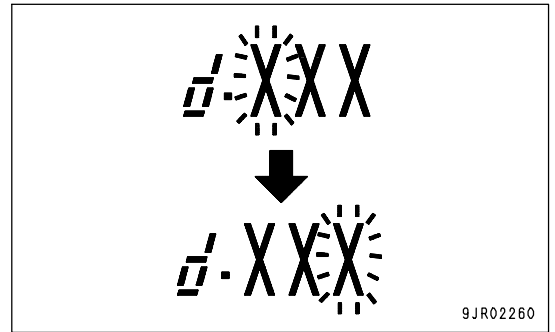
9JR02262

3. Press TOTAL/SFT switch (2).
The flashing digit in d.XXX moves one place to the left and it is possible to correct the digit for the hundreds.
If it is necessary to correct the digit for the hundreds, press LIGHT/INC switch (1) and correct the number.

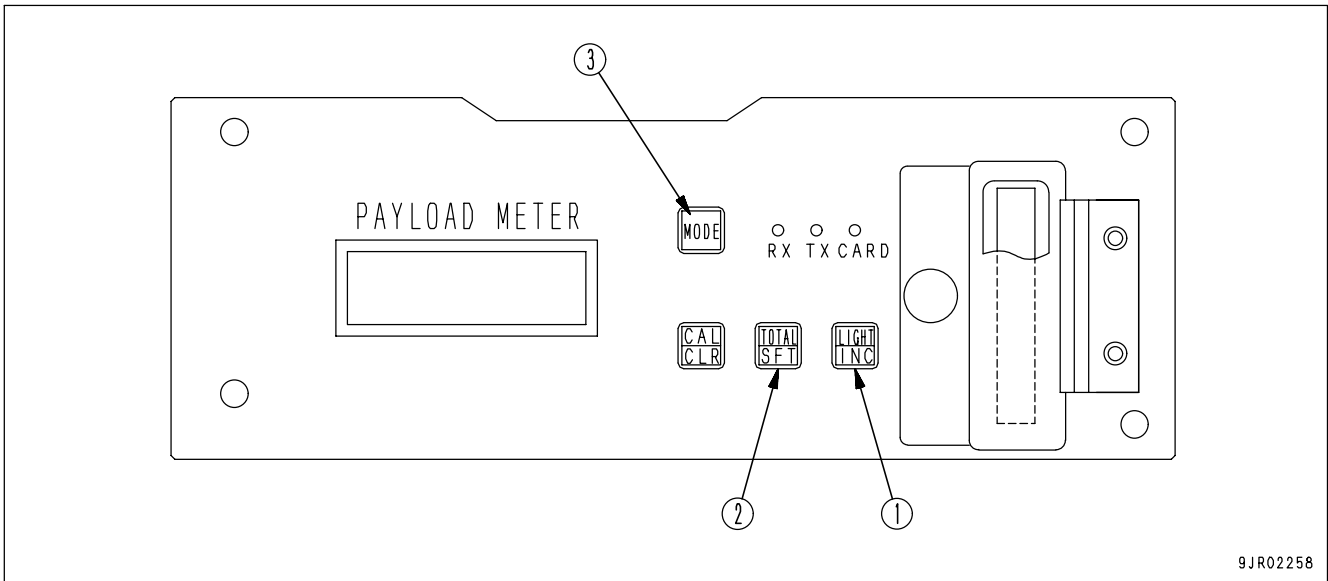


9JR02261

4. If TOTAL/SFT switch (2) is pressed again, the flashing digit will return to the digit for the units and it becomes possible to correct the units again.
5. After completing the correction of the Machine ID, press MODE switch (3). The display will return to the normal operation display.
If the number that has been input is not permitted, when MODE switch (3) is pressed, the display will return to Step 1.

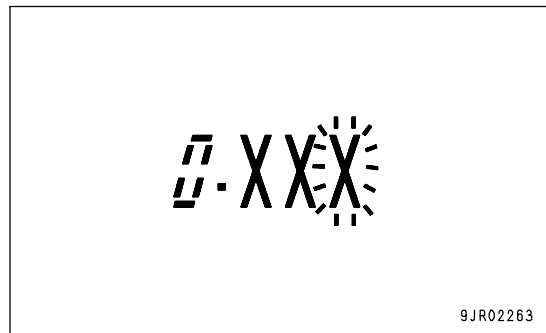


(e) Open ID setting



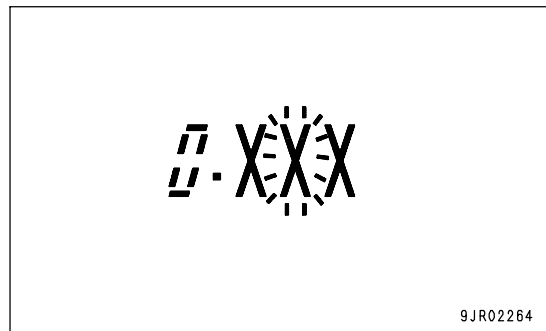
9JR02258

1. With the display at O.XXX (O.XX lights up, digit for units flashes), if it is necessary to correct the digit for the units, press LIGHT/INC switch (1) and correct the number.



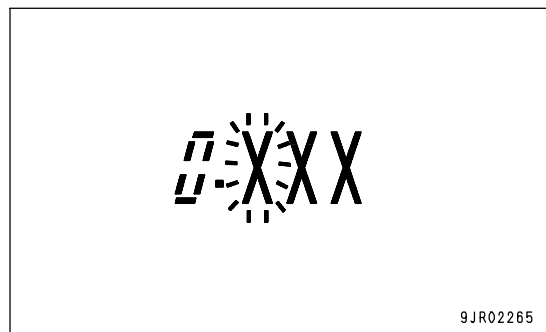
9JR02263

2. Press TOTAL/SFT switch (2).
The flashing digit in O.XXX moves one place to the left and it is possible to correct the digit for the tens.
If it is necessary to correct the digit for the tens, press LIGHT/INC switch (1) and correct the number.



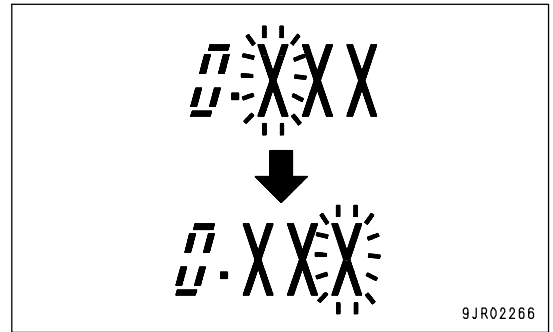
9JR02264

3. Press TOTAL/SFT switch (2).
The flashing digit in O.XXX moves one place to the left and it is possible to correct the digit for the hundreds.
If it is necessary to correct the digit for the hundreds, press LIGHT/INC switch (1) and correct the number.

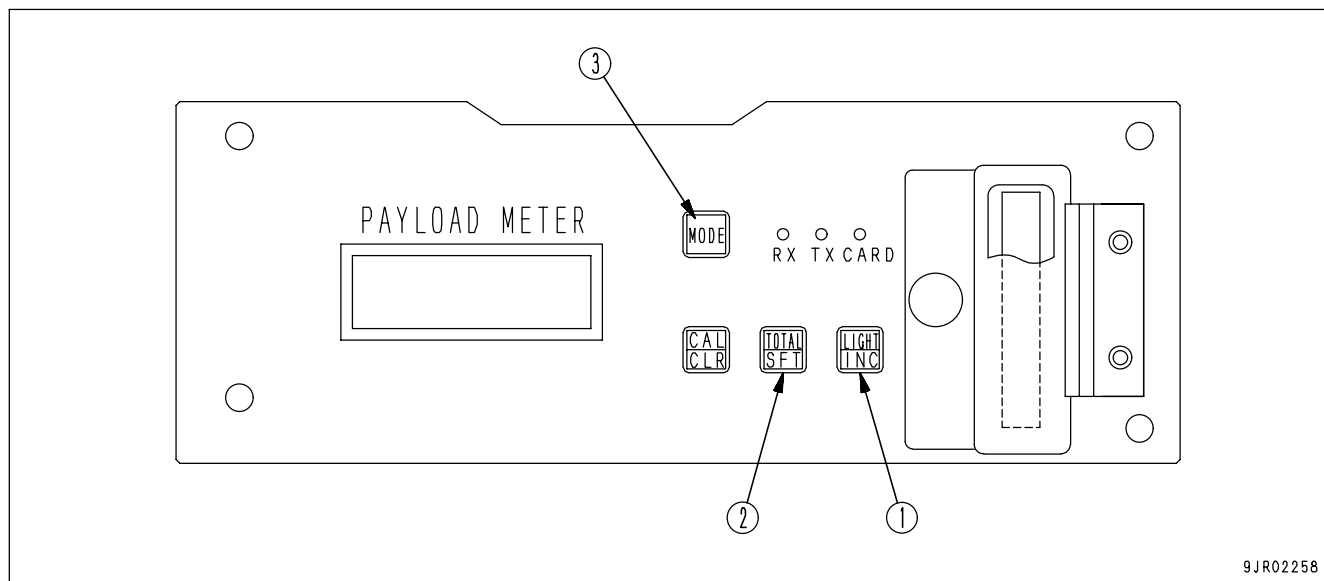


9JR02265

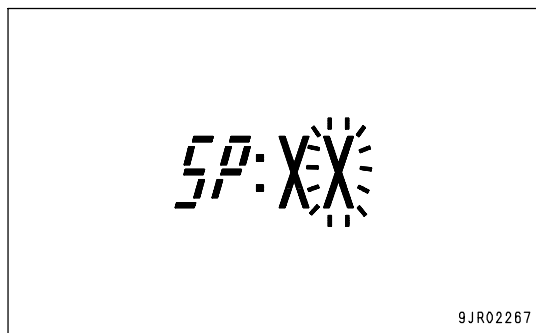
4. If TOTAL/SFT switch (2) is pressed again, the flashing digit will return to the digit for the units and it becomes possible to correct the units again.
5. After completing the correction of the Open ID, press MODE switch (3). The display will return to the normal operation display.
If the number that has been input is not permitted, when MODE switch (3) is pressed, the display will return to Step 1.



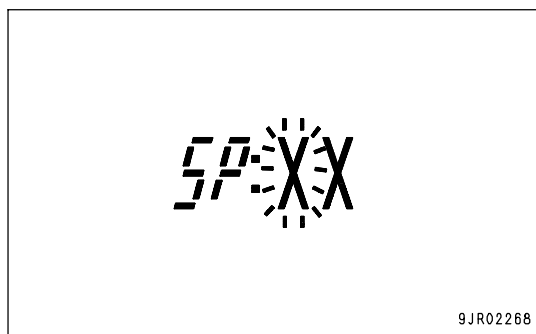
(f) Speed limit setting



1. With the display at SP.XX (SP.X lights up, digit for units flashes), if it is necessary to correct the digit for the units, press LIGHT/INC switch (1) and correct the number.

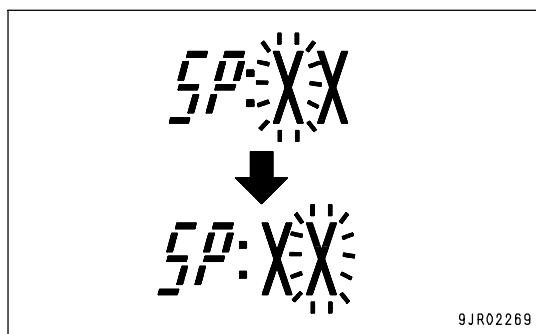


2. Press TOTAL/SFT switch (2). The flashing digit in SP.XX moves one place to the left and it is possible to correct the digit for the tens. If it is necessary to correct the digit for the tens, press LIGHT/INC switch (1) and correct the number.

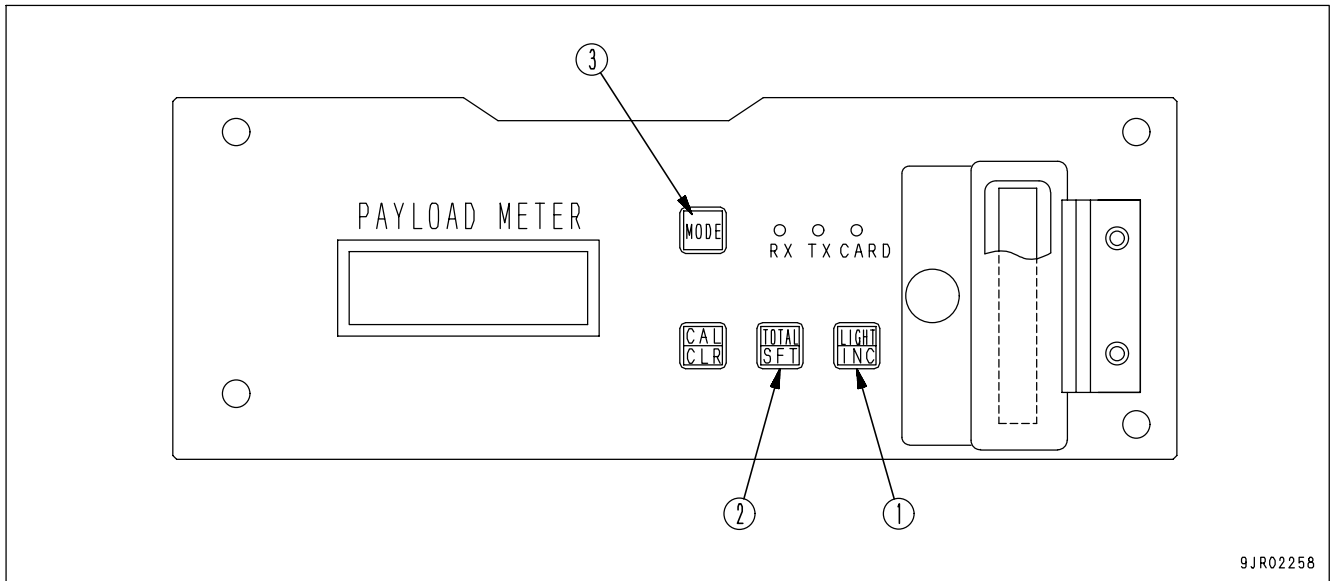


3. If TOTAL/SFT switch (2) is pressed again, the flashing digit will return to the digit for the units and it becomes possible to correct the units again.

4. After completing the correction of the Speed Limit, press MODE switch (3). The display will return to the normal operation display. If the number that has been input is not permitted, when MODE switch (3) is pressed, the display will return to Step 1.

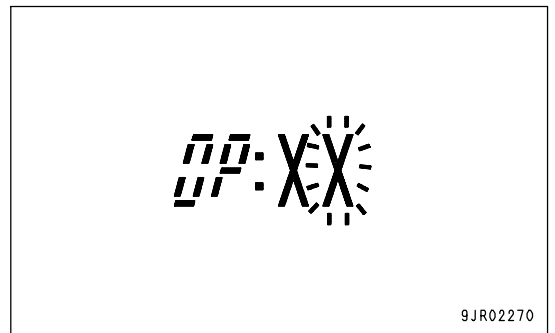


(g) Option code setting



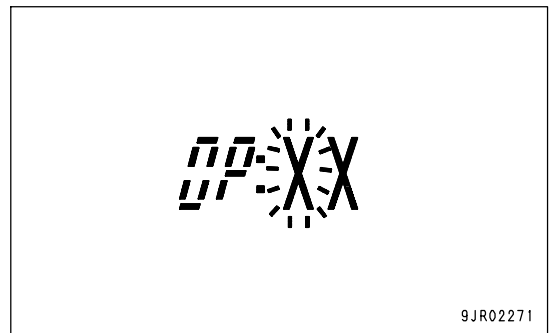
9JR02258

1. With the display at OP.XX (OP.X lights up, digit for units flashes), if it is necessary to correct the digit for the units, press LIGHT/INC switch (1) and correct the number.



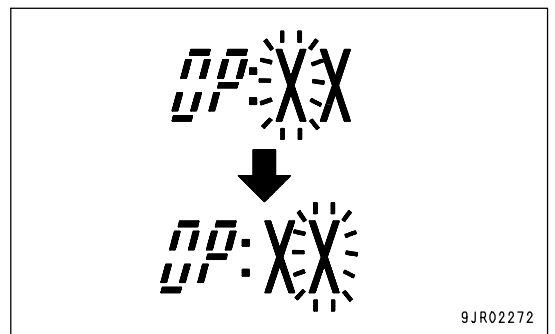
9JR02270

2. Press TOTAL/SFT switch (2).
The flashing digit in OP.XX moves one place to the left and it is possible to correct the digit for the tens.
If it is necessary to correct the digit for the tens, press LIGHT/INC switch (1) and correct the number.



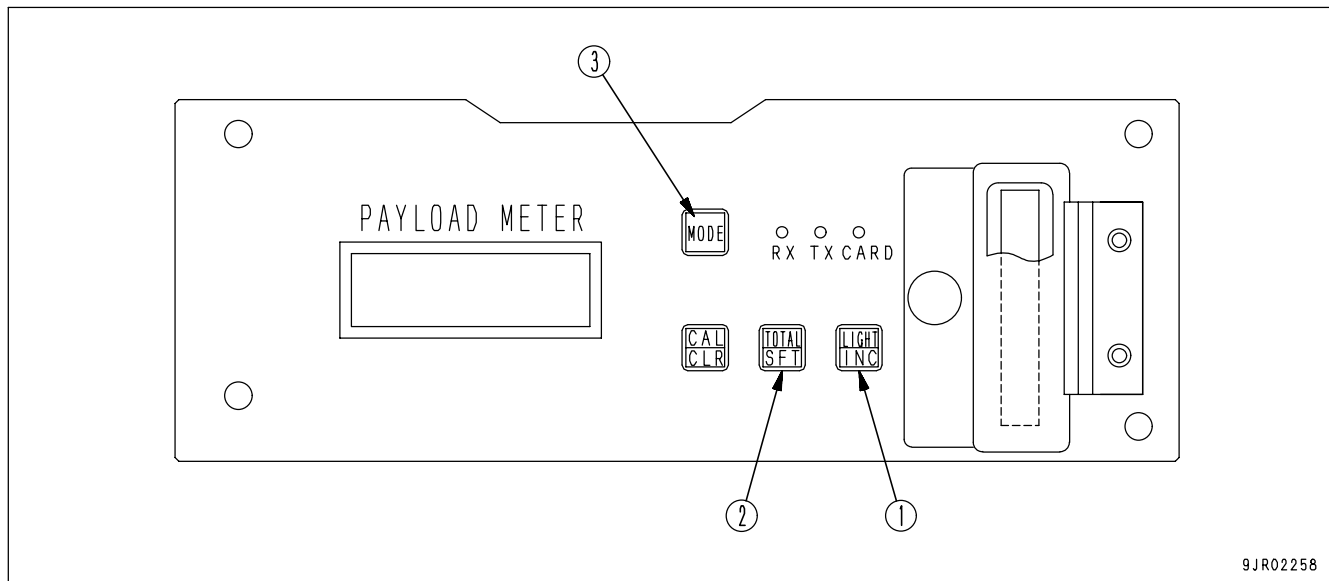
9JR02271

3. If TOTAL/SFT switch (2) is pressed again, the flashing digits will return to the digit for the units and it becomes possible to correct the units again.

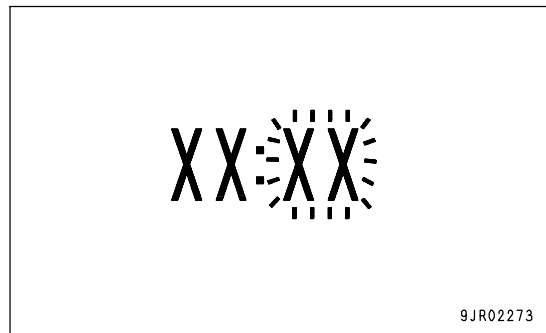


9JR02272

4. After completing the correction of the Option Code, press MODE switch (3). The display will return to the normal operation display.
If the number that has been input is not permitted, when MODE switch (3) is pressed, the display will return to Step 1.

(h) Adjusting time, date

1. With the display at XX.XX (Time display lights up, Minute display flashes), if it is necessary to correct the minute display, press LIGHT/INC switch (1) and correct the number.

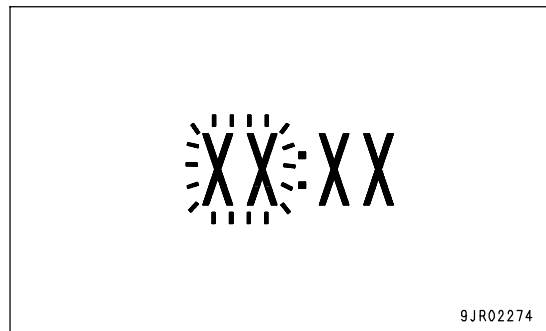


2. Press TOTAL/SFT switch (2).

The flashing location moves from the minute display to the hour display and it is possible to correct the hour display.

If it is necessary to correct the hour display, press LIGHT/INC switch (1) and correct the number.

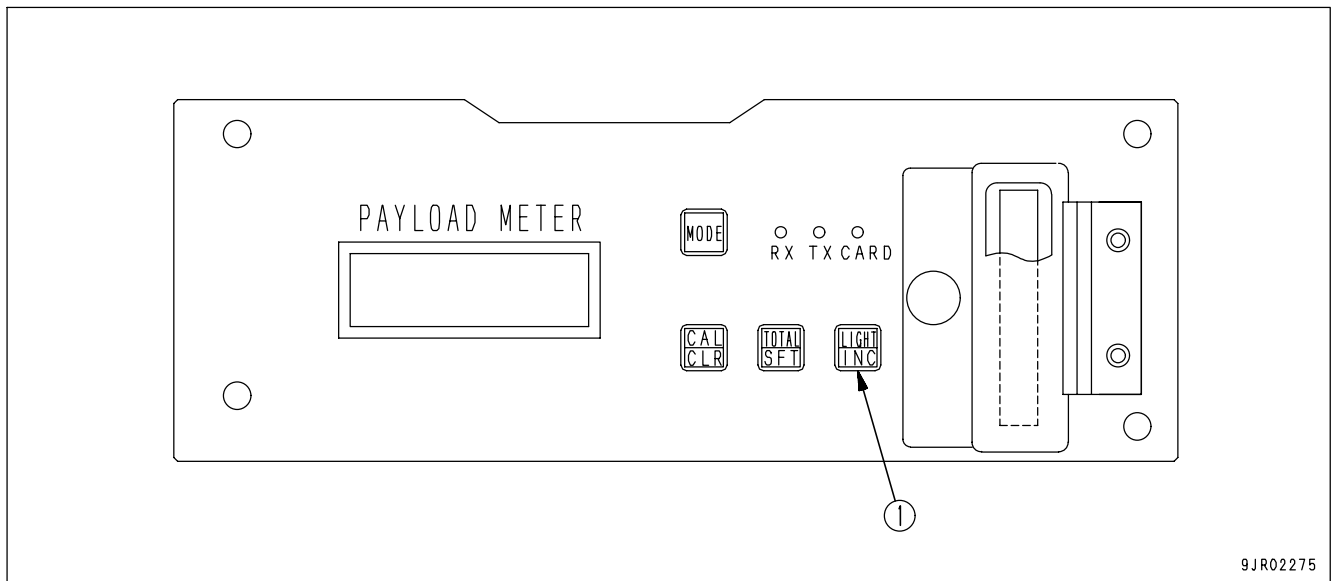
Display the time as a 24-hour clock.



3. Each time TOTAL/SFT switch (2) is pressed, the flashing location will change Day, Month, Year. If it is necessary to correct, press LIGHT/INC switch (1) and correct the number.

4. When the year display is flashing, if TOTAL/SFT switch (2) is pressed again, the flashing location will return to the minute display and it becomes possible to correct the minute display again.

5. After completing the correction of the time and date, press MODE switch (3). The display will return to the normal operation display.

DIMMING LIGHTS ON MONITOR DISPLAY

If you want to change the brightness of the monitor display, do as follows.

Press LIGHT/INC switch (1). Each time the switches pressed, the lighting will become one level darker; and if the switches pressed when that the lighting is darkest, it will return to the brightest level.

The brightness can be changed in ten stages.

If the switch is kept pressed, the brightness will change continuously.

ADJUSTING BUZZER SOUND LEVEL

For details, see "LEFT FACE OF CONTROLLER (PAGE 6-37)".

NOTICE

The switches on the left side are set when the machine is shipped from the factory.

Do not touch any switch except No. 7 and No. B.

If you wish to adjust any switch except No. 7 and No. B to compensate the payload calculation value or speed or distance calculation value, please contact your Komatsu distributor.

SETTING MASS UNIT (SELECTING METRIC TON OR SHORT TON)

For details, see "LEFT FACE OF CONTROLLER (PAGE 6-37)".

The payload display unit changes from the point where the setting for the mass unit is changed.

The values stored in the payload meter RAM will also have the unit changed for any data put into memory from the time the setting is changed.

Is not possible to convert units or data already stored in payload meter RAM, so before switching the units, we recommend that you download all the data to the personal computer or carry out the memory card dump.

NOTICE

The switches on the left side are set when the machine is shipped from the factory.

Do not touch any switch except No. 7 and No. B.

If you wish to adjust any switch except No. 7 and No. B to compensate the payload calculation value or speed or distance calculation value, please contact your Komatsu distributor.

SETTING FORCED PROHIBITION FOR SWITCHES

For details, see "LEFT FACE OF CONTROLLER (PAGE 6-37)".

In addition, when setting forced prohibition for the switches, please ask your Komatsu distributor.

SERVICE CHECK MODE

By operating the service check mode, it is possible to carry out display, setting, and correction forcibly of the following items.

If it is designed to correct the method of operation and setting, please ask your Komatsu distributor.

(a) Detailed display of calibration data

This display shows the data, suspension pressure, etc. for the latest calibration.

(b) Detailed display of payload calculation data (analog data)

The display shows the suspension pressure and machine angle when calculating the present payload.

(c) Memory card dump (service area)

This writes all the data displayed for (a) and (b) to the memory card installed in the body.

(d) Data all clear (service area)

This forcibly deletes (a) calibration data and (b) analog data, except for the latest calibration data.

(e) Input signal status display

This displays some of the signal status for the sensors input to the payload meter and the present recognition status display of the payload meter.

(f) Forced initialization

This forcibly deletes all the data in the payload meter.

(g) Extra payload setting when loading

The extra load for the payload can be forcibly input, corrected, or set when loading.

(h) Payload fixed display and cycle data recording, payload value setting

1. The payload fixed display

1) When TALKS is not set: Time that machine is stopped after traveling 160 m with at least 50% of set payload loaded until starting to dump

2) When TALKS is set: Time that machine is stopped from permission to move off until starting to dump

When displaying the payload in 1) or 2), it is possible to input, correct, or set the displayed payload and completion of loading (when traveling 160 m with at least 50% of the set payload loaded or when starting to dump), not the real-time payload.

2. Cycle data recording, switching payload value

If the payload fixed display in Item 1 above is applicable, this inputs, corrects, or sets the payload in the cycle data to the fixed display payload value.

(i) Setting loading completion recognition travel distance

This inputs, corrects, or sets the travel distance recognized as completion of loading by the payload meter.

(j) Setting loading start recognition payload

This inputs, corrects, or sets the payload recognized as the start of loading by the payload meter.

(k) Setting 0 ton display range

This inputs, corrects, or sets the range for the zero display on the payload display.

(l) Setting external display lamp display range

This inputs, corrects, or sets the payload range for the lamps to light up when displaying the payload.

Of the functions in the service check mode, the following can also be set from the personal computer using the personal computer download software supplied by Komatsu.

- Calibration data
- Payload calculation data (analog data)

PROBLEM AND WARNING DISPLAY (ERROR CODE)

The payload meter always carries out self-diagnosis of the system, and if any problem or warning occurs, it is displayed by the monitor panel and the external display lamps.

For details of the detection items and displays, see the problem and warning item table.

NOTICE

- If any problem or warning occurs, if it is within the timing possible for display, it is displayed on the monitor panel and the buzzer sounds for 3 seconds.
- If a problem or warning is currently being displayed, and another problem which has low priority for display occurs, if the timing possible for display overlaps, the newly occurring problem will be displayed and the buzzer will sound for 3 seconds. Following this, the problems and warnings will be displayed according to the timing possible for display. If the timing possible for display overlaps, the problem with the higher display priority in the chart is displayed.

Priority of display	Content	Judgment standard	Content of error code display			Timing possible for display	Recording of problem and warning data (display code for personal computer software)	Remarks								
			Panel display	External display lamps	Display canceled											
1	Dump lever not at FLOAT (except when dumping)	-	b-FL lights up	All flash	When problem is removed	Gearshift lever at N	-	-								
			b-FL lights up	-	When problem is removed				Gearshift lever at position other than N	-						
2	Memory card removed	-	Cd flashes	-	When problem is removed	Removal detection only for card dump	-	Detected only when card dump operation is run								
3	Drop in backup battery voltage	Defective contact or voltage below 2.7V	F-09 flashes	-	When problem is removed	Except when loading	Record (000-009)	Rated voltage: 3.6V								
									4	Cycle data memory FULL	See (*1)	Except when loading	Record (000-011)	-		
															Engine ON/OFF data memory FULL	(000-012)
															Problem, warning data memory FULL	(000-013)
Total payload, overall number of cycles data memory FULL	(000-014)															
5	Disconnection at R terminal	Output with the engine running is less than 2V	F-18 flashes	All flash	When problem is removed	When engine is running	Record (000-018)	-								
6	Problem in sensor power source (18V)	Output below 1.5V and power source voltage over 20V	F-20 flashes	All flash	When problem is removed	When normal	Record (000-020)	Calibration cannot be carried out when problem has occurred								

Priority of display	Content	Judgment standard	Content of error code display			Timing possible for display	Recording of problem and warning data (display code for personal computer software)	Remarks
			Panel display	External display lamps	Display canceled			
7	Short circuit or disconnection in front left suspension sensor system	Suspension pressure sensor input signal 0 kg/cm ² or below	F-21 flashes	All flash	When problem is removed	When normal	Record (000-021)	Calibration cannot be carried out when problem has occurred
			F-22 flashes					
			F-23 flashes					
			F-24 flashes					
8	Short circuit or disconnection in front right suspension sensor system	Suspension pressure sensor input signal 200 kg/cm ² or above	F-25 flashes	All flash	When problem is removed	When normal	Record (000-025)	Calibration cannot be carried out when problem has occurred
			F-26 flashes					
			F-27 flashes					
			F-28 flashes					
9	Short circuit or disconnection in rear left suspension sensor system	Suspension pressure sensor input signal 0 kg/cm ² or below	F-31 flashes	All flash	When problem is removed	When normal	Record (000-031)	Applicable only when clinometer switch is set to "used"
			F-32 flashes					
10	Short circuit or disconnection in rear right suspension sensor system	Suspension pressure sensor input signal 200 kg/cm ² or above	F-31 flashes	All flash	When problem is removed	When normal	Record (000-032)	Calibration cannot be carried out when problem has occurred
			F-32 flashes					
11	Short circuit or disconnection in clinometer system	Recorded data for calibration corrupted	F.CAL flashes	All flash	When problem is removed	When normal	Record (000-019)	Calculation of payload is stopped when problem has occurred

Priority of display	Content	Judgment standard	Content of error code display			Timing possible for display	Recording of problem and warning data (display code for personal computer software)	Remarks
			Panel display	External display lamps	Display canceled			
18	Short circuit in No. 1 relay for external display lamps	When coil continuity is ON, relay coil is short circuited with power source	F-41 flashes	See Remarks column	When problem is removed	Except when loading (see Remarks column for details of external display lamps)	Record (000-041)	External lamps are actuated as follows Applicable lamps Machine stopped: Always ON When traveling: OFF Other lamps When loading: Standard actuation When not loading Machine stopped: Flash When traveling: OFF
19	Short circuit in No. 2 relay for external display lamps		F-42 flashes				(000-042)	
20	Short circuit in No. 3 relay for external display lamps		F-43 flashes				(000-043)	
21	Short circuit in No. 4 relay for external display lamps		F-44 flashes				(000-044)	
22	Short circuit in No. 5 relay for external display lamps		F-45 flashes				(000-045)	
23	Defective payload for cycle data (*2)		See (*2)	L.bad flashes	-		Empty machine starts to travel	
24	Exceeding speed limit	Travel speed exceeds set speed limit	SP: SP flashes	-	Set value -2 km/h	When problem has occurred	-	
25	Defective communications or defective setting of option code		F-71 flashes F-73 flashes F-80 flashes F-81 flashes F-91 flashes F-92 flashes F-93 flashes F-94 flashes F-95 flashes F-96 flashes F-97 flashes F-98 flashes F-99 flashes	-	When problem is removed	-	Record (000-071) (000-073) (000-080) (000-081) (000-091) (000-092) (000-093) (000-094) (000-095) (000-096) (000-097) (000-098) (000-099)	

***1: Warning display when memory is full**

1. Cycle data

- 1) If more than 2600 cycles are recorded (less than 300 cycles remaining):

L: FUL flashes 7 times

: flashes 1 time

This is repeated.

- 2) If more than 2900 cycles are recorded (0 cycles remaining):

L: FUL lights up (3 sec.)

: flashes 1 time

This is repeated.

- 3) If more cycles are recorded, cycles 2901 and 2902 are recorded, but each time, the oldest cycle data is deleted in turn to make space to record the new cycle.

(The display stays the same as in condition 2.)

2. Engine ON/OFF data

- 1) If more than 105 sets are recorded (less than 10 sets remaining):

E: FUL flashes 7 times

: flashes 1 time

This is repeated 2 times, then the display goes out.

- 2) If more than 115 sets are recorded (0 sets remaining):

E: FUL lights up (3 sec.)

: flashes 1 time

This is repeated 2 times, then the display goes out.

- 3) If more sets are recorded, sets 116 and 117 are recorded, but each time, the oldest ON/OFF data is deleted in turn to make space to record the new set.

3. Problem and warning data

- 1) If more than 220 sets are recorded (less than 10 sets remaining):

F: FUL flashes 7 times (3 sec.)

: flashes 1 time

This is repeated.

- 2) If more than 230 sets are recorded (0 sets remaining):

F: FUL lights up (3 sec.)

: flashes 1 time

This is repeated.

- 3) If more problems or warnings are generated, sets 231 and 232 are recorded, but each time, the oldest problem and warning data are deleted in turn to make space to record the new set.

(The display stays the same as in condition 2.)

4. Data for total payload, overall number of cycles

1) If the overall number of cycles goes above 9994 (less than 5 times remaining) or the difference between the total payload recorded in memory and 999900 tons (maximum limit) is less than 5 times the rated payload:

H: FUL flashes 7 times (3 sec.)

: flashes

This is repeated.

2) If the overall number of cycles goes above 9997 (less than 2 times remaining) or the difference between the total payload recorded in memory and 999900 tons (maximum limit) is less than 2 times the rated payload:

H: FUL lights up (3 sec.)

: flashes 1 time

This is repeated.

3) If the overall number of cycles reaches 9999 times or the total payload exceeds 999900 tons, both the total payload and the overall number of cycles are cleared automatically. The data for both values are then calculated again from 0.

(The display returns to the normal operation display.)

5. To cancel the data FULL for Items 1 to 3, see "OPERATOR CHECK MODE (PAGE 6-56)". If data FULL is displayed for Item 4, it cannot be canceled until it is automatically cleared. Before the data FULL display appears, use the forced ZERO CLEAR to clear the data.

For details of the method of operation, see "FORCED DISPLAY OF TOTAL PAYLOAD AND OVERALL NUMBER OF CYCLES (PAGE 6-54)".

6. There is no order of priority for displays 1 to 4.

If multiple data 4 occur at the same time, they are displayed in order except during loading.

***2: Defective cycle data payload**

The payload meter carries out the detection of the payload based on the signal from the suspension pressure sensor. It is always carrying out this detection, but the result is somewhat inaccurate because of the dynamic friction of the suspension during loading and immediately after loading. To make the recorded payload more accurate, the payload meter records the payload by detecting the payload immediately before dumping, where the dynamic friction of the suspension while the machine is being loaded is canceled by traveling with the machine loaded, and this is written to the memory. (It is recorded as one part of the cycle data.)

For this reason, if the dumping operation (operation of the dump lever) is carried out while the chassis is still pitching after the machine is stopped at the dumping point, the payload sent to the payload meter memory may not be accurate.

In addition, if the dump truck is stopped at the dumping point by braking suddenly, or if it mounts the blocks used to stop the wheels, or hits something and stops, the payload that is sent to the memory may not be accurate.

If the load is dumped while the machine is still pitching as in the conditions given above, the payload meter will display "Defective cycle data payload" in than the chart of Problem and Warning Items to warn the operator. In this case, the detected payload is also written to memory.

NOTICE

- When stopping the machine at the dumping point, avoid braking suddenly, mounting rocks or the blocks used to stop the wheels, or hitting things.
- When operating the dumped lever to dumped the load, stop the machine at the dumping point and wait for the pitching to stop before operating the lever.
(As a guideline, wait for at least 3 sec after stopping the machine before operating the dumped lever.)
- Make the dumping point as horizontal as possible, and makes the unevenness of the travel path as small as possible.

WHEN ERROR CODE F-09 IS DISPLAYED (PROCEDURE FOR REPLACING BATTERY)

The payload meter has an internal battery to prevent the recorded data from being deleted when the key in the starting switch is turned to the OFF position.

If the voltage of the battery drops, F-09 is displayed as an error message, so replace the battery as follows.

REPLACING BATTERY



When replacing the battery, unload the machine and move it to a safe place.

- Parts to prepare
 - Crosshead screwdriver
 - New battery (581-86-55710)

NOTICE

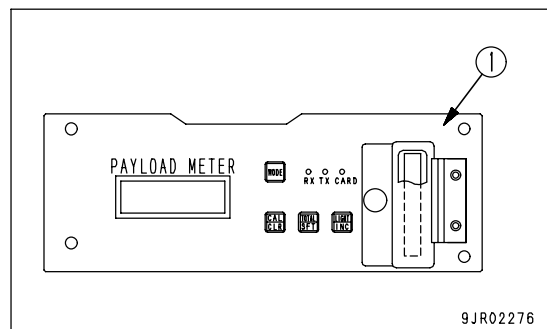
- Remove your gloves when carrying out the operation.
- Be careful not to let any dirt or metal particles get inside the controller.
- Be careful not to drop any nuts or washers inside the controller.

1. Turn the key in the starting switch to the ON position and download the data stored in the payload meter to a personal computer, or carry out the memory card dump operation.

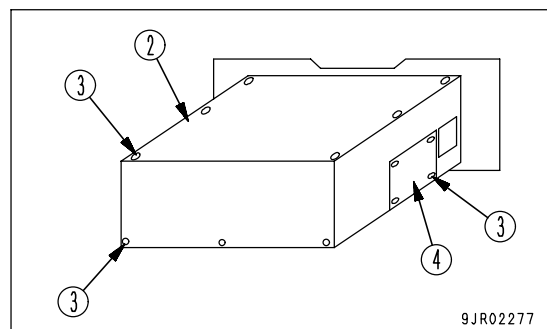
NOTICE

When doing this, do not start the engine.

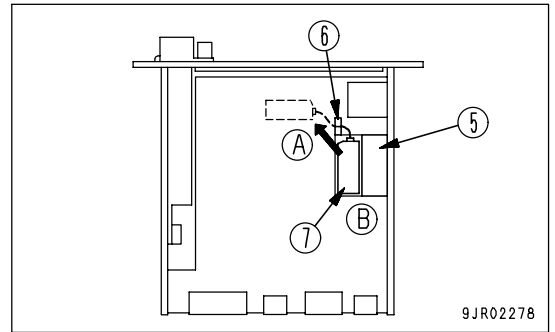
2. Return the starting switch to the OFF position.
3. Remove 4 screws (1) (M6) holding the payload meter, then pull the payload meter to the front.



4. Remove the connector, remove screws (3) (top surface M3 x 9, left face M3 x 4) from top cover (2) of the payload meter, then remove left side cover (4).



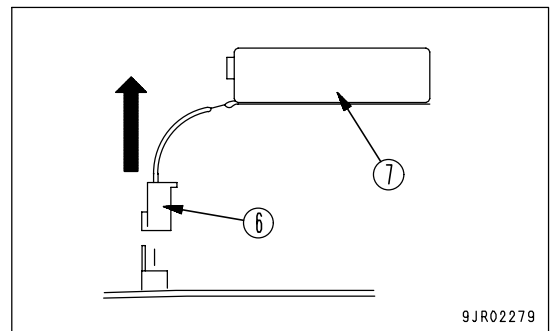
5. Remove the cover of the payload meter. As seen from the top, battery holder (5) is installed at position (B) in the diagram on the right stop using procedure (A) shown in the diagram, remove battery (7) from battery holder (5) without removing connector (6), then put it carefully on top of the motherboard.



NOTICE

Remove connector (6) after removing the battery from battery holder (5). If it is attempted to use force to remove connector (6) when the battery is still in battery holder (5), there is danger that connector (6) may be damaged.

6. Pull battery connector (6) straight out from the motherboard connector, then remove the battery.
7. Insert the connector of the new battery straight into the connector of the motherboard.
8. Put the battery in the battery holder, and pass the wiring through the notch.
When doing this, insert the wiring into the bottom of the holder and pass it in through the notch.



9. Install top cover (2).
10. Assemble the payload meter to its original position in the panel.

PROCEDURE AFTER REPLACING BATTERY

When the battery is replaced, the backup power for the non-volatile memory inside the payload meter is momentarily cut, so mistaken data (garbage) may enter the memory and cause mistakes in the payload meter's recognition of the condition of the machine.

The following operation is necessary to remove this data.

1. Turn the starting switch to the ON position. (F.CAL may flash.)
2. Using the operator check mode, set the machine ID, open ID, speed limit, option code, date and time.
3. Without turning the starting switch to the OFF position, start the engine. (F.CAL may flash.)
4. Carry out calibration.
5. Load to near the rated payload, then dump the load.
6. Move the machine to a safe place, wait for at least 5 sec. after dumping the load in Step 5, then stop the engine.
7. Turn the starting switch to the ON position again.
Do not start the engine when doing this.
8. Carry out the DATA ALL CLEAR in the operator check mode.
9. Forcibly clear the data for the total payload and overall number of cycles.
With this operation, all the mistaken data inside the payload meter are cleared. Apart from the calibration data, all the data recorded in the Steps 1 to 6 (these data are all inaccurate data) are also deleted.
If this operation is carried out in the wrong order, the cycle data (beginning only) will be defective.
10. After the above operation is completed, the payload meter will function normally.

NOTICE

- Replace the battery within 48 hours.
- The service life of the battery is approx. 2 years.

OPERATION WHEN ERROR CODE F.CAL IS DISPLAYED OR CONTROLLER HAS BEEN REPLACED

If F.CAL is displayed, mistaken data have probably been written to the memory inside the payload meter. In addition, when the controller is replaced, old data may be recorded to the new controller, or the machine condition recognized by the controller may be different from the actual condition. To remove these data, carry out the following operation.

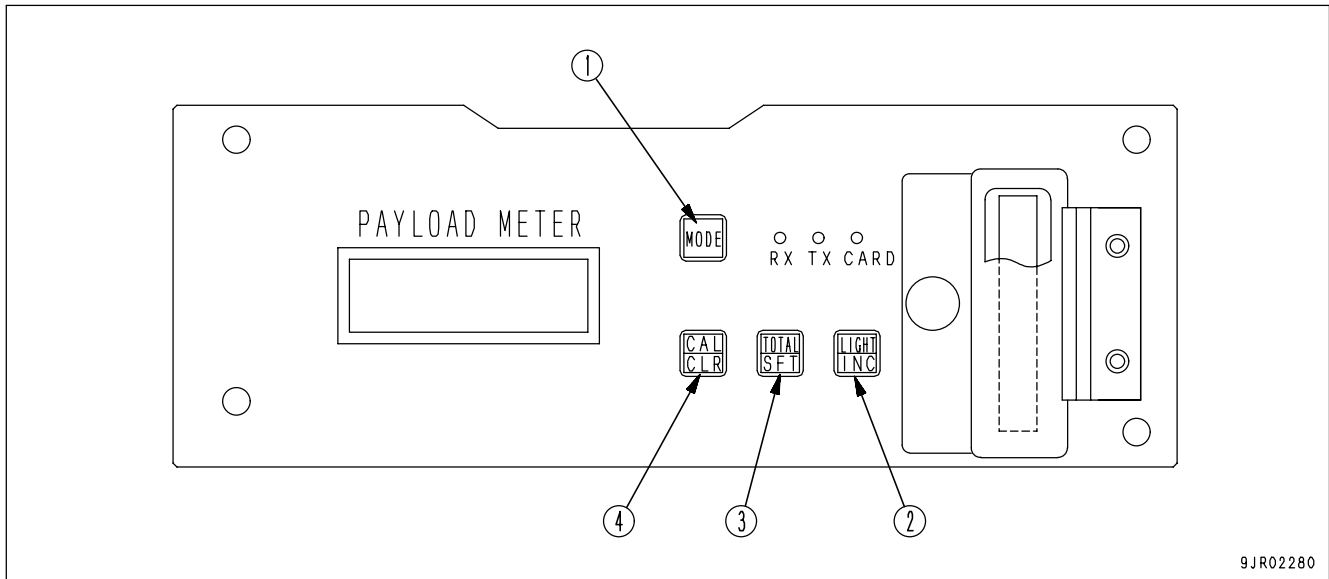
1. Turn the starting switch to the ON position.
2. Forcibly carry out initialization. For details, see "CARRYING OUT FORCED INITIALIZATION (PAGE 6-86)".
3. Turn the starting switch to the ON position. (F.CAL may flash.)
4. Using the operator check mode, set the machine ID, open ID, speed limit, option code, date and time.
5. Without turning the starting switch to the OFF position, start the engine. (F.CAL may flash.)
6. Carry out calibration.
7. Load to near the rated payload, then dump the load.
8. Move the machine to a safe place, wait for at least 5 sec. after dumping the load in Step 7, then stop the engine.
9. Turn the starting switch to the ON position again.
Do not start the engine when doing this.
10. Carry out the DATA ALL CLEAR in the operator check mode.
11. Forcibly clear the data for the total payload and overall number of cycles.
With this operation, all the mistaken data inside the payload meter are cleared. Apart from the calibration data, all the data recorded in the Steps 3 to 8 (these data are all inaccurate data) are also deleted.
If this operation is carried out in the wrong order, the cycle data (beginning only) will be defective.
12. After the above operation is completed, the payload meter will function normally.

CARRYING OUT FORCED INITIALIZATION

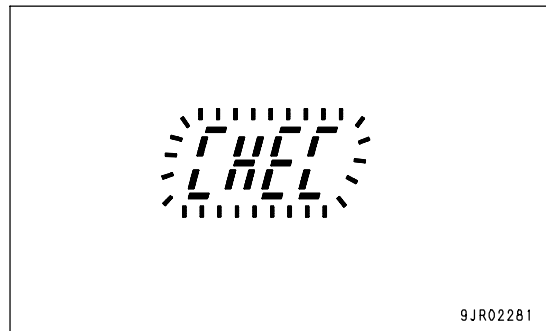

CAUTION

When this function is performed, all of the data recorded in the payload meter are deleted. Do not carry out this operation unless necessary.

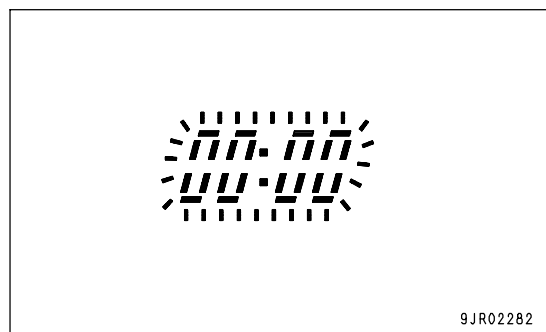
Check the date and time before starting, and always be sure that the machine is empty. This operation is possible only when the power is ON.



1. In the normal display condition, keep MODE switch (1) and LIGHT/INC switch (2) pressed at the same time for at least 2 seconds.
CHEC will flash on the payload meter display.



2. When CHEC is displayed, keep LIGHT/INC switch (2), TOTAL/SFT switch (3), and CAL/CLR switch (4) pressed at the same time for at least 2 seconds.
00:00 will flash on the display.



3. Keep CAL/CLR switch (4) pressed for at least 2 seconds. The 00:00 display will light up for 2 seconds, and when all the data is cleared, the display will automatically change to F.CAL.
After this, carry out the procedure given in "OPERATION WHEN ERROR CODE F.CAL IS DISPLAYED OR CONTROLLER HAS BEEN REPLACED (PAGE 6-85)".

If it is desired to stop the forced initialization when 00:00 is flashing on the display, press MODE switch (1). The display will return to the flashing CHEC display without carrying out the forced initialization.

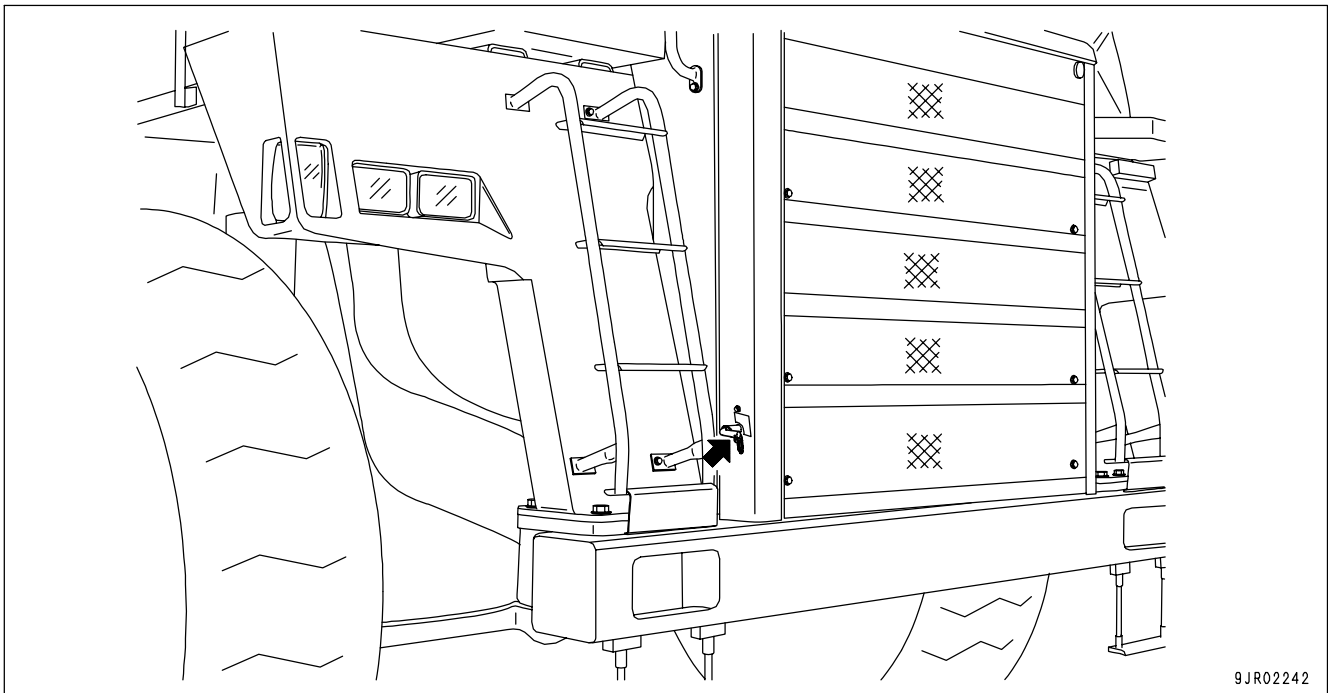
HANDLING BATTERY ISOLATOR

CAUTION

- Do not that the battery isolator switch when the engine is running. This may cause damage to the electrical circuits or controller.
- Never use the battery isolator switch to stop the engine.

The battery isolator prevents consumption of the battery power caused by short circuits or electrical leakage from the equipment during long-term storage.

When repairing any electrical circuit or carrying out welding operations, cut the battery isolator switch (at the position marked by the arrow in the diagram below) to prevent damage to the electrical circuit.



Position (a) (cut): Battery wiring is disconnected and no power flows to electric circuit.

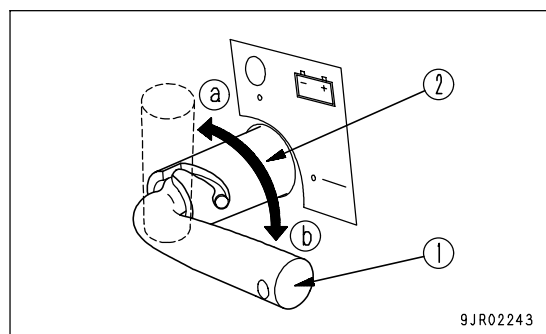
The lever is disconnected from the switch.

Position (b) (connected): Battery wiring is connected and condition returns to normal.

The lever is fixed to the switch.

REMARK

Lever (1) can be removed at position (a). If lever (1) is separated from switch (2), align the protruding part of lever (1) with the groove in switch (2) and install.



NOTICE

When the starting switch is turned OFF, the controller takes a short time to save the data. If the battery isolator switch is shut off while this is happening, the data will be lost. Wait for at least 3 minutes after turning the starting switch OFF before operating the battery isolator switch.

HANDLING AUTO-GREASING SYSTEM

With this system, the grease is automatically supplied through the computer controls.

METHOD OF OPERATING AUTO-GREASING SYSTEM

1. Turn the starting switch ON.

REMARK

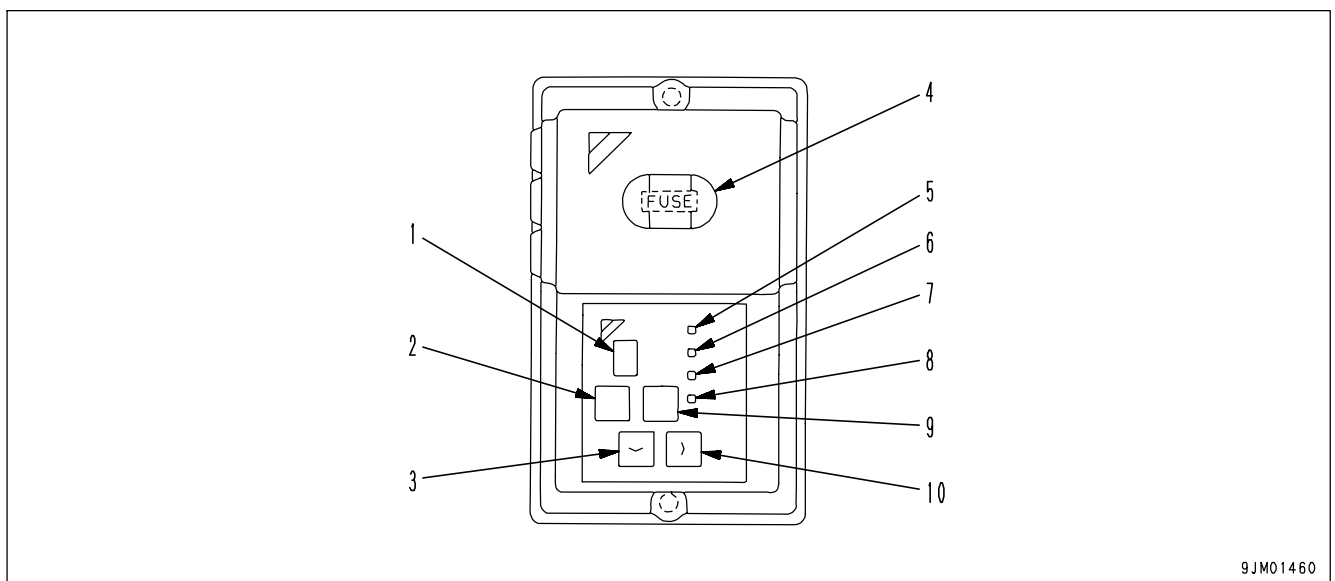
Immediately after the power is turned on, all display lamps on the lubrication controller inside the console box will light up for several seconds. This is a self-check for the lamps, and does not indicate any problem.

The display portion for starting the calculation of the greasing interval will flash, but all other displays will go out after a few seconds.

However, even if the greasing interval has not been reached, if the switch is turned ON/OFF repeatedly, greasing will automatically start due to the function of the supplemental circuit, immediately after the starting switch is turned ON. After display of the 7-segment LED and greasing-in-progress LED, as shown in the "LUBRICATION CONTROLLER DISPLAY TABLE", the above condition will be returned.

2. Centralized greasing is carried out in accordance with the set time and frequency limit for greasing.

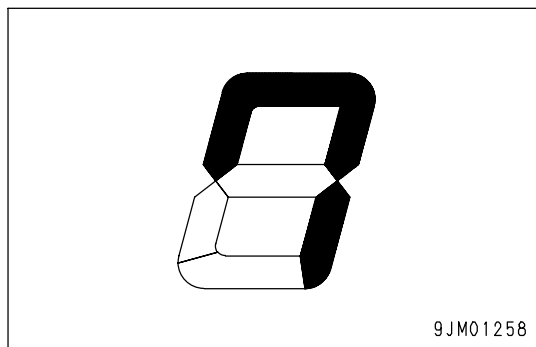
• LUBRICATION CONTROLLER DISPLAY TABLE



- | | |
|------------------------|------------------------|
| (1) 7-segment LED | (6) Greasing LED |
| (2) Cancel key | (7) Warning LED |
| (3) Level selector key | (8) Setting LED |
| (4) Blade-type fuse | (9) Starting key |
| (5) Power source LED | (10) Item selector key |

- Remaining number of times of greasing

If the remaining number of times of greasing is less than 10, remaining number is displayed and it flashes. If the remaining number of times is 10 or more, only the flashing is shown without displaying the number.



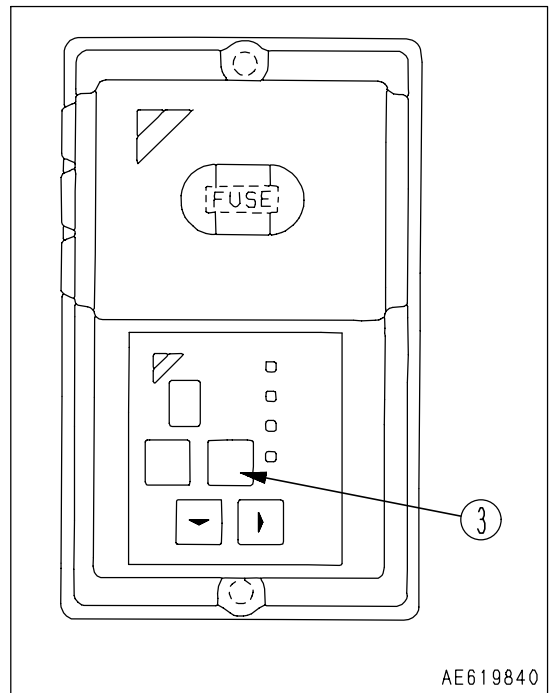
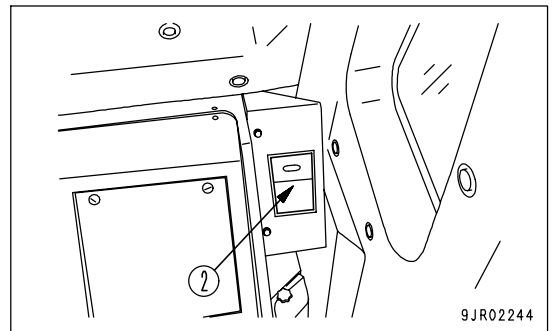
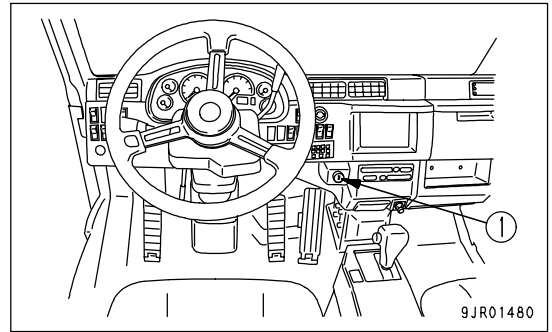
ACTUATION OF AUTO-GREASING

When engine starting switch (1) is turned one stage, the auto-greasing system is automatically set to the actuation condition.

Do not press start button (3) of lubrication controller (2).

- Operating when desired

It is possible to start the system and carry out one cycle of greasing regardless of the time count. To do this, press the button (3) for the lubrication controller inside the console box. The count for the greasing time is canceled, and the electric pump starts the count again automatically after it is stopped.



SETTING GREASING TIME

The set time and greasing frequency limit differs according to the operating condition and greasing plan for the machine, so set the following items to carry out suitable centralized greasing.

- Greasing interval (Hr): Greasing interval for automatic operation
- Greasing time (min): Length of time pump is operated for each greasing operation
- Greasing frequency limit (times):
No. of times for operating pump before the 1600 cc grease cartridge becomes empty

The settings when shipping from the factory are as follows.

Greasing interval: 2 hours

Greasing time: 15 minutes

Greasing frequency limit: 75 times

The grease level alarm is set to sound after 300 hours on the hourmeter (when normal operation).

NOTICE

Be careful since the life of grease cartridge will be shortened if the greasing interval becomes shorter. Also, if the greasing interval becomes shorter, the amount of grease dripping from the tip of the working machine increases. It may make the machine and surrounding area dirty.

Setting greasing time in cold areas

In cold temperatures, the viscosity of the grease increases and the resistance inside the piping becomes greater, so it is necessary to extend the length of the greasing operations in order to ensure that the greasing is carried out properly. If the machine is used in ambient temperatures below -20°C (-4°F), set the greasing time to 20 minutes (code No. 7). In addition, use lithium-based grease No. 0.

For details of setting the time, see "METHOD OF SETTING (PAGE 6-93)".

When changing the set value, please contact your Komatsu distributor.

METHOD OF SETTING

When setting the various items, the value is not input directly. Select the code number from the set code table below, and set as follows.

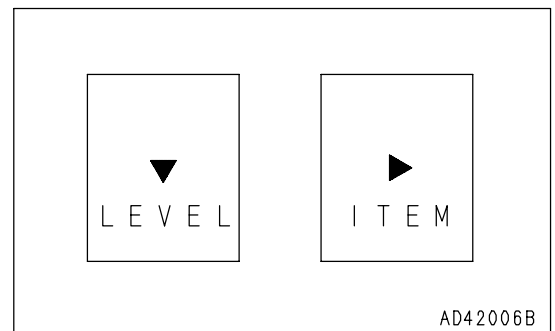
Setting code table

Code no.	0	1	2	3	4	5	6	7	8	9
Greasing interval (a)	/	1	1.5	2	3	4	5	6	8	/
Greasing time (min) (b)	/	2	3	5	7	10	15	20	25	/
Greasing frequency limit (c)	/	25	50	75	100	150	200	250	/	/

NOTICE

When using the machine at ambient temperatures of below -20°C (-4°F), set to greasing time (b) at code No. 7.

- Procedure for setting
 1. Turn the starting switch to START and start the engine.
 2. Press the LEVEL and ITEM keys at the same time to set to the setting mode.



3. Press the ITEM key one or more times to select the item to be set.

REMARK

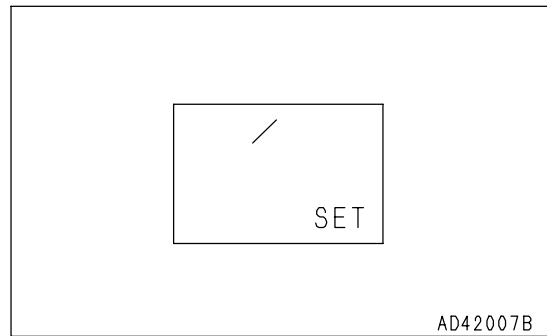
Each time the ITEM key is pressed, the setting item is changed: a → b → c → a.

4. When the item to be set flashes, press the LEVEL key.
The set item and numeral are displayed alternately (a →→ 0 →→ a →→ 0).
5. Refer to the setting code table and press the ITEM key one or more times to select the code number to be set.

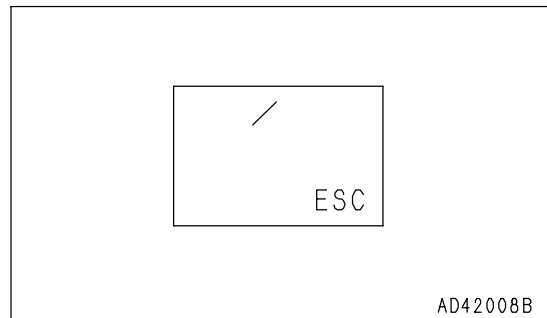
REMARK

Each time the ITEM key is pressed, the code number (numeric portion) goes up by 1.

6. When the code number that is to be set flashes, press the SET key to carry out the setting.



7. Repeat Steps 4 to 6 to set all of the items a, b, and c. After completing the setting, press the ESC key to leave the setting mode.

**REMARK**

Even if it is desired to change only one item, always carry out the setting according to Steps 1 to 6. After completing the setting, always press the ESC key to leave the setting mode.

If the power is then turned ON, the count for the greasing interval will start immediately after the ESC key is pressed. Part of the display segment flashes to indicate that the system is counting. After setting, the set value is retained in memory even if the power is turned OFF.

GREASING

**WARNING**

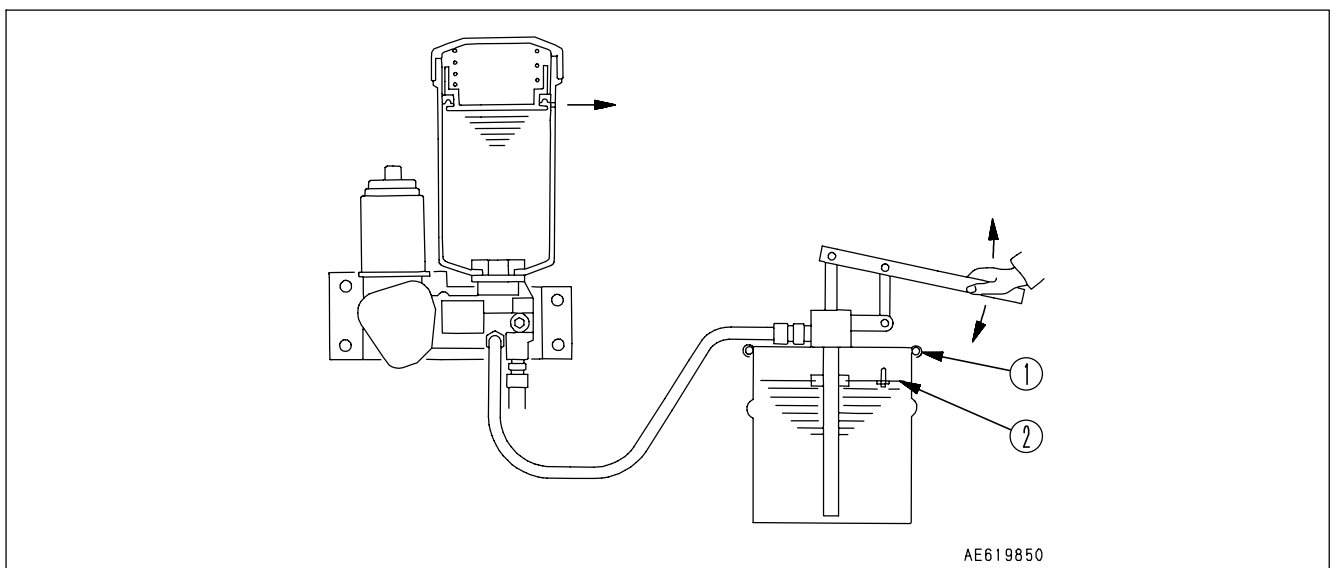
Air bleeding of pump involves danger because of high pressure. Ask your Komatsu distributor for air bleeding.

NOTICE

After greasing, be sure to reset the count of the controller. (See "TROUBLESHOOTING (PAGE 6-96)".)

Be sure to use the special grease pump (566-96-6A840) and supply grease with it according to the following procedures, taking care not to let air or dust get in to the grease. Supply grease while the ambient temperature is above -10°C (14°F) .

1. Prepare a new 18-kg (40 lb) grease pail and remove the cover. Press the follower plate of the grease pump against the greasing surface, then insert the pump and set special cover (1) to the pail. Then, operate the handle of the pump and confirm that clean grease comes out of the hose end.
2. Remove the cap of the grease filler of the pump and screw in the hose fitting, then operate the pump.
3. When grease is supplied for the first time, there is usually some air under the follower plate (2). If grease is supplied to the upper limit, however, the air is bled through the small hole on the side of the tank. When supplying grease next time and there after, stop supplying it when it reaches the bottom of this air bleed hole.
4. After supplying grease, remove the hose fitting and fit the cap to the grease filler of the grease pump without fail. Keep the pump and pail in a clean place.



PRECAUTIONS WHEN HANDLING AUTO-GREASING SYSTEM

- Basically, the power source input to the lubrication controller should be DC24V, but use a maximum limit of 30V.
- The grease nipple installed to the service port used for initial charging of the divider valve has a ball check structure, so it may leak if dirt gets stuck in it.
Check it from time to time, and replace the grease nipple immediately if any grease is leaking.
- When carrying out initial operation or when the grease tank is empty, air may get into the piston portion of the pump. If the pressure does not rise within the specified time when running the pump, and an error is displayed for the controller, bleed the air.
- If the divider valve or grease piping are removed when replacing the attachment on the machine, handle carefully to prevent any damage. When storing or installing again, be extremely careful to prevent the entry of air, and particularly dirt. If there is any air in the system, bleed the air immediately.

TROUBLESHOOTING

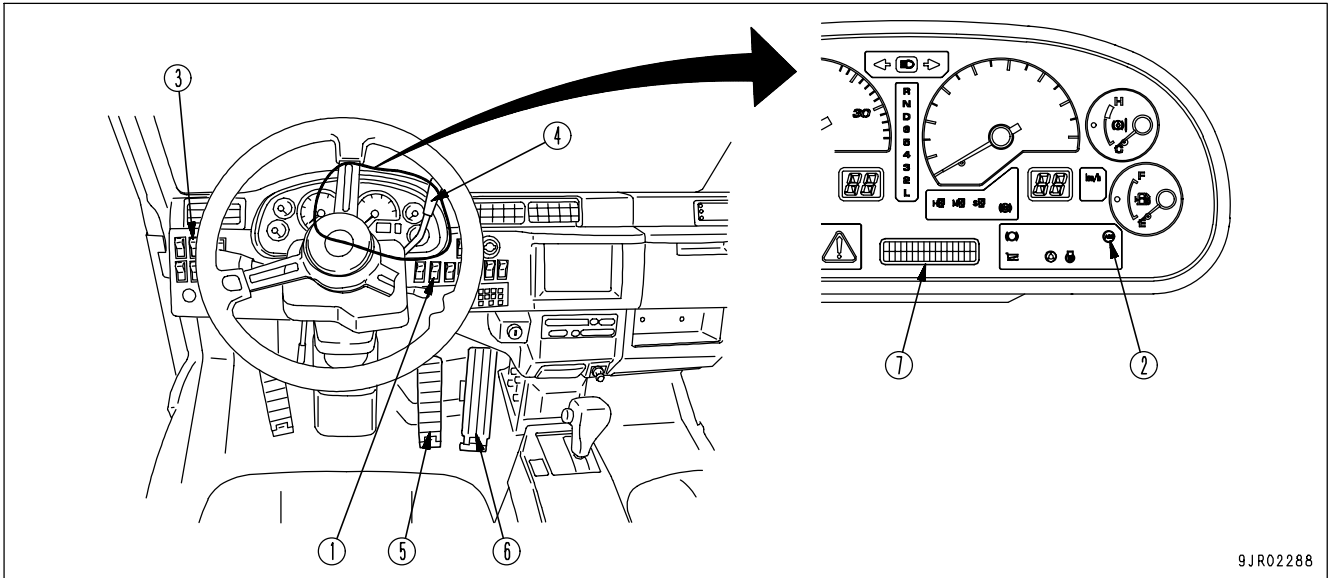
If any problem occurs in the greasing system, the error codes will flash alternately to display the type of problem.

Error code	Item	Cause	Remedy
E → a	Defective pressurizing of pump	<ul style="list-style-type: none"> • Air in main piping • Air inside pump • Grease tank is empty • Grease leaking from main piping 	<ul style="list-style-type: none"> • Run pump as necessary and release grease from end of piping to bleed air • Release grease from air bleed in pump to bleed air • Add grease • Check,tighten connections of main piping (including hoses)
E → b	Problem in release of pressure	<ul style="list-style-type: none"> • Problem in pressure-releasing structure built into pump • Problem in pressure-detection equipment built into pump 	<ul style="list-style-type: none"> • Disassemble pressure-releasing portion carefully, then check and clean • Check limit switch at pressure-detection portion
E → c	Problem in pressure detection	<ul style="list-style-type: none"> • Problem in pressure-releasing structure built into pump • Problem in pressure-detection equipment built into pump 	<ul style="list-style-type: none"> • Check limit switch • Check limit switch at pressure- detection portion
E → 0	Empty tank	<ul style="list-style-type: none"> • Greasing frequency limit has been reached • Grease added during frequency count 	<ul style="list-style-type: none"> • Add grease • Confirm that 0 flashes three times on 7-segment LED by pressing reset button on controller for more than 5 seconds.

HANDLING ABS

The ABS (anti-skid brake system) is a brake system that ensures the steering ability and stable machine posture. It works by automatically suppressing the skidding caused by the wheels locking when the brakes are applied suddenly or are applied on snow-covered roads or other slippery road surfaces.

EXPLANATION OF COMPONENTS

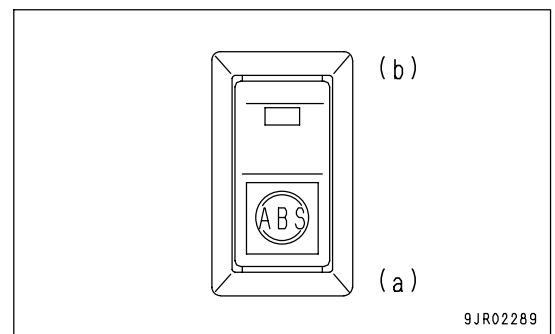


- | | |
|-----------------------------|-----------------------|
| (1) ABS main switch | (5) Brake pedal |
| (2) ABS operation lamp | (6) Accelerator pedal |
| (3) ABS system check switch | (7) Character display |
| (4) Retarder control lever | |

ABS MAIN SWITCH

The switch (1) is used to turn the ABS system ON/OFF.

- (a): ABS system OFF
- (b): ABS system ON

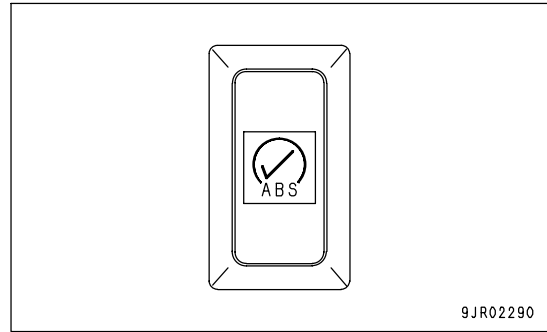


ABS OPERATION LAMP

When the ABS main switch is ON and a tendency for the tires to lock is detected, the ABS is actuated and lamp (2) lights up.

ABS SYSTEM CHECK SWITCH

This switch (3) is used to check the ABS system after the engine is started.

**RETARDER CONTROL LEVER**

When the retarder is being actuated with this lever (4), the ABS is actuated if there is a tendency for the tires to lock.

BRAKE PEDAL

When the wheel brakes are being applied with this pedal (5), the ABS is actuated if there is a tendency for the tires to lock.

ACCELERATOR PEDAL

If this pedal (6) is depressed when the ABS is being actuated, the ABS is canceled.

CHARACTER DISPLAY

If any problem occurs in the ABS system, the action code is displayed on this display (7).

ABS SYSTEM CHECK AFTER STARTING ENGINE

After starting the engine, check the ABS system.

1. Set the machine in the following condition. If the machine is not in the following condition, the ABS system cannot be checked.
 - Parking brake applied
 - Brake oil pressure normal
 - ABS main switch ON
 - No problem in ABS system
2. Keep the brake pedal depressed until the ABS system check is completed.
3. Keep the ABS system check switch pressed for approx. 1 second.
The ABS operation lamp flashes and the ABS check system starts.

REMARK

The ABS system checks the ABS control valve, ABS cut valve, oil pressure switch, and oil pressure sensor. This check is completed in approx. 12 seconds.

4. When the flashing of the ABS operation lamp stops, the check is completed. Release the brake pedal.

OPERATION OF ABS

The ABS can be actuated only when the ABS main switch is ON.

If the retarder control lever is operated or the brake pedal is depressed, the ABS is actuated.

If there is a tendency for the wheels to lock, the ABS system is actuated and the ABS operation lamp lights up.

PRECAUTIONS WHEN USING



WARNING

- When the ABS is actuated on a slippery road surface, the stopping distance will become slightly longer. In addition, when traveling at extremely low speed, the wheels may lock, so be very careful when driving.
 - When traveling on roads with an extremely low friction coefficient (icy roads, etc.) or when traveling up or down a steep hill, it may not be possible to ensure safe travel even with the ABS installed. In such cases, carry out maintenance on the road surface before traveling on it.
 - When the ARSC is being used, even if there is a tendency for the wheels to lock, the ABS is not actuated. The ABS is actuated when the retarder control lever or brake pedal are operated.
 - After turning the ABS main switch ON, it takes a short time for the preparation of the ABS operation, so the ABS is not actuated for 2 seconds. Turn the ABS main switch ON beforehand if it is to be actuated.
-
- It is possible to carry out normal travel even when the ABS main switch is OFF. However, be extremely careful about the machine slipping to the side when traveling on slippery road surfaces.
 - Even if there is a failure in the ABS system, it is possible to carry out normal travel. However, be extremely careful about the machine slipping to the side when traveling on slippery road surfaces. If any problem occurs in the ABS system, the system is automatically turned OFF, so the condition becomes the same as for a machine which does not have the ABS installed.
 - Even when the ABS system is installed, the emergency brake function is maintained, but when the emergency brake is actuated, even if the wheels lock, the ABS is not actuated.
 - When equipping the machine with a wireless system, install it as far as possible from the system equipment and wiring. In addition, when equipping the machine with a wireless system, check carefully that the wireless and operating system do not break any laws regulating use of the airwaves.

TROUBLESHOOTING

This system has a self-diagnosis function. If any problem occurs in the system, the action code is displayed on the character display of the machine monitor.

If an action code is displayed, stop the machine at a safe place and apply the parking brake. Check the failure code in "ACTION CODE (PAGE 3-138)", and ask your Komatsu distributor to carry out repairs.

Failure code		Name of failure	Remedy
DBC0	KK	Drop in power source voltage	Cancel ABS
DBC2	KK	Failure in the solenoid power source system	Cancel ABS
DLF6	KA	Disconnection in wheel rotation sensor (FR)	Cancel ABS
DLF7	KA	Disconnection in wheel rotation sensor (FL)	Cancel ABS
dLF8	KA	Disconnection in wheel rotation sensor (RR)	Cancel ABS
dLF9	KA	Disconnection in wheel rotation sensor (RL)	Cancel ABS
DHU6	KX	Failure in ABS control valve pressure sensor (FR)	Cancel ABS
DHU7	KX	Failure in ABS control valve pressure sensor (FL)	Cancel ABS
DHU8	KX	Failure in ABS control valve pressure sensor (RR)	Cancel ABS
DHU9	KX	Failure in ABS control valve pressure sensor (RL)	Cancel ABS
dk11	KX	Failure in accelerator sensor	Cancel ABS
DWND	KZ	Failure in ABS cut valve (F)	Cancel ABS
DWNE	KZ	Failure in ABS cut valve (R)	Cancel ABS
D1E5	KZ	Failure in ABS relay output system	Cancel ABS
DX21	KA	Disconnection in ABS control valve (FR) output circuit	Cancel ABS
DX21	KY	Short circuit in ABS control valve (FR) output circuit	Cancel ABS
DX21	KB	Short circuit with ground in ABS control valve (FR) output circuit	Cancel ABS
DX22	KA	Disconnection in ABS control valve (FL) output circuit	Cancel ABS
DX22	KY	Short circuit in ABS control valve (FL) output circuit	Cancel ABS
DX22	KB	Short circuit with ground in ABS control valve (FL) output circuit	Cancel ABS
DX23	KA	Disconnection in ABS control valve (RR) output circuit	Cancel ABS
DX23	KY	Short circuit in ABS control valve (RR) output circuit	Cancel ABS
DX23	KB	Short circuit with ground in ABS control valve (RR) output circuit	Cancel ABS
DX24	KA	Disconnection in ABS control valve (RL) output circuit	Cancel ABS
DX24	KY	Short circuit in ABS control valve (RL) output circuit	Cancel ABS
DX24	KB	Short circuit with ground in ABS control valve (RL) output circuit	Cancel ABS
DBC9	KM	Problem in connector connection	Cancel ABS
DBC3	KK	Drop in the battery direct power source voltage	Continue ABS control
DBC1	KK	Drop in main power source voltage	Cancel ABS
DDD9	KA	Disconnection in ABS system switch	Cancel ABS
DDD9	KB	Short circuit in ABS system switch	Cancel ABS
DX21	MA	Defective ABS control valve (FR)	Cancel ABS
DX22	MA	Defective ABS control valve (FL)	Cancel ABS
DWND	MA	Defective ABS cut valve (F)	Cancel ABS
DX23	MA	Defective ABS control valve (RR)	Cancel ABS
DX24	MA	Defective ABS control valve (RL)	Cancel ABS
DWNE	MA	Defective ABS cut valve (R)	Cancel ABS

Failure code		Name of failure	Remedy
DX25	MA	Defective ABS front wheel system control valve	Cancel ABS
DX26	MA	Defective ABS rear wheel system control valve	Cancel ABS

INDEX

<A>		ABS SYSTEM CHECK AFTER	
AIR CONDITIONER	3- 64	STARTING ENGINE	6- 99
<C>		HANDLING AIR SUSPENSION SEAT	6- 9
CAR RADIO	3- 50	SEAT ADJUSTMENT	6- 9
CAR STEREO	3- 56	HANDLING AUTO-GREASING SYSTEM	6- 89
CHECK BEFORE STARTING ENGINE	3- 68	METHOD OF OPERATING	
CHECKS AFTER COMPLETION OF		AUTO-GREASING SYSTEM	6- 89
WORK	3-112	PRECAUTIONS WHEN HANDLING	
CHECKS AFTER STOPPING ENGINE	3- 86	AUTO-GREASING SYSTEM	6- 96
COLD WEATHER OPERATION	3-121	TROUBLESHOOTING	6- 96
AFTER COLD WEATHER	3-123	HANDLING AUTOMATIC SPIN REGULATOR	
PRECAUTIONS AFTER COMPLETION		(ASR)	6- 17
OF WORK	3-122	ACTUATION OF ASR SYSTEM	6- 18
PRECAUTIONS FOR LOW		BLEEDING AIR FROM ASR CIRCUIT	6- 20
TEMPERATURE	3-121	EXPLANATION OF COMPONENTS	6- 17
CONTROL LEVERS AND PEDALS	3- 38	PRECAUTIONS WHEN USING	6- 18
<D>		TROUBLESHOOTING	6- 19
DETERMINING AND MAINTAINING		HANDLING BATTERY ISOLATOR	6- 88
TRAVEL ROAD	3-116	HANDLING OIL, FUEL, COOLANT, AND	
DETERMINING TRAVEL ROAD	3-116	PERFORMING OIL CLINIC	4- 4
MAINTAINING TRAVEL ROAD	3-116	HANDLING PAYLOAD METER (VHMS	
DUMP OPERATIONS	3-109	BUILT-IN TYPE)	6- 21
DUST INDICATOR	3- 44	DATA STORED IN PAYLOAD METER	6- 27
<E>		EXTERNAL DISPLAY LAMPS	6- 24
EXPLANATION OF COMPONENTS	3- 5	MACHINE ID, OPEN ID	6- 31
<F>		NORMAL OPERATION DISPLAY	6- 22
FOREWORD	1- 2	OTHERS	6- 33
FUSES	3- 45	OUTLINE OF SYSTEM	6- 21
<G>		PAYLOAD (CYCLE DATA ITEM)	6- 33
GENERAL PRECAUTIONS	2- 10	PERFORMING CALIBRATION	6- 25
GENERAL VIEW	3- 2	PROCEDURE WHEN	
GENERAL VIEW OF CONTROLS AND		DOWNLOADING	6- 27
GAUGES	3- 3	SERVICE FUNCTIONS	6- 33
GENERAL VIEW OF MACHINE	3- 2	HANDLING PAYLOAD METER II (CARD	
GUIDES TO MAINTENANCE	4- 2	TYPE)	6- 34
<H>		CONTENT OF DISPLAY	
HANDLING ABS	6- 97	(CONTROLLER, EXTERNAL	
EXPLANATION OF COMPONENTS	6- 97	DISPLAY LAMPS)	6- 41
OPERATION OF ABS	6- 99	DETAILS OF DATA STORED IN	
PRECAUTIONS WHEN USING	6-100	MEMORY OF PAYLOAD METER	6- 47
TROUBLESHOOTING	6-101	EXTERNAL DISPLAY LAMPS	6- 45
		GENERAL LOCATIONS	6- 36
		METHOD OF USING ACCURATELY	6- 35
		OPERATION OF SWITCHES	6- 52

OPERATION WHEN ERROR CODE F.CAL IS DISPLAYED OR CONTROLLER HAS BEEN REPLACED -----	6- 85	MECHATRONICS EQUIPMENT CONTROLLER -----	3- 43
PROBLEM AND WARNING DISPLAY (ERROR CODE) -----	6- 75	MOVING MACHINE OFF (FORWARD, REVERSE), STOPPING -----	3- 87
WHEN ERROR CODE F-09 IS DISPLAYED (PROCEDURE FOR REPLACING BATTERY) -----	6- 82	<O> OPERATION -----	3- 68
HANDLING TACHOGRAPH (TCO20-90W) -----	6- 3	OPERATIONS, CHECKS AFTER STARTING ENGINE -----	3- 85
EXPLANATION OF COMPONENTS -----	6- 3	OTHER FUNCTIONS OF MACHINE MONITOR -----	3- 26
METHOD OF USE -----	6- 5	OUTLINE OF ELECTRIC SYSTEM -----	4- 7
HANDLING TIRES -----	3-113	OUTLINE OF SERVICE -----	4- 4
HANDLING VEHICLE HEALTH MONITORING SYSTEM (VHMS) -----	6- 12	<P> PARKING MACHINE -----	3-111
BASIC PRECAUTIONS -----	6- 13	PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS -----	4- 15
CHECK BEFORE STARTING -----	6- 13	PRECAUTIONS DURING OPERATION ----	2- 18
OTHER PRECAUTIONS -----	6- 16	BATTERY -----	2- 24
OUTLINE OF SYSTEM -----	6- 12	OPERATION -----	2- 20
PROCEDURE WHEN DOWNLOADING -----	6- 16	STARTING ENGINE -----	2- 18
<I> INTENDED USE -----	1- 7	TOWING -----	2- 26
DIRECTIONS OF MACHINE -----	1- 7	TRANSPORTATION -----	2- 23
<L> LOADING OPERATIONS -----	3-108	PRECAUTIONS FOR MAINTENANCE ----	2- 27
LOCATION OF PLATES, TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR -----	1- 8	PRECAUTIONS FOR OPERATION -----	3-110
ENGINE SERIAL NO. PLATE -----	1- 8	PRECAUTIONS WITH TIRES -----	2- 33
PRODUCT IDENTIFICATION NUMBER (PIN)/MACHINE SERIAL NO. PLATE -----	1- 8	<R> RECOMMENDED FUEL, COOLANT, AND LUBRICANT -----	4- 9
SERVICE METER POSITION -----	1- 9	RECOMMENDED BRANDS, RECOMMENDED QUALITY FOR PRODUCTS OTHER THAN KOMATSU GENUINE OIL -----	4- 12
TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR -----	1- 9	USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE -----	4- 10
LOCKING -----	3-112	<S> SAFETY CRITICAL PARTS -----	4- 15
LONG-TERM STORAGE -----	3-124	SAFETY INFORMATION -----	1- 5
AFTER STORAGE -----	3-124	SAFETY INFORMATION -----	2- 2
BEFORE STORAGE -----	3-124	SAFETY LABELS -----	2- 4
DURING STORAGE -----	3-124	POSITION FOR ATTACHING SAFETY LABELS -----	2- 5
PRECAUTIONS BEFORE TRAVELING AFTER LONG-TERM STORAGE -----	3-124	SAFETY LABELS -----	2- 6
<M> MACHINE MONITOR -----	3- 5	SAFETY PIN -----	3- 44
MAINTENANCE SCHEDULE CHART -----	4- 16	SELECTING DUMP BODY -----	6- 2
		SERVICE PROCEDURE -----	4- 18

INDEX

CHECK BEFORE STARTING -----	4- 39	<T>	
EVERY 1000 HOURS SERVICE -----	4- 58	TORQUE LIST -----	4- 13
EVERY 15000 HOURS SERVICE -----	4- 71	TRANSPORTATION -----	3-117
EVERY 2000 HOURS SERVICE -----	4- 65	METHOD OF LIFTING MACHINE -----	3-119
EVERY 250 HOURS SERVICE -----	4- 40	METHOD OF SECURING MACHINE ----	3-118
EVERY 4000 HOURS SERVICE -----	4- 70	PRECAUTIONS WHEN	
EVERY 500 HOURS SERVICE -----	4- 51	TRANSPORTING -----	3-117
INITIAL 2000 HOURS SERVICE		STEPS FOR TRANSPORTATION -----	3-117
(ONLY AFTER THE FIRST 2000		TRAVELING DOWNHILL -----	3- 94
HOURS)-----	4- 18	TROUBLESHOOTING -----	3-125
INITIAL 250 HOURS SERVICE (ONLY		AFTER RUNNING OUT OF FUEL -----	3-125
AFTER THE FIRST 250 HOURS) -----	4- 18	IF BATTERY IS DISCHARGED -----	3-129
WHEN REQUIRED -----	4- 19	METHOD OF TOWING MACHINE -----	3-125
SHIFTING GEAR -----	3- 92	OTHER TROUBLE -----	3-133
SPECIFICATIONS -----	5- 2	<W>	
STANDARD TIGHTENING TORQUES		WEAR PARTS -----	4- 8
FOR BOLTS AND NUTS-----	4- 13	WEAR PARTS LIST -----	4- 8
STARTING ENGINE -----	3- 82		
STEERING THE MACHINE -----	3-108		
STOPPING ENGINE -----	3- 86		
SWITCHES -----	3- 29		

HD465-7, HD605-7 GALEO DUMP TRUCK

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