REPLACE RUBBER HOSES PERIODICALLY

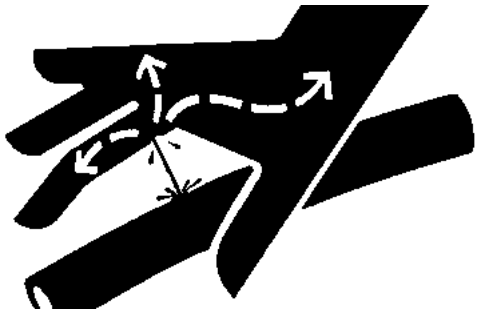
- Rubber hoses that contain flammable fluids under pressure may break due to aging, fatigue, and abrasion. It is very difficult to gauge the extent of deterioration due to aging, fatigue, and abrasion of rubber hoses by inspection alone.
  - Periodically replace the rubber hoses. (See the page of “Periodic replacement of parts” in the operator’s manual.)
- Failure to periodically replace rubber hoses may cause a fire, fluid injection into skin, or the front attachment to fall on a person nearby, which may result in severe burns, gangrene, or otherwise serious injury or death.

SA-019

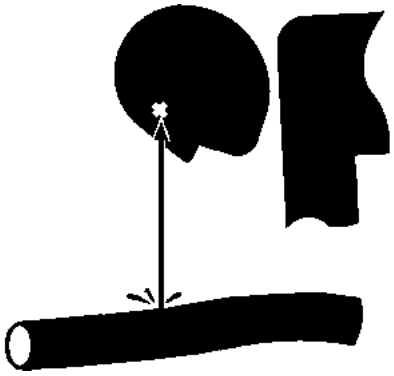
S506-E01A-0019

AVOID HIGH-PRESSURE FLUIDS

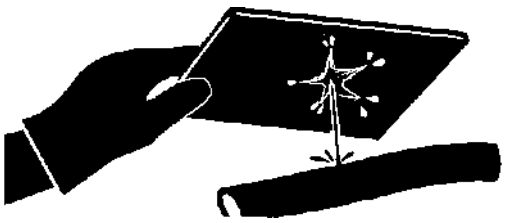
- Fluids such as diesel fuel or hydraulic oil under pressure can penetrate the skin or eyes causing serious injury, blindness or death.
  - Avoid this hazard by relieving pressure before disconnecting hydraulic or other lines.
  - Relieve the pressure by moving the control levers several times. Tighten all connections before applying pressure.
  - Search for leaks with a piece of cardboard; take care to protect hands and body from high-pressure fluids. Wear a face shield or goggles for eye protection.
  - If an accident occurs, see a doctor familiar with this type of injury immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.



SA-031



SA-292



SA-044

507-E01A-0499

Service Recommendations for Split Flange

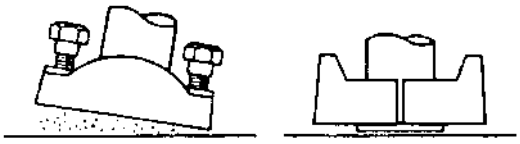
IMPORTANT: 1 Be sure to clean and inspect sealing surfaces. Scratches / roughness cause leaks and seal wear. Unevenness causes seal extrusion. If defects cannot be polished out, replace the component.

2 Be sure to use only specified O-rings. Inspect O-rings for any damage. Take care not to file O-ring surfaces. When installing an O-ring into a groove, use grease to hold it in place.

3 While lightly tightening split flange halves, check that split is centered and perpendicular to the port. Hand-tighten bolts to hold parts in place. Take care not to pinch the o-ring.

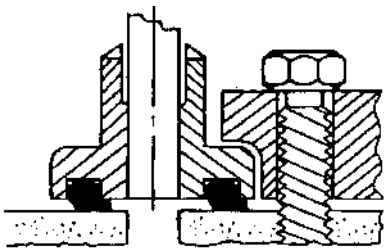
4 Tighten bolts alternately and diagonally, as shown, to ensure even tightening.

5 Do not use air wrenches. Using an air wrench often causes tightening of one bolt fully before tightening of the others, resulting in damage to O-rings or uneven tightening of bolts.

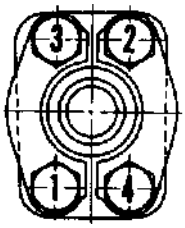


W105-01-01-015

WRONG

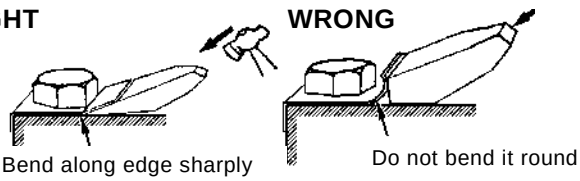


W105-01-01-016

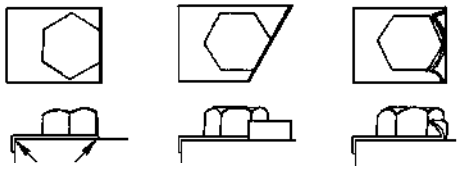


W105-01-01-008

RIGHT **WRONG**



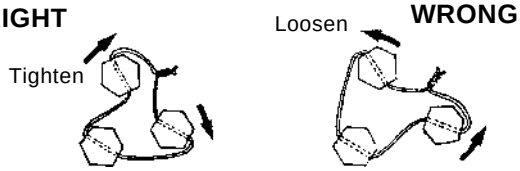
RIGHT **RIGHT** **WRONG**



W105-01-01-009

RIGHT **RIGHT** **WRONG**

RIGHT **WRONG**



W105-01-01-010

Nut and Bolt Lockings

- Lock Plate

IMPORTANT: Do not reuse lock plates. Do not try to bend the same point twice.

- Cotter Pin

IMPORTANT: Do not reuse cotter pins. Match the holes in the bolt and nut while tightening, not while loosening.

- Lock Wire

IMPORTANT: Apply wire to bolts in the bolt-tightening direction, not in the bolt-loosening direction.

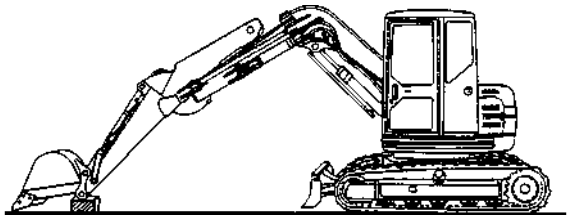
REMOVE AND INSTALL MAIN FRAME (EX75UR-3, EX75URLC-3)

CAUTION:

1. **Hydraulic fluid under pressure can penetrate the skin or eyes, causing serious injury. Avoid this hazard by relieving pressure before disconnecting any hydraulic lines.**
2. **Hydraulic oil becomes hot during operation. Disconnecting hydraulic lines soon after operation can cause severe burns. Wait for the oil and components to cool before starting any repair work.**
3. **The hydraulic oil tank cap may fly off by remaining pressure if removed.**
4. **Prevent personal injury. Metal fragments may fly off when a hammer is used to remove pins. Be sure to wear necessary protection, such as goggles, hardhat, etc.**

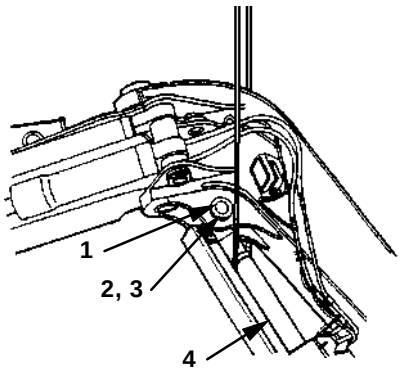
Removal

1. Select a firm level surface to park the machine. Fully retract the bucket and arm cylinders, and lower the boom so that the bucket teeth come in contact with the ground.



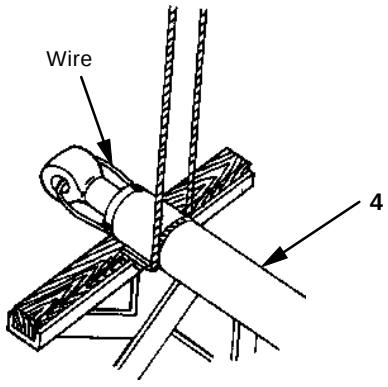
W190-02-03-001

2. Connect boom cylinder (4) to a crane with a sling belt. While slightly raising boom cylinder (4), remove ring (2), stopper pin (3) and pin (1).



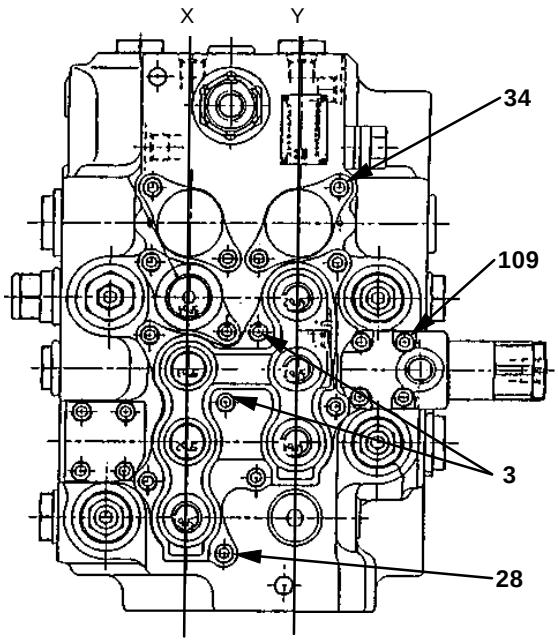
W190-02-03-002

3. Place the rod side of boom cylinder (4) on a supporting block. Start the engine. Operate the boom control lever to retract the rod to prevent the rod from extending, fasten it to the cylinder with a wire, as illustrated. Stop the engine.

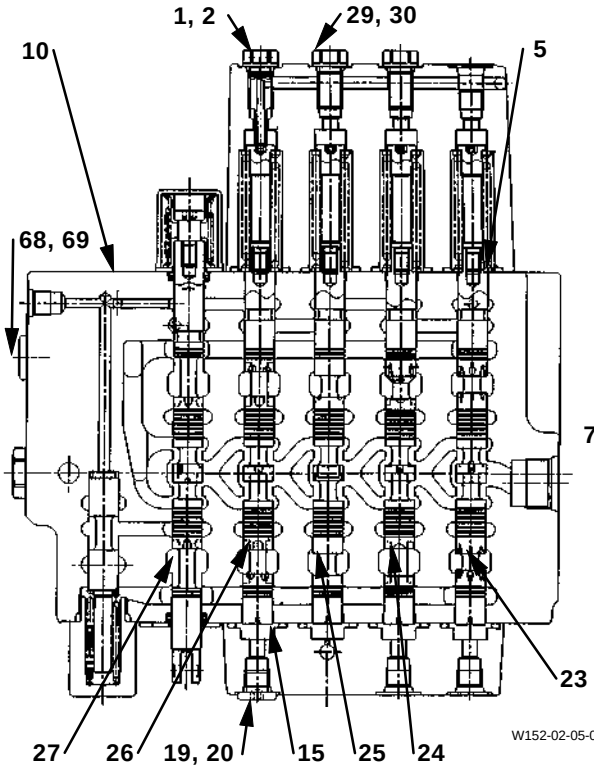


W554-02-03-007

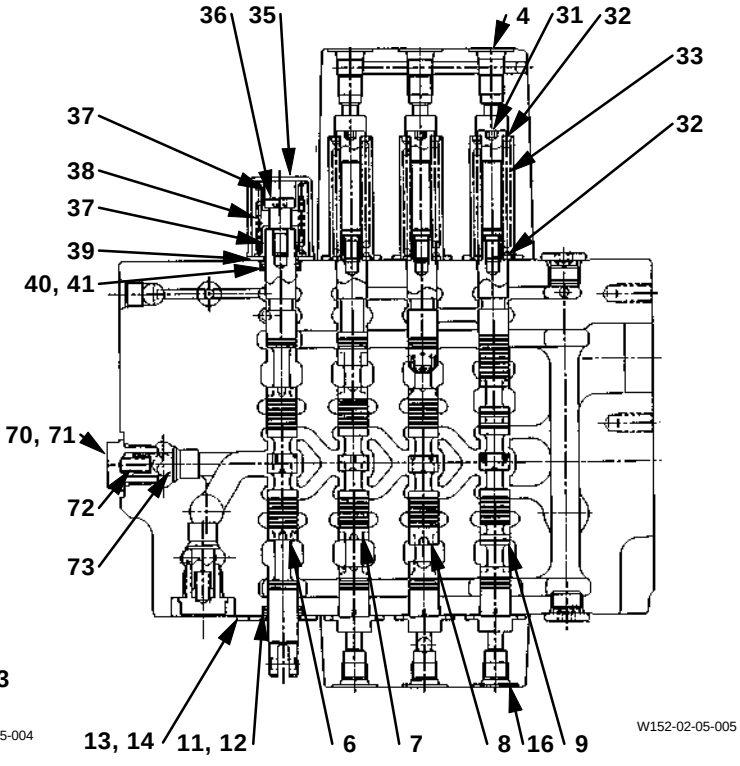
ASSEMBLE CONTROL VALVE (EX60-5)



T152-05-04-002



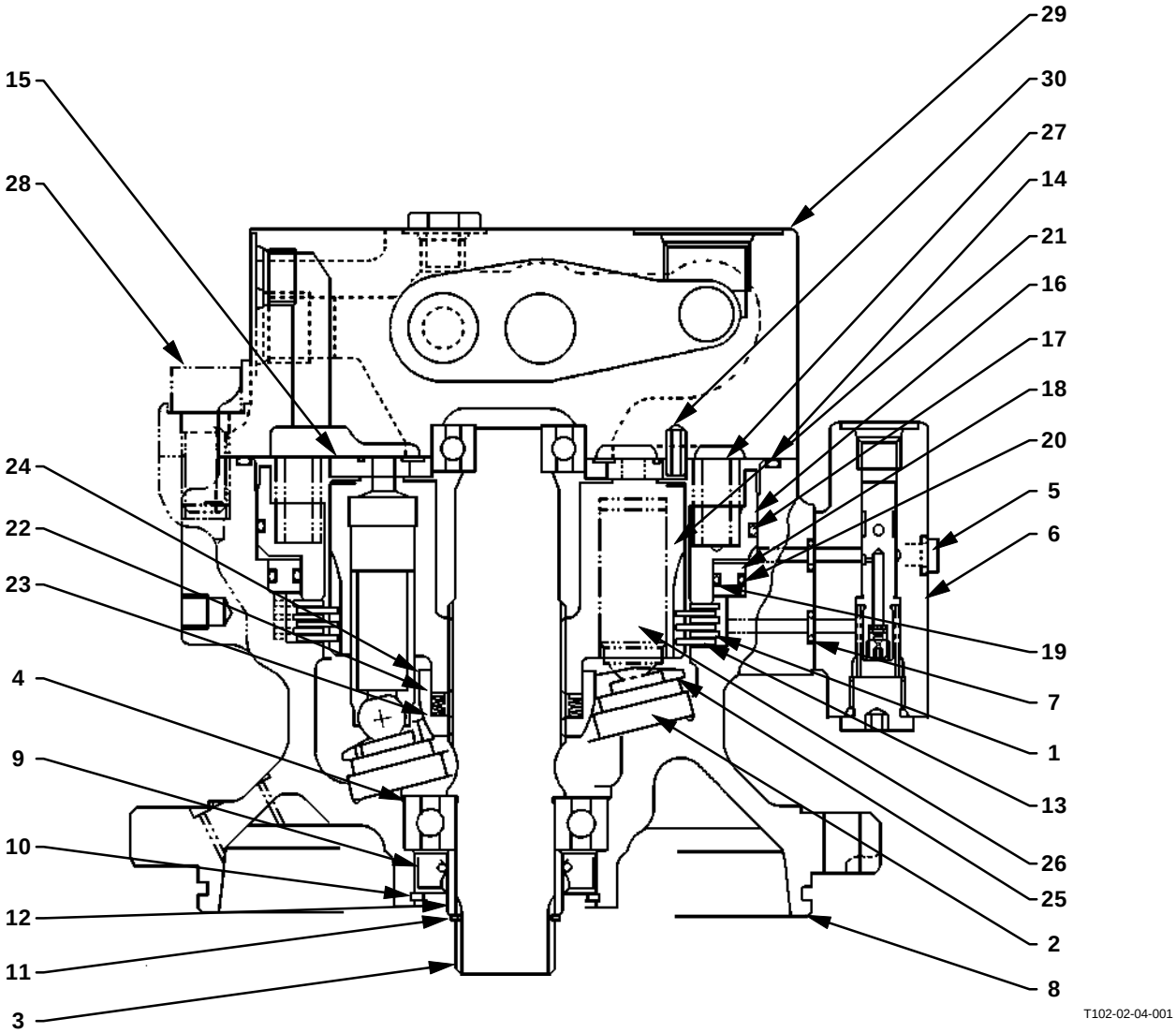
W152-02-05-004



W152-02-05-005

1 - Plug
2 - O-Ring
3 - Socket Bolt (2 Used)
4 - Cover
5 - O-Ring (7 Used)
6 - Spool (Travel Right)
7 - Spool (Bucket)
8 - Spool (Boom-1)
9 - Spool (Arm-2)
10 - Housing
11 - Seal (2 Used)
12 - Wiper (2 Used)
13 - Seal Plate (2 Used)
14 - Socket Bolt (4 Used)
15 - O-Ring (7 Used)
16 - Cover
17 - Socket Bolt (2 Used)
18 - Socket Bolt (7 Used)
19 - Plug
20 - O-Ring
21 - Plug (2 Used)
22 - O-Ring (2 Used)
23 - Spool (Swing)
24 - Spool (Arm-1)
25 - Spool (Boom-2)
26 - Spool (Auxiliary)
27 - Spool (Travel Left)
28 - Socket Bolt (7 Used)
29 - O-Ring (2 Used)
30 - Plug (2 Used)
31 - Spool End (7 Used)
32 - Spring Seat (14 Used)
33 - Spring (7 Used)
34 - Socket Bolt (4 Used)
35 - Cap (2 Used)
36 - Bolt (2 Used)
37 - Spring Seat (4 Used)
38 - Spring (2 Used)
39 - Seal Plate (2 Used)
40 - Wiper (2 Used)
41 - Seal (2 Used)

ASSEMBLE SWING MOTOR (EX75UR-3, EX75URLC-3)



1 - Friction Plate (3 Used)
2 - Thrust Plate
3 - Shaft
4 - Bearing
5 - Socket bolt (2 Used)
6 - Parking Brake Switch Valve
7 - O-Ring (2 Used)
8 - Housing
9 - Oil Seal
10 - Retaining Ring
11 - Retaining Ring
12 - Inner Race
13 - Disc Plate (3 Used)
14 - O-Ring
15 - Valve Plate
16 - Piston
17 - O-Ring
18 - Ring
19 - O-Ring
20 - O-Ring
21 - Rotor
22 - Seat
23 - Disc Spring
24 - Guide
25 - Retainer
26 - Plunger (9 Used)
27 - Spring (18 Used)
28 - Socket Bolt (4 Used)
29 - Brake Valve Assembly
30 - Knock Pin (2 Used)

REMOVE AND INSTALL PILOT RELIEF VALVE UNIT (EX75UR-3, EX75URLC-3)

CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury.
Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines.
Hydraulic oil may be hot after operation. Hot hydraulic oil may spout, possibly causing severe burns. Be sure to wait for oil to cool before starting and repair work.
The hydraulic oil tank cap may fly off by remaining pressure if removed quickly. Slowly loosen the cap to completely release any remaining pressure.

Preparation

1. Park the machine on a firm, level surface. Lower the front attachment to the ground with the arm cylinder fully retracted and the bucket cylinder fully extended.

2. Stop the engine. Move all control levers to release pressure remaining in the system. Push the air release valve on top of the hydraulic oil tank cap to release any remaining pressure

3. Remove hydraulic oil tank cap. Connect a vacuum pump to maintain negative pressure in the hydraulic oil tank.

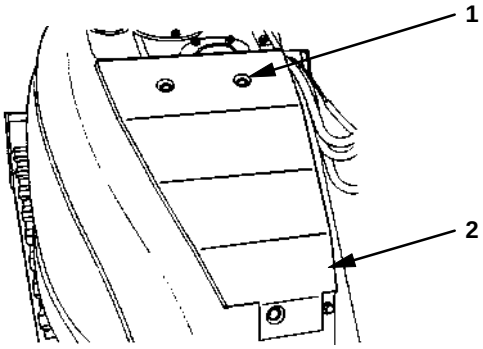
NOTE: Be sure to run the vacuum pump continuously while working.

Removal

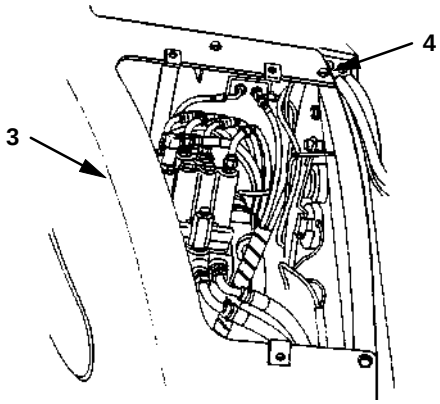
1. Remove battery-cover-mounting bolts (1) (3 used) to remove battery cover (2).
   : 17 mm

2. Remove bolts (4) (2 used), located on right-side cover (3).
   : 17 mm

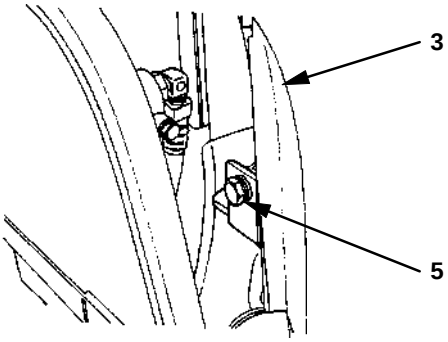
3. Remove bolt (5), located on right-side cover (3).
   : 17 mm



W190-02-02-002



W190-02-02-004

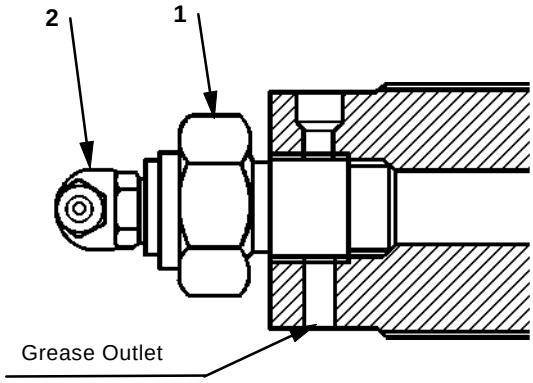


W190-02-02-005

REMOVE AND INSTALL RUBBER TRACK (EX75UR-3)

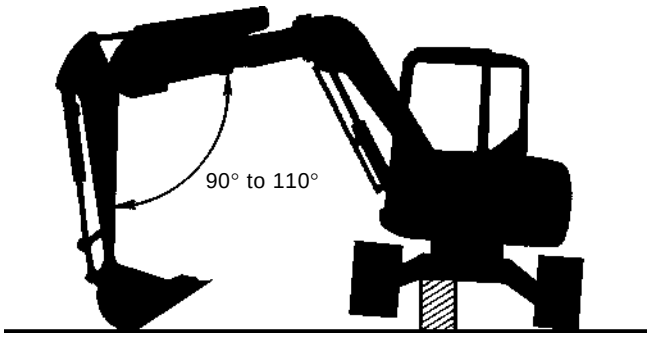
Removal

CAUTION: Grease in the adjuster cylinder is under high pressure. Do not loosen valve (1) quickly or loosen it too much as valve (1) may fly out and high-pressure grease may escape, potentially causing personal injury. Slowly loosen valve (1), keeping body parts and face away from valve (1). Never loosen grease fitting (2).



T190-03-03-003

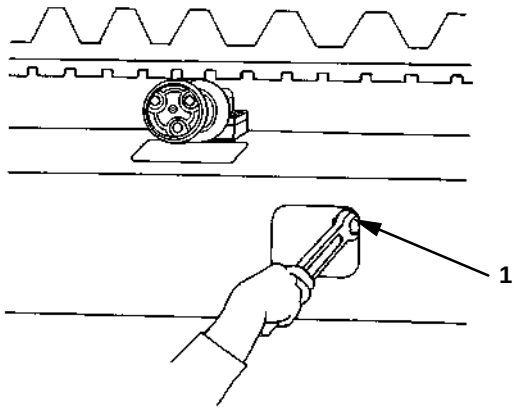
1. Jack up one track using the front attachment, and place blocks under the track frame.



SA-325

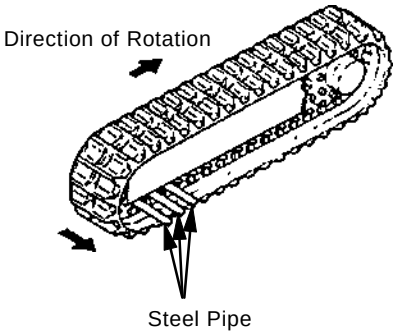
IMPORTANT: If rocks should be caught between the sprocket tooth and the rubber track, remove the rocks before loosening the valve.

2. Slowly loosen track adjuster valve(1) to allow grease to escape.
   : 24 mm



W190-03-06-001

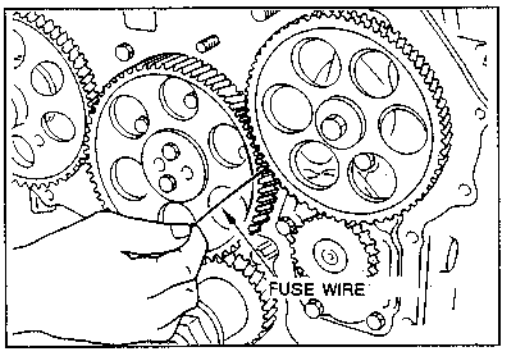
3. Insert pieces of steel pipe into gaps between the rubber track and track frame. Then, rotate the sprocket in reverse direction.
   After the rubber track is raised off the sprocket teeth with the steel pipes, slide the rubber track away from the track frame and remove it.



M503-07-062

- Put a fuse wire at each inspection point shown above, and rotate the gears in the direction indicated by the arrows. Using a micrometer, measure the thickness of the thinnest portion of the crushed wire.

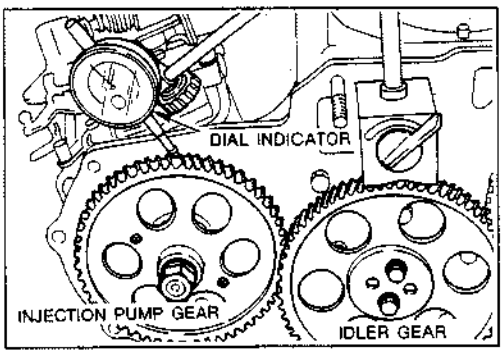
  Service standard
  0.07 - 0.11 mm (0.0028 - 0.0043 in)
  Service limit
  0.2 mm (0.008 in)



Inspection using dial indicator

Inspection method

1) Set the dial indicator stem squarely on the tooth face of the gear being checked.
2) Move the mating gear slightly until the indicator needle stops moving, then zero the indicator.



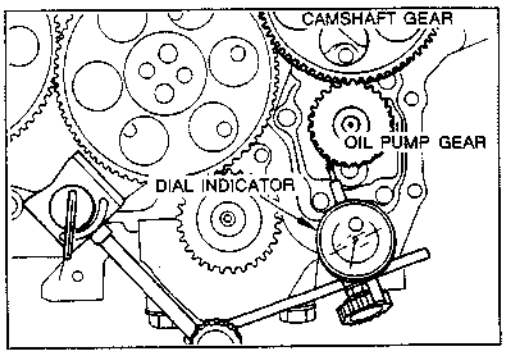
3) Move the gear being checked, slightly in the normal directions indicated, then take the reading where the needle stops.

- Injection pump gear to idler gear backlash

  Standard
  0.07 - 0.11 mm (0.0028 - 0.0043 in)
  Service limit
  0.2 mm (0.008 in)

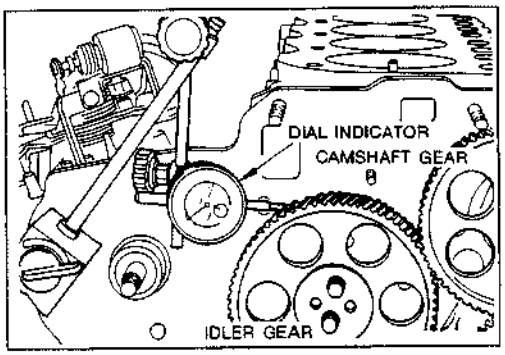
- Camshaft gear to oil pump gear backlash

  Standard
  0.07 - 0.11 mm (0.0028 - 0.0043 in)
  Service limit
  0.2 mm (0.008 in)



- Idler gear to camshaft gear backlash

  Standard
  0.07 - 0.11 mm (0.0028 - 0.0043 in)
  Service limit
  0.2 mm (0.008 in)



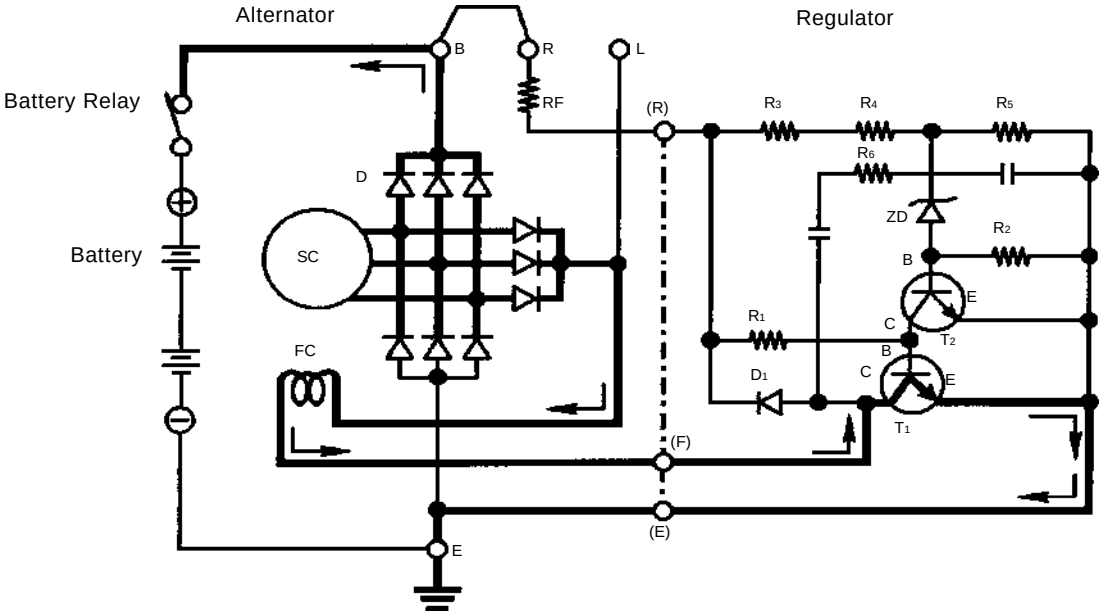
Power Generation

The alternator consists of field coil FC, stator coil SC and diode D.
The regulator consists of transistors T_1 and T_2, Zener diode ZD and resistance R_1 and R_2.
Alternator terminal B connects as follows:

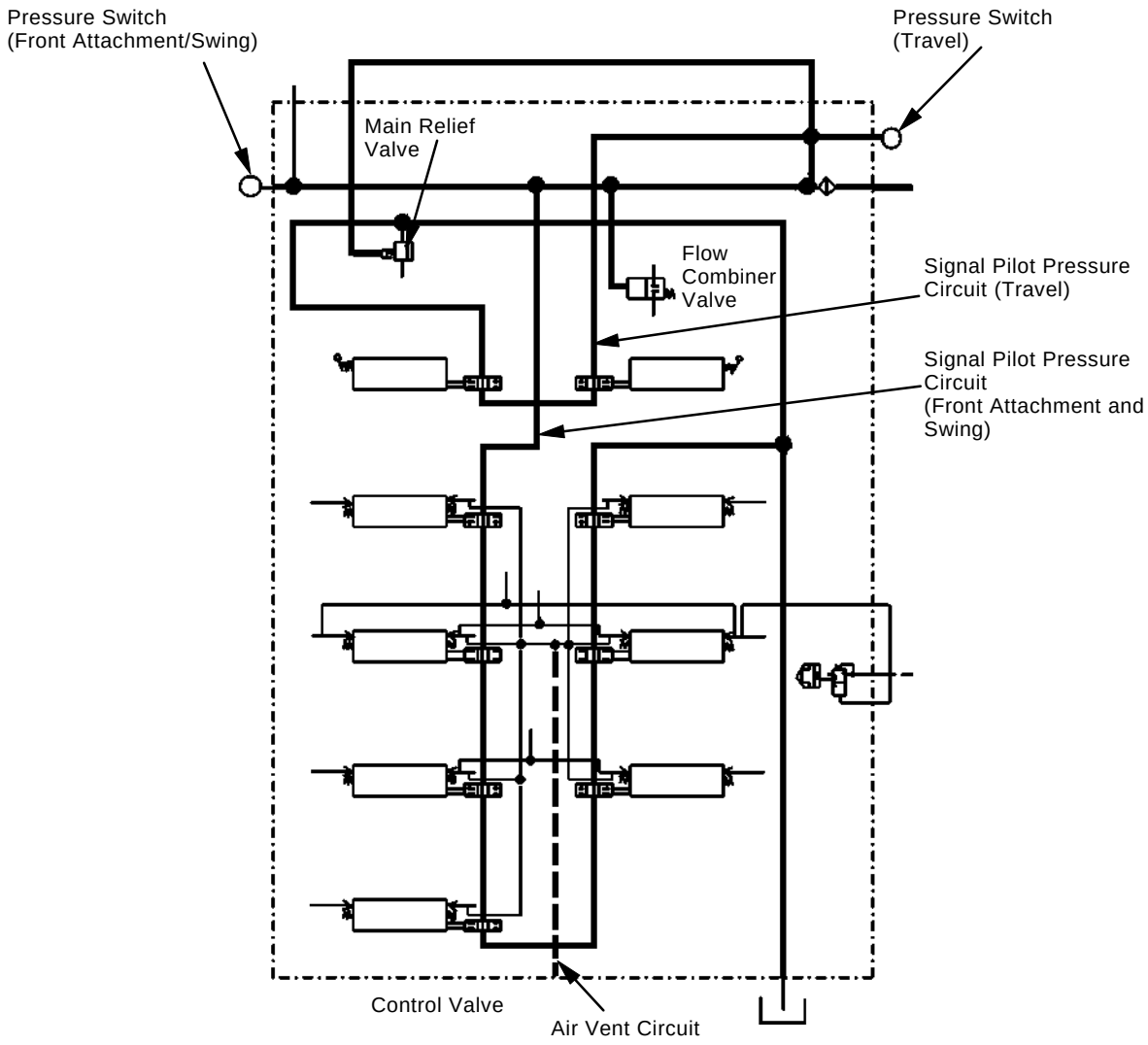
$$B \rightarrow R \rightarrow RF \begin{cases} \rightarrow (R) \rightarrow R_1 \rightarrow \text{Base B of Transistor} T_1 \\ \rightarrow FC \rightarrow (F) \rightarrow \text{Collector C of Transistor} T_1 \end{cases}$$

While the battery relay is turned ON, the battery voltage acts on base B of transistor T_1, connecting collector C and emitter E. In other words, the grounding side of field coil FC is grounded through transistor T_1.
At first, no current flows through field coil FC. As the rotor starts rotating, alternating voltage is generated in stator coil SC by rotor's remanent excitation field.

Consequently electrical current flows through field coil FC, further magnetizing the rotor. This in turn causes an increase of generating voltage, resulting in an increase of electrical current flowing through field coil FC. Repeating the above described cycle, generating voltage further increases to charge the batteries.



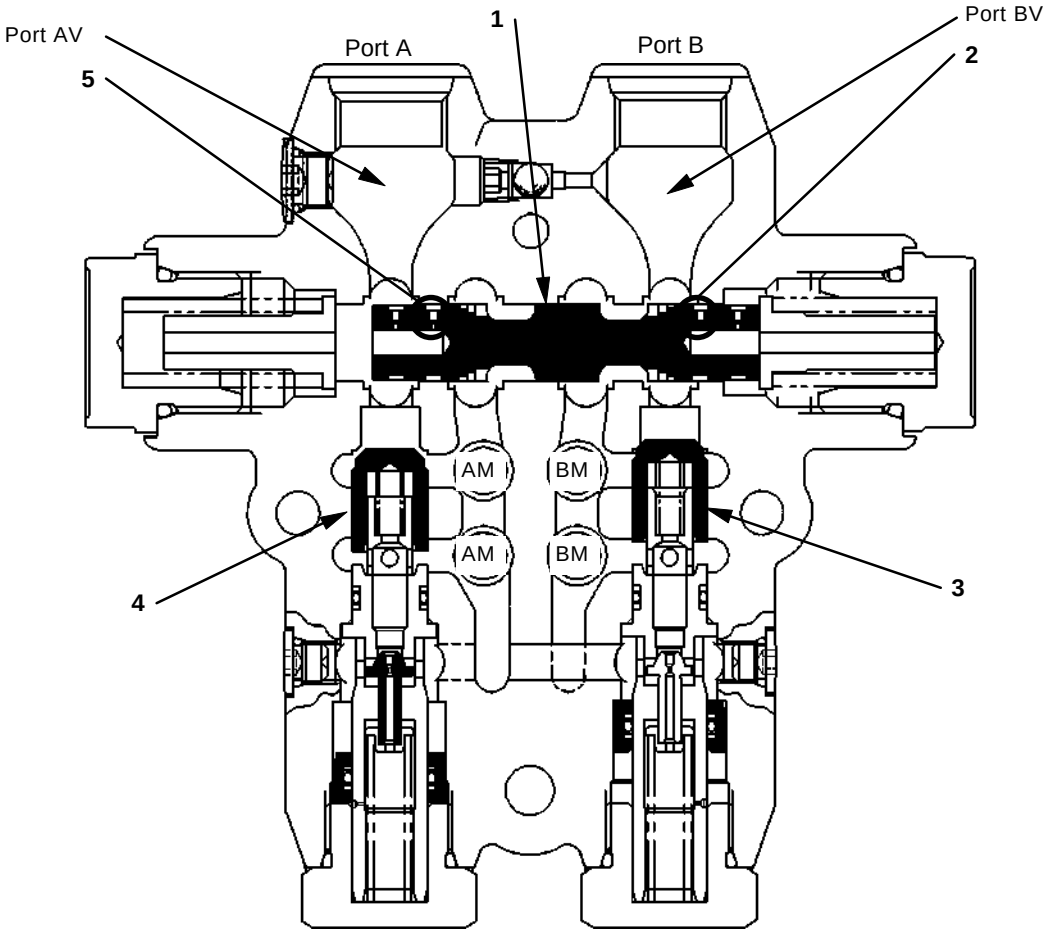
T157-04-02-008



T152-03-03-017

1 - Boom Raise
2 - Boom Lower
3 - Arm Roll-Out
4 - Arm Roll-In
4 - Left Swing
5 - Right Swing
5 - Bucket Roll-In
6 - Bucket Roll-Out

- EX75UR-3



T190-03-02-009

SWING BEARING PLAY

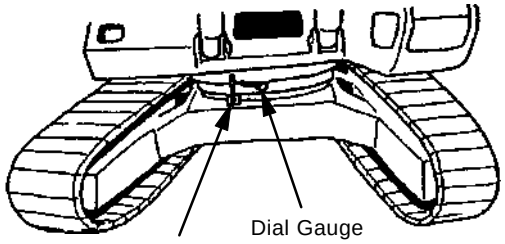
Summary:
To check the wear on the swing bearing races and balls by measuring the swing bearing play between the outer race and the inner race.

Preparation:
1. Check swing bearing mounting bolts for looseness.
2. Check the lubrication of the swing bearing. Confirm that bearing rotation is smooth and without noise.
3. Install a dial gauge with a magnetic base on the track frame as shown.
4. Position the upperstructure so that the boom aligns with the tracks facing towards the front idlers.
5. Position the dial gauge so that its needle point comes into contact with the bottom face of the bearing outer race.
6. Bucket should be empty.

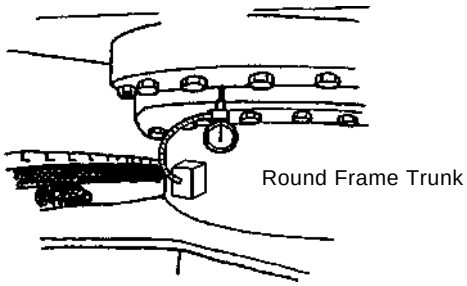
NOTE: The measured value may differ depending on where the dial gauge magnetic base is located. Mount the magnetic base directly onto the round frame trunk or as close to the round frame trunk as possible.

Measurement:
1. With the arm rolled out and bucket rolled in, hold the bucket bottom flush with the boom fool pin. Record the dial gauge reading (h_1).
2. Lower the bucket to the ground and raise the front side of the machine approx. 0.5 m (20 in) above the ground. Record the dial gauge reading (h_2).
3. Calculate bearing play (H) from this data (h_1 and h_2) as follows:
   $(H) = (h_2) — (h_1)$

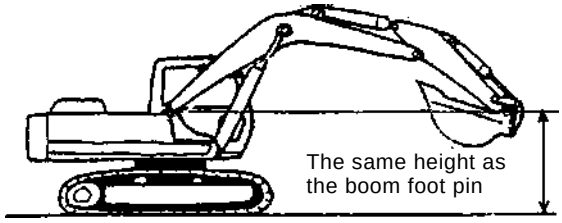
Evaluation:
Refer to Performance Standard Table in Group T4-2.



T105-06-03-014

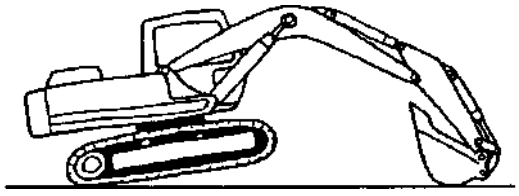


Measurement of (h_1)
T105-06-03-015



T105-06-03-013

Measurement of (h_2)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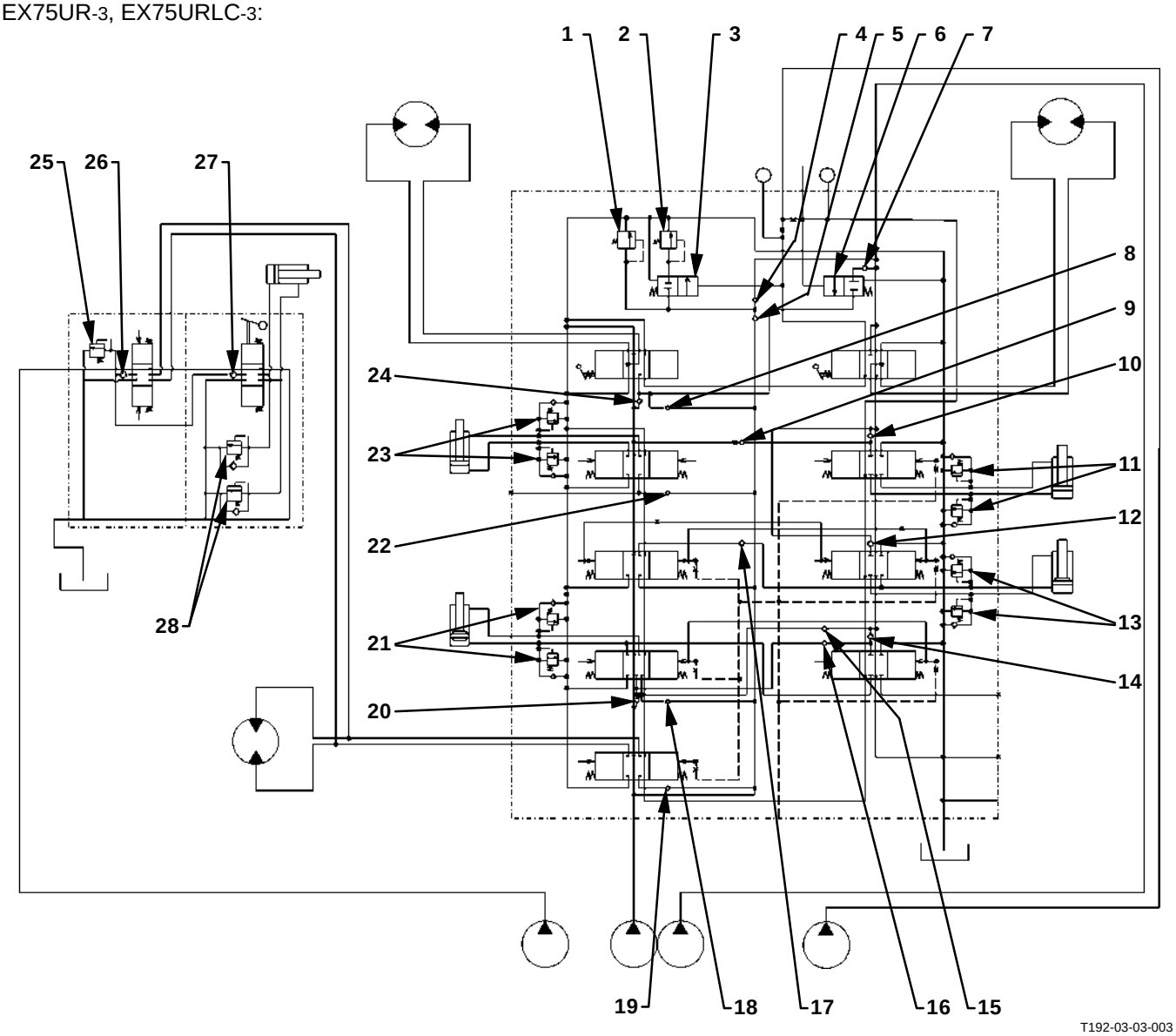
EX75UR-3, EX75URLC-3:



T192-03-03-003

1 - Main Relief Valve (Front Attachment/Swing)
2 - Main Relief Valve (Travel)
3 - Relief Set Pressure Change Valve
4 - Check Valve
5 - Check Valve
6 - Flow Combiner Valve
7 - Check Valve
8 - Load Check Valve (Travel Parallel Circuit)
9 - Check Valve (Flow Combining Circuit)
10 - Load Check Valve (Bucket Circuit)
11 - Overload Relief Valve (Bucket)
12 - Load Check Valve (Boom 1 Parallel Circuit)
13 - Overload Relief Valve (Boom)
14 - Load Check Valve (Arm 2 Tandem Circuit)
15 - Check Valve
16 - Check Valve
17 - Check Valve
18 - Load Check Valve (Arm 1 Parallel Circuit)
19 - Load Check Valve (Swing Parallel Circuit)
20 - Load Check Valve (Arm 1 Tandem Circuit)
21 - Overload Relief Valve (Arm)
22 - Load Check Valve (EX75UR-3: Offset Parallel Circuit) (EX75URLC-3: Auxiliary Tandem Circuit)
23 - Overload Relief Valve (EX75UR-3: Offset) (EX75URLC-3: Auxiliary)
24 - Load Check Valve (Travel Tandem Circuit)
25 - Main Relief Valve (Precise Swing)
26 - Load Check Valve (Swing Circuit)
27 - Load Check Valve (EX75UR-3: Blade Parallel Circuit) (EX75URLC-3: Auxiliary Parallel Circuit)
28 - Overload Relief Valve (EX75UR-3: Blade) (EX75URLC-3: Auxiliary)

Faulty coolant temperature sensor.

YES — Faulty monitor (coolant temperature gauge).

NO — Broken harness between monitor (coolant temperature gauge)and sensor.

Faulty coolant temperature sensor.

YES — Short circuit of harness between monitor (coolant temperature gauge) and sensor.

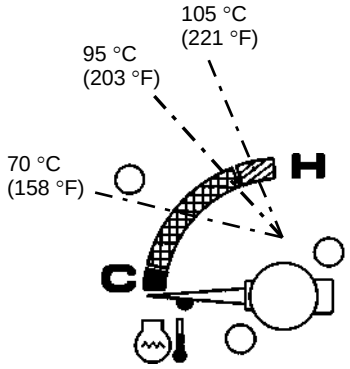
NO — Faulty monitor (coolant temperature gauge).

Faulty coolant temperature sensor.

Faulty monitor (coolant temperature gauge).

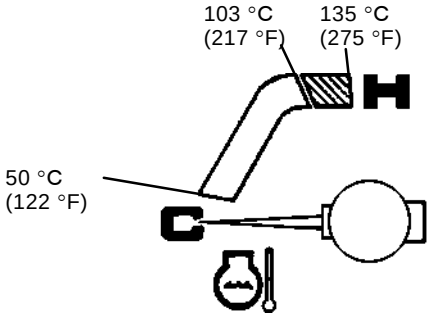
Coolant Temperature Gauge

EX60-5



T157-07-05-001

EX75UR-3, EX75URLC-3



M554-01-013

Coolant Temperature Sensor

Coolant Temperature	Resistance
50±0.2 °C (122±0.4 °F)	112.4±10 Ω
60±0.2 °C (140±0.4 °F)	79.3±5 Ω
80±0.2 °C (176±0.4 °F)	41.8±2.5 Ω
100±0.3 °C (212±0.5 °F)	23.6±0.9 Ω
105±0.3 °C (221±0.5 °F)	20.7±0.6 Ω
120±0.3 °C (248±0.5 °F)	14.2±0.3 Ω

Connector (Harness End Connector Viewed from the Open End Side)

EX60-5

Monitor (12P)

6	5	4	3	2	1
12	11	10	9	8	7

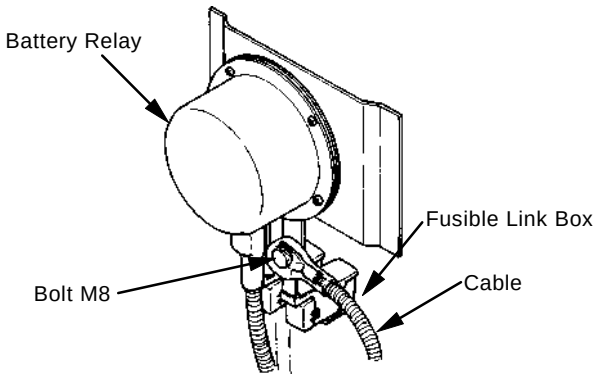
EX75UR-3, 75URLC-3

5	4		○	3	2	1
12	11	10	9	8	7	6

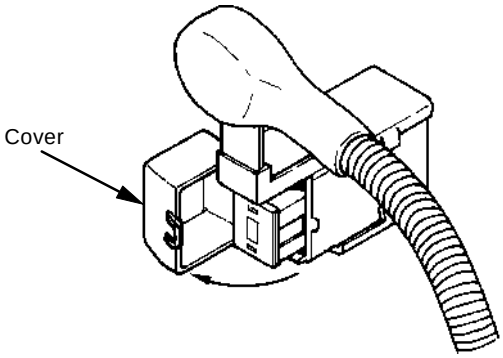
FUSIBLE LINK INSPECTION

Inspection

1. Remove the negative cable from the battery.
2. Loosen bolt M8 connecting the cable in front of the fusible link box. Turn the cable to the horizontal position as illustrated.
3. Open the front cover of the fusible link box and visually inspect the fusible link inside.



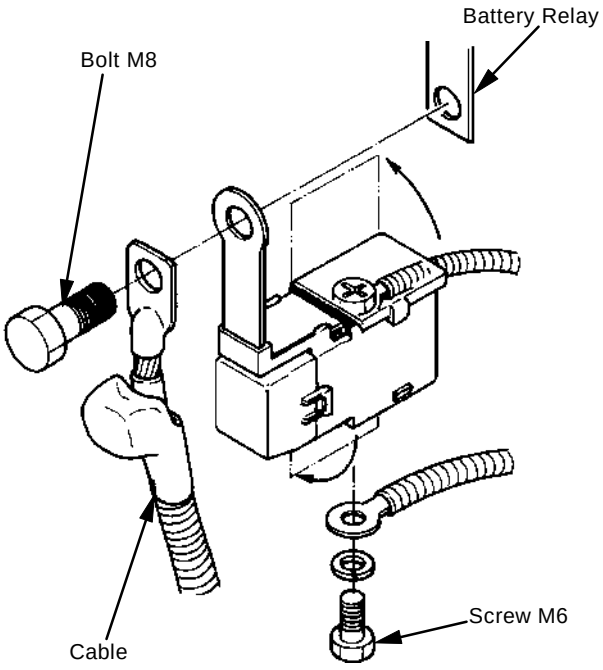
T107-04-02-006



T107-04-05-007

Replacement

1. Make sure that the negative cable is removed from the battery.
2. Remove bolt M8 and take the fusible link box off the battery relay.
3. Open the top and bottom covers of the fusible link box and remove screws M6 (2 used).
4. Take out the fusible link and replace it.
5. Retighten screws M6 (2 used).
6. Connect the fusible link box cable to the battery relay.
7. Connect the negative cable to the battery.



T107-04-05-008