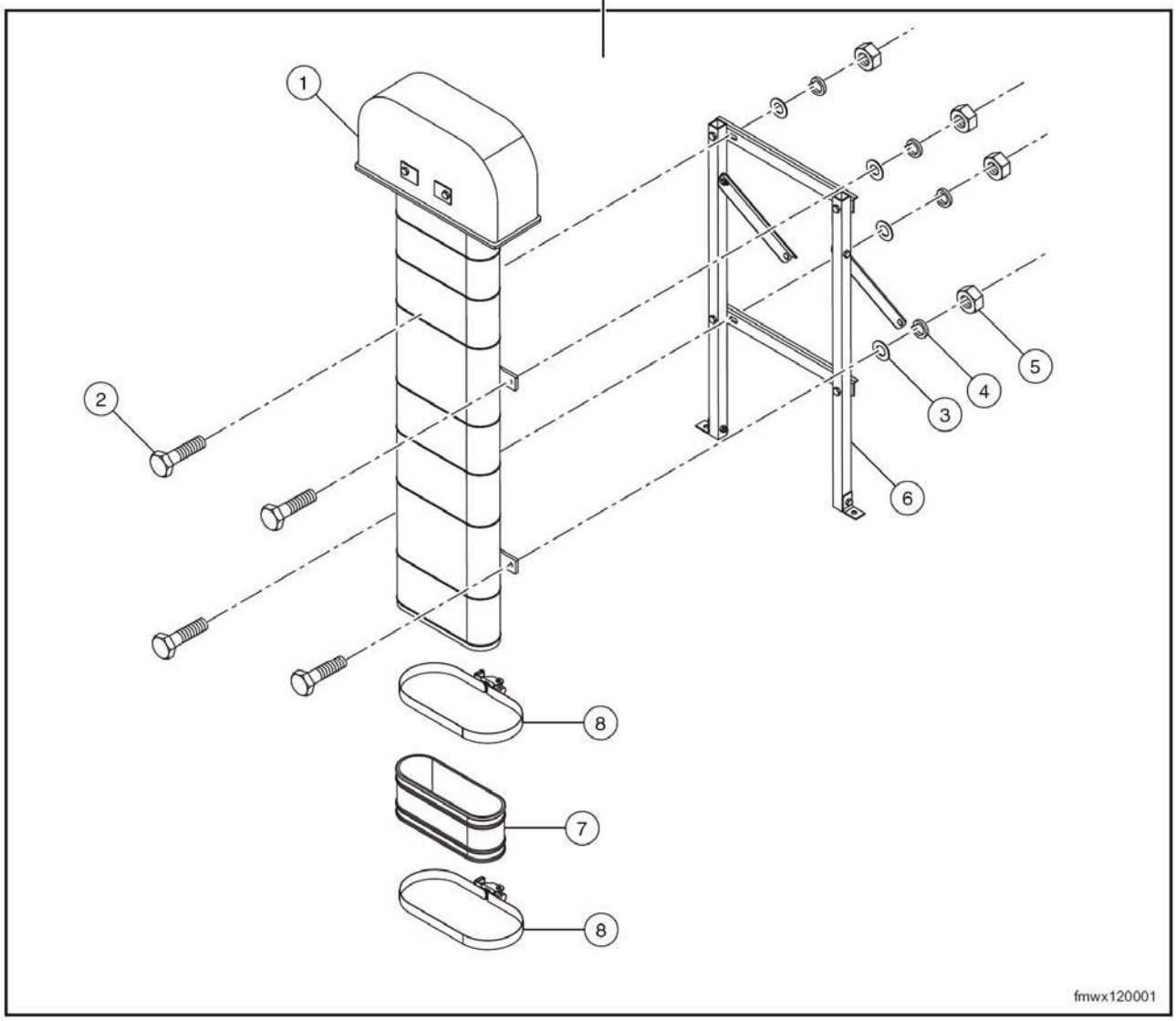
Total Content

Introduction 01
Presentations 02
Maintenance Specification 03
Diagnosis 04
Fuel (WP10) 11A
Fuel (WP12) 11B
Fuel (WD615) 11C
Air Intake 12
Exhaust & Turbocharger (WP10) 13A
Exhaust & Turbocharger (WP12) 13B
Exhaust & Turbocharger (WD615) 13C
Cooling (WP10) 14A
Cooling (WP12) 14B
Cooling (WD615) 14C
Lubrication (WP10) 15A
Lubrication (WP12) 15B
Lubrication (WD615) 15C
Engine Mechanical (WP10) 16A
Engine Mechanical (WP12) 16B
Engine Mechanical (WD615) 16C
Engine Control 17
Starting & Preheating System (WP10) ... 18A
Starting & Preheating System (WP12) ... 18B
Starting & Preheating System (WD615) 18C
Charging System (WP10) 19A
Charging System (WP12) 19B
Charging System (WD615) 19C
Front Suspension 21
Rear Suspension 22
Tire & Wheel 23
Front Axle (Ankai) 24A
Front Axle (Triring) 24B
Rear Axle 25
Service Brake 26
Parking Brake 27
Frame 28
Intermediate Axle (Steyr) 29A
Intermediate Axle (Benz) 29B
Transmission（RT-11509C） 31A
Transmission（9JS135） 31B
Transmission（12JSD160） 31C
Clutch 32
Drive Shaft 33
Power Take-off 34
Steering Wheel & Steering Column 41
Power Steering Mechanism 42
Heater & Air Conditioner 51
Seat Belt 52
Battery 53
Lighting 54
Wiper & Washer 55
Audio System 56
Horn 57
Circuit Diagram 61
Glass, Window Lifter and Rear-view Mirror 72
Dashboard, Instrument, Cigarette Lighter 73
Seats 74
Door, Lock, Door Handle 75
Interior & Exterior Trim Parts 76
Cab 77
Hydraulic Dump System 91

Example:

Assembly Relationship of Parts



1	High-mounted Intake Pipe Assembly
2	Hex Head Bolt
3	Flat Washer
4	Spring Washer

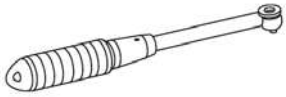
5	Hex Nut, Style 1
6	High-mounted Intake Pipe Bracket Assembly
7	High-mounted Intake Pipe Bracket Assembly
8	Worm Drive Type Hose Hoop, Type A

List of Part Names

Glass, Window Lifter, Rear-view Mirror

Preparations

Recommended Tool

	Glass Sucker	Glass
	Inside Hex. Wrench	Inside Hex. Bolt
	Torque Wrench	Bolt

Accessory

Sealant	CEMEDINE POS Sealant

Reference List of Data Stream

Name of Data Stream	High Speed	Idle Speed	Static
Engine speed (r / min)	2396	598	0
Coolant temperature (°C)	76.13	71.63	76.53
Battery voltage (V)	28.17	28.33	27.00
Accelerator Pedal Position Sensor 1 (V)	3.80	0.74	0.74
ccelerator Pedal Position Sensor 2 (V)	A1.92	0.38	0.38
Calculated Accelerator Pedal Position (%)	100	0	0
Pre-spray 1 fuel injection time (μs)	0	529	0
Main injection duration (μs)	686	516	0
Injection quantity (mg)	26.0	5.6	58.7
Rated fuel rail pressure (MPa)	86.3	41.8	40.0
Actual fuel rail pressure (MPa)	86.8	42.2	0.0
Accumulator Pressure Sensor voltage (V)	2.43	1.42	0.49
Fuel Adjustment Unit Trigger (mA)	1324	1443	401
Fuel dosage unit pulse rate factor (%)	17.68	19.08	7.13
Coolant Temperature Sensor voltage (V)	1.06	1.18	1.05
Atmospheric Pressure Sensor voltage (V)	4.04	4.03	4.03
Atmospheric pressure (hPa)	1022	1021	1021
Actual boost pressure (hPa)	1306	1024	1016
Voltage, air intake temperature (V)	2.85	2.89	2.56
Air intake temperature (°C)	28.9	28.0	35.4
Engine oil temperature (°C)	82.3	77.9	78.0
Fuel temperature (°C)	76.1	76.1	76.3
Operating speed	0	0	0
Engine Control Fault Indicator is off	Closed	Closed	Closed
Brake Switch 1 is on	Closed	-	-
Brake Switch 2 off	-	Open	Open
Clutch Switch is not operated	Closed	Closed	Closed
Engine Fault Indicator	ON	ON	ON
Brake Master Switch logic value	OFF	OFF	OFF

1-3-6 Common Rail Pipe Pressure Limiting Valve

Description

Before the fault inspection, verify the faults put forward by the customers by confirming the vehicle condition as failed or normal.

Ask the customers whether the appropriate engine oil and fuel has been used and whether additional non-manufacturer equipment has been installed.

Refer to this chapter, “General Steps for Fault Diagnosis”.

Once abnormal fluctuation of fuel pressure is monitored by common rail pressure sensor, ECU will record the fault.

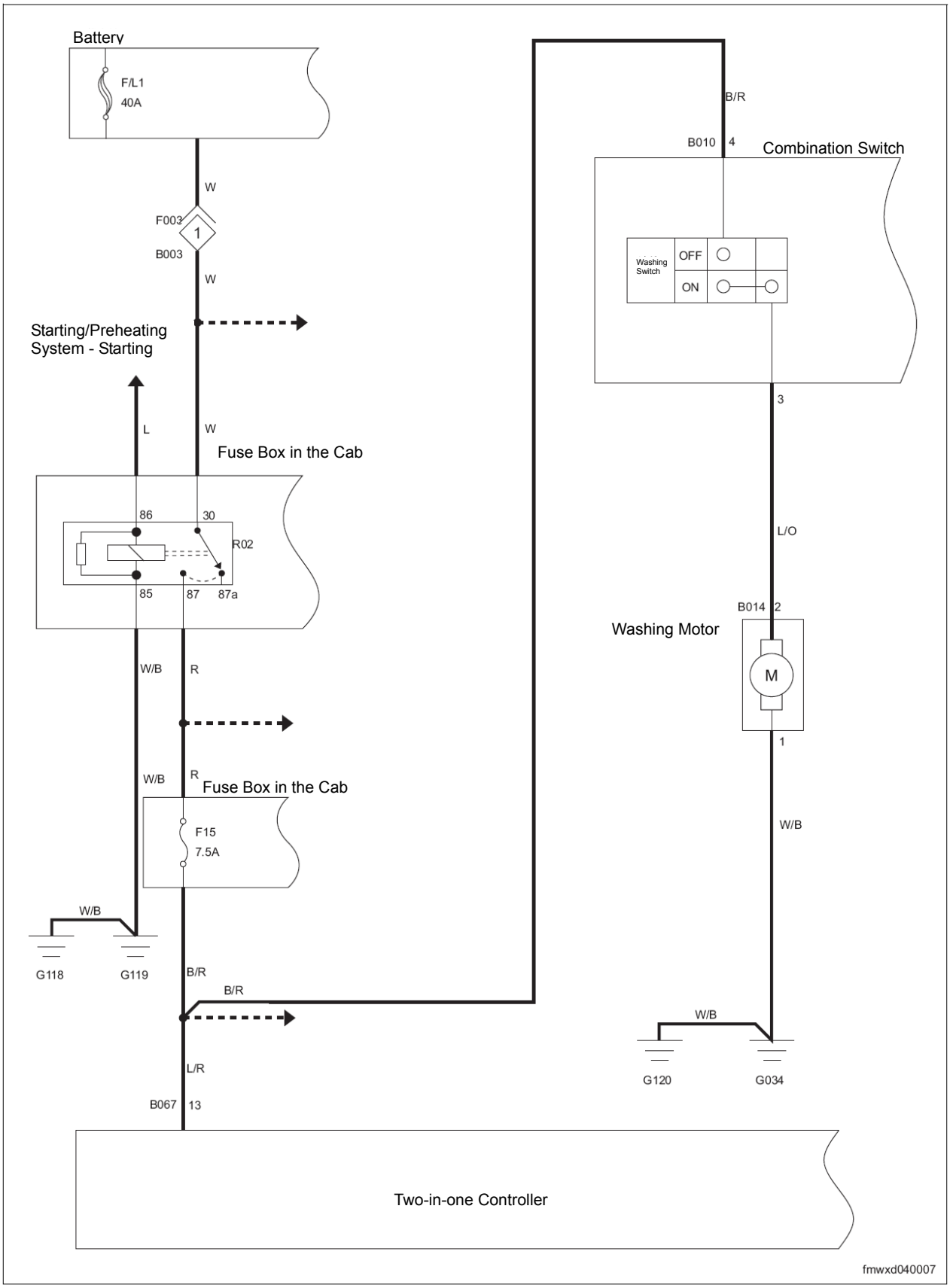
Parts that may cause faults

1. **Fuel oil deficiency (The deficiency of fuel oil in the oil tank may cause the air suction while jolting)**
2. **The fuel pipe is bent, blocked or leaking (the suction pipe of the fuel tank has foreign matters or the fuel pipe is bent and extruded or has foreign matters).**
3. **Air exists in fuel pipeline (the air shall be exhausted).**
4. **Common rail pipe and its pressure control device (pressure limiting valve) (damaged, pressure release).**

04

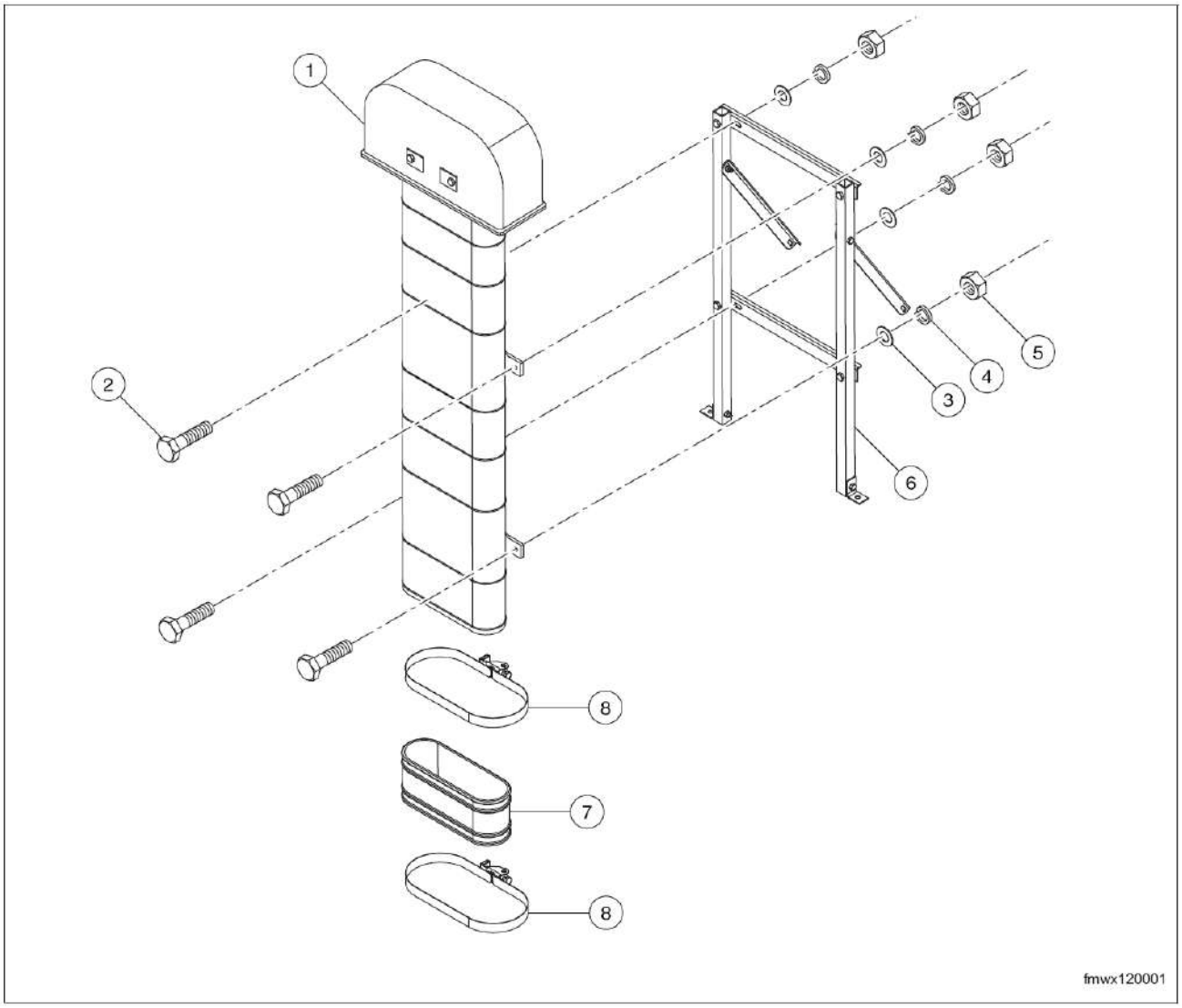
Washer Fails to Work and the Wiper is Normal.

Circuit Diagram



High-position Intake Pipe

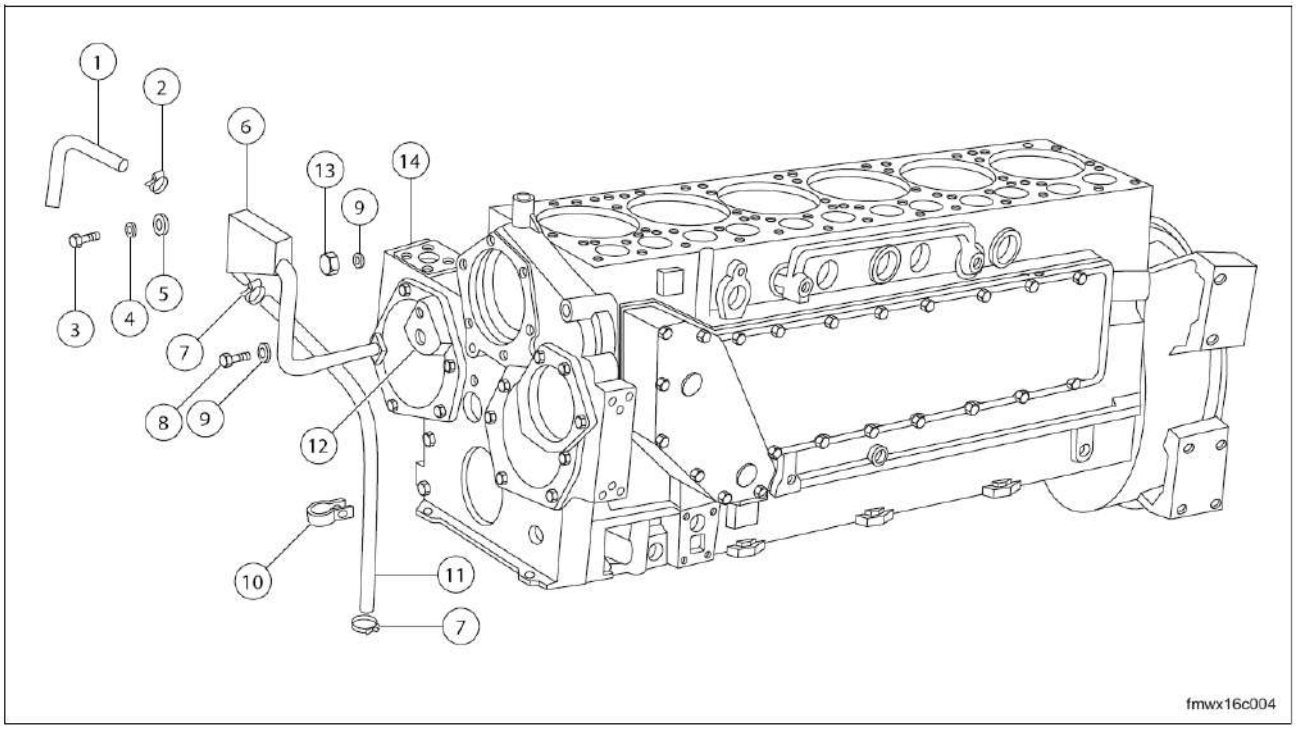
Part Drawing



1	High-position Intake Pipe Assembly		5	Hex Head Nut - Style 1
2	Hex Head Bolt		6	High-position Intake Pipe Bracket Assy.
3	Flat Washer		7	Connecting Hose
4	Spring Washer		8	Worm Drive Type Hose Hoop - Style A

1	Oil Filler Pipe Cap Assembly
2	Oil Filler Pipe Assembly
3	Prevailing Torque Type All-metal Hex Nut, Style 2
4	Hose Clamp
5	Rubber Hose with Fibre
6	Short Oil Filler Pipe Assembly
7	Hex Head Bolt
8	Spring Washer
9	Gasket, Short Oil Filler Pipe

10	Support Block
11	Single Pipe Clamp
12	Oil Dipstick
13	Hex Head Bolt
14	Oil Dipstick
15	Upper Assembly, Oil Dipstick Pipe
16	Lower Assembly, Oil Dipstick Pipe
17	Single Pipe Clamp
18	Oil Dipstick Rubber Hose



16C

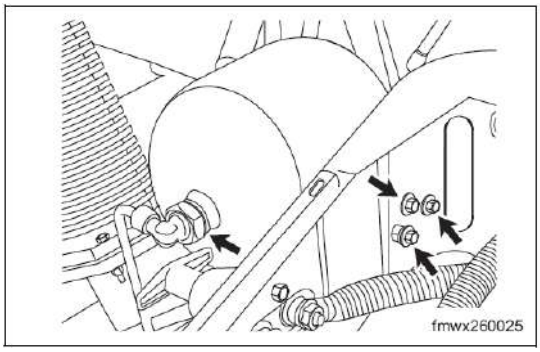
1	Rubber Hose with Fibre
2	Hose Clamp
3	Hex Head Bolt
4	Spring Washer
5	Big Washer
6	Oil-Gas Separator assembly
7	Hose Clamp

8	Hex Socket Cap Head Screw
9	Wave Spring Washer
10	Fixing Plate
11	Rubber Hose without Fibre
12	Gasket
13	Hex Nut, Style 1
14	Stud Bolt

Air Reservoir

Overhaul

1. Release the pressure of brake system

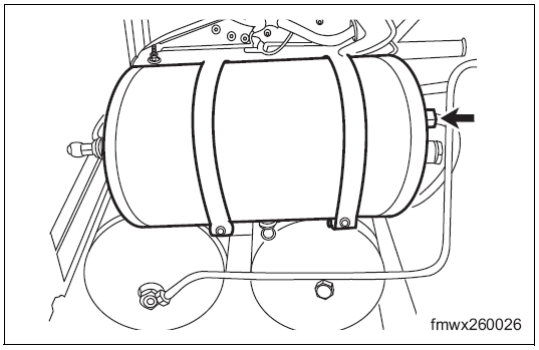


2. Dismantle the renewable air reservoir

(a). Dismantle the battery, refer to Chapter 53, Battery-Battery Assembly, Replacement.

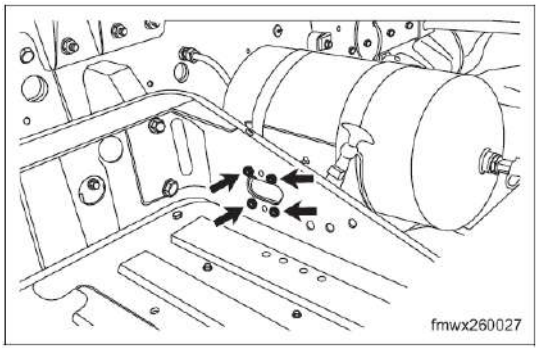
(b). Disconnect the air pipe of renewable air reservoir.

(c). Dismantle the fixing bolt of renewable air reservoir.

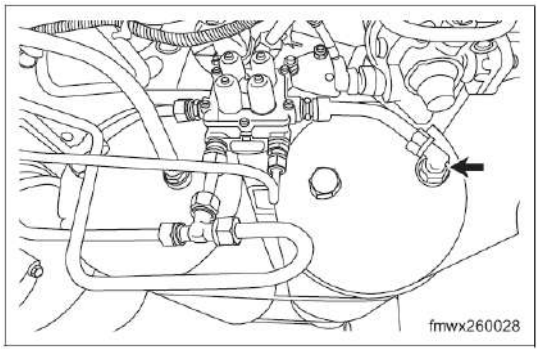


3. Dismantle the air reservoir of parking brake

(a). Disconnect the air pipe of the air reservoir of parking brake.

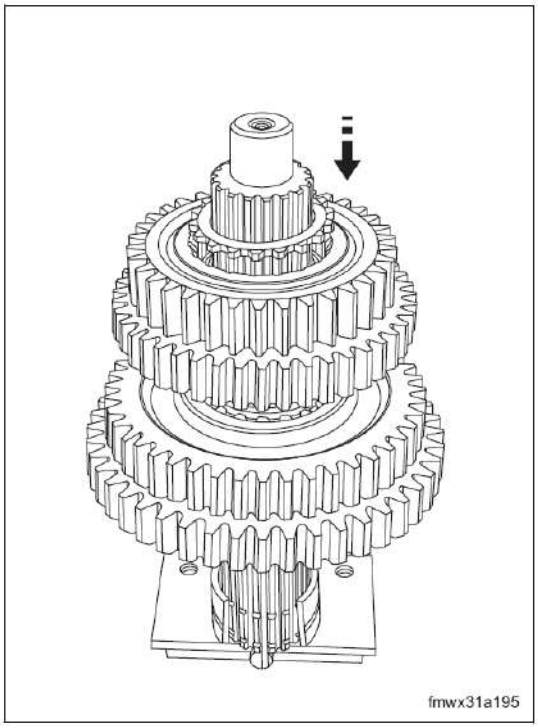


(b). Dismantle the fixing bolt of the air reservoir of parking brake.

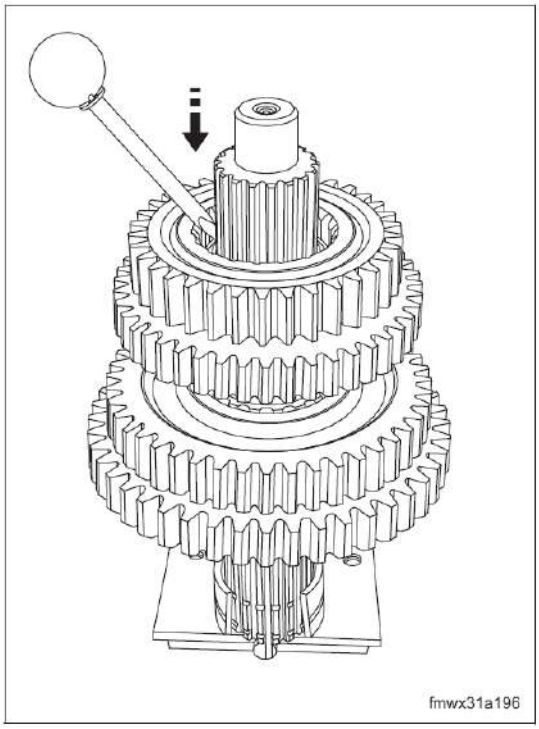


4. Dismantle the air reservoir of front axle brake

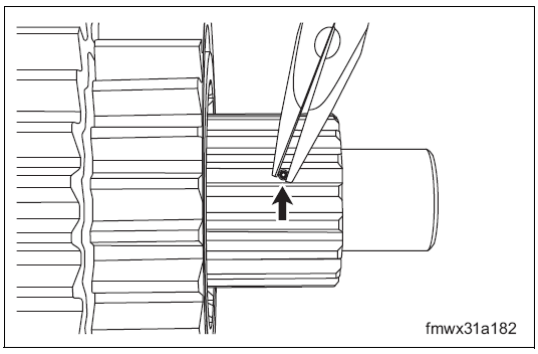
(a). Disconnect the air pipe of the air reservoir of front axle brake.



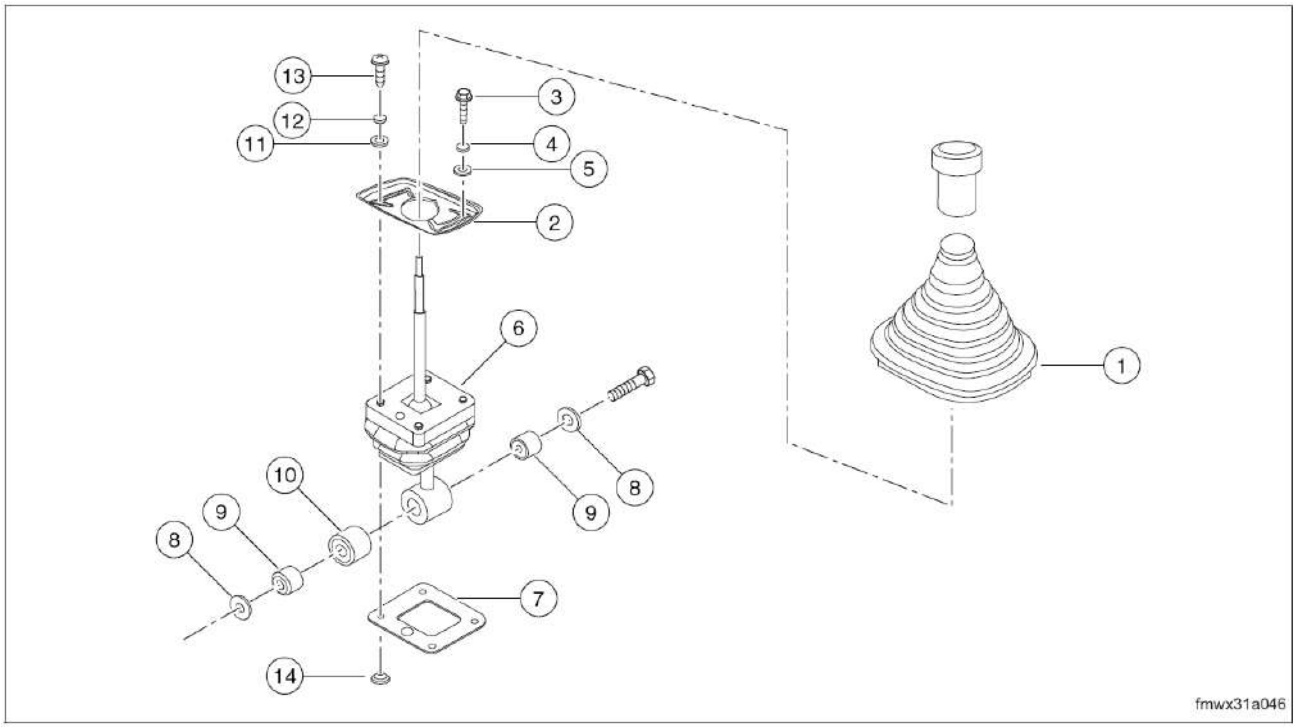
(j). Install the engaging ring gear of the main shaft 3rd gear upward on the main shaft, and install one spline gasket.



(k). Install one adjusting gasket with the convex side facing up, and push the long key after turning one angle.

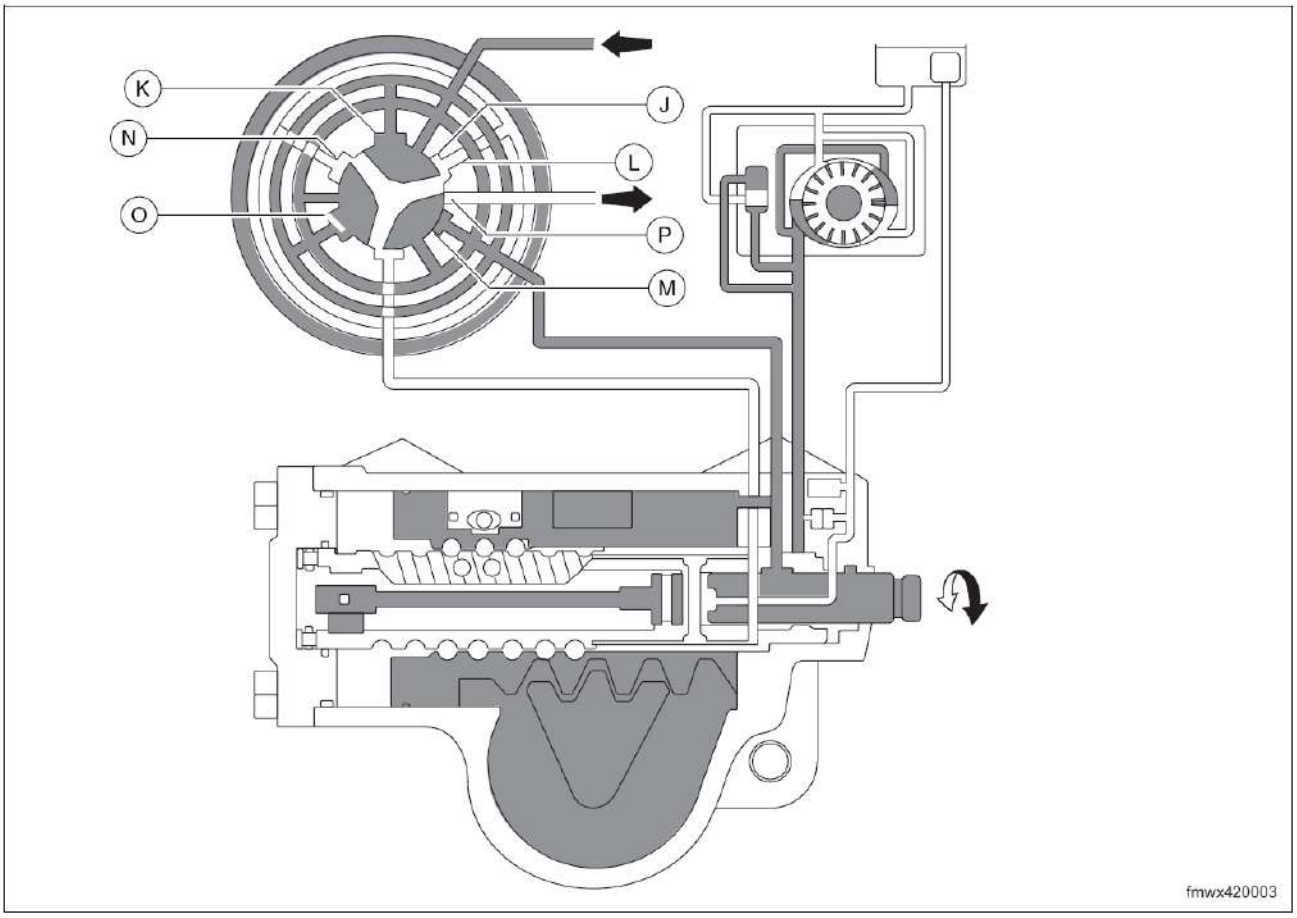


(l). Beat the elastic pin in the small hole on the main shaft, and install the 3rd/4th gear sliding sleeve.



1	Upper Dust Cover
2	Upper Pressure Plate
3	Hex Head Bolt
4	Flat Washer
5	Spring Washer
6	Operator Assembly
7	Lower Pressure Plate

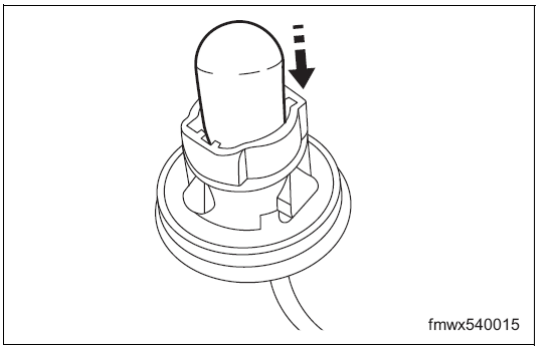
8	Sealing Gasket
9	Composite Bushing
10	Middle Spacer
11	Spring Washer
12	Flat Washer
13	Hex Head Bolt and External Teeth Serrated Lock Washer Assembly
14	Prevailing Torque Type All-metal Hex Nut with Flange



J	Oil Inlet Seam
K	Oil Inlet Seam
L	Oil return seam
M	Oil return seam

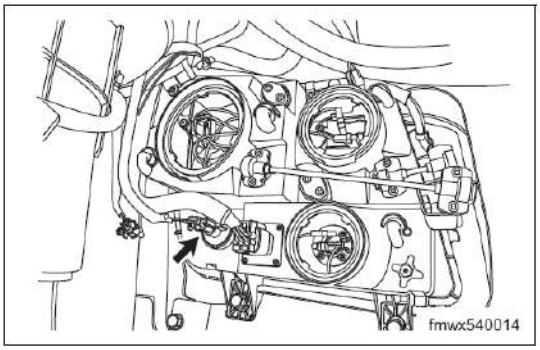
N	Axial Slot
O	Axial Slot
P	Oil Return Slot

A left and right limit valves are installed in the steering gear. The steering limit valves prevent the steering gear from steering the limit position by maximum working pressure; therefore, it protects the steering gear and the steering pump and prevents parts from damage due to high pressure and from oil temperature too high. Thus, it ensures the safety of parts in the limit position. When the hydraulic steering limit valve opens, the steering gear can strike outwardly; however, as the hydraulic boosting power effect is decreased dramatically, the steering force needed on the steering wheel increases significantly until it reaches the mechanical limit position of steering. As shown in following picture:

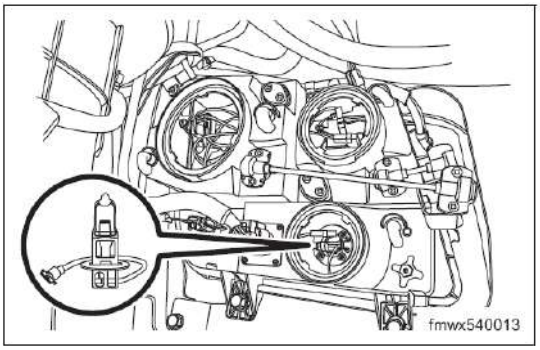


6. Install the left front turn signal lamp bulb.

(a). Install the turn signal lamp bulb.

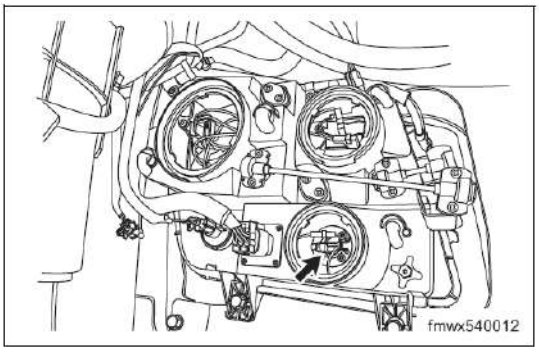


(b). Screw in the turn signal lamp holder.

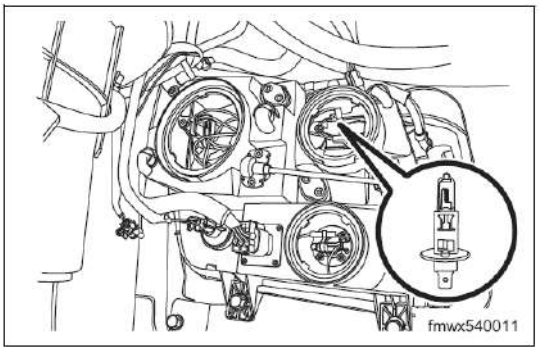


7. Install the left front fog lamp bulb.

(a). Install the fog lamp bulb, and clasp the steel buckle.



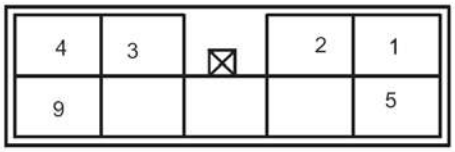
(b). Connect the connector, and install the sealing cover.



8. Install the left front high beam bulb.

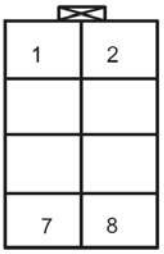
(a). Install the high beam bulb, and fasten the steel buckle.

Z019 To ABS Chassis Wiring Harness



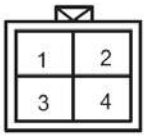
Pin No.	Wire Color	Feature	Remarks
1	B-Y	ABS Relay (L)	
2	G	Tractor ABS Interface SAE J1939 (B)	
3	W-B	ABS Relay (31)	
4	R-W	ABS Fuse (5A)	
5	B-Y	ABS Diagnostic Indicator Lamp (+)	
6	W	Tractor ABS Interface SAE J1939 (A)	
7		ABS Diagnostic Interface	
8	G-Y	ABS Indicator Light	
9	W-R	DBP Relay	

Z020 To TPM Switch



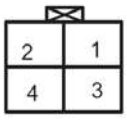
Pin No.	Wire Color	Feature	Remarks
1			Blank
2	W-B	TPM Switch (-)	
3			Blank
4	G-L	TPM Switch (+)	
5			Blank
6			Blank
7			Blank
8			Blank

Z022 Diagnostic Interface



Pin No.	Wire Color	Feature	Remarks
1	Y	ABS Diagnostic Interface K	
2	W-B	ABS Diagnostic Interface (-)	
3	Y-R	ABS Diagnostic Interface L	
4	B-W	ABS Diagnostic Interface (+)	

Z023 Diagnostic Interface



Pin No.	Wire Color	Feature	Remarks
1	Y	ABS Diagnostic Interface K	
2	W-B	ABS Diagnostic Interface (-)	
3	Y-R	ABS Diagnostic Interface L	
4	B-W	ABS Diagnostic Interface (+)	

Precautions - Cooling System.....14A-6, 14B-6, 14C-6
Precautions - Clutch Assembly..... 32-6
Precautions - Tire & Wheel Assembly..... 23-4
Precautions – Heater & Air Conditioner.... 04-330
Precautions - Heater & Air Conditioner 51-8
Precautions – Starting/Preheating System 04-276
Precautions – Starting & Preheating System... ... 18A-4, 18B-4, 18C-4
Precautions – Front Axle Assembly..... 24A-4, 24B-3
Precautions - Front Suspension Assembly..... 21-4
Precautions - Power Take-off..... . 34-7
Precautions – Fuel System..... 11A-12, 11B-12, 11C-8
Precautions - Lubrication System 15A-5, 15B-5, 15C-5
Precautions - Service Brake System 26-10
Precautions - Battery 53-5
Precautions – Hydraulic Dump System 91-19
Precautions - Dashboard..... . 73-3
Precautions - Audio System..... 04-501
Precautions - Audio System..... 56-3
Precautions - Wiper & Washer..... 55-3
Precautions - Lighting System..... 04-354
Precautions - Lighting System..... 54-3
Precautions - Intermediate Axle Assembly29A-4, 29B-3
Precautions - Parking Brake System..... 27-3
Precautions - Instrument Cluster 04-525
Precautions - Seat Assembly..... 74-3
Rotary Value (Mid-push T-type Dump Truck)..... 91-65
Tachometer Fault - Instrument Cluster.... 04-540
Turn Signal Lamp. 54-14
Turn Lamp and Warning Lamp are Off - Lighting System..... 04-395
Steering Pump Assembly. 42-24
Steering Gear Assembly (Right Rudder) 42-28
Steering Gear Assembly (Left Rudder) 42-25
Steering Fluid (Right Rudder) 42-22
Steering Fluid (Left Rudder) 42-20
Steering Fluid Reservoir Assembly..... 42-35
Steering Drag Link Assembly..... 42-36
Knuckle.....24A-12, 24B-11
Turn Signal Lamp Hazard Warning Lamp – Lighting 61-56
Steering Column (Right Rudder)..... 41-15
Steering Column (Left Rudder)..... .41-12
Preparation – Maintenance Guide 01-8
Preparations – Seat Belt..... .02-55
Preparations - Transmission (RT-11509C)..... 02-43
Preparations - Transmission (9JS135) 02-45
Preparations - Transmission (12JSD160) 02-47
Preparations – Glass, Window Lifter, Rear-view Mirror 02-61
Preparations - Frame 02-38
Preparations – Wheel and Tire 02-31
Preparations – Door, Lock, Door Handle 02-64
Preparations – Charging System (WP10).....02-26
Preparations - Charging System (WP12).....02-27
Preparations - Charging System (WD615).....02-28
Preparations – Drive Shaft 02-50
Preparations – Power Steering Mechanism 02-53
Preparations – Engine Mechanical (WP10).....02-16
Preparations - Engine Mechanical (WP12) 02-18
Preparations - Engine Mechanical (WD615).....02-20
Preparations - Engine Control 02-22
Preparations – Steering Wheel and Steering Column 02-52
Preparations – Rear Axle.....02-34
Preparations – Rear Suspension 02-30
Preparations - Cab 02-66
Preparations - Intake.....02-6
Preparations - Horn 02-60
Preparations - Clutch.....02-49
Preparations - Cooling (WP10) 02-10
Preparations - Cooling (WP12) 02-11
Preparations - Cooling (WD615).....02-12
Preparations – Interior & Exterior Trim Parts 02-65
Preparations – Heater and A/C 02-54
Preparations – Exhaust, Turbocharger (WP10) 02-7
Preparations - Exhaust, Turbocharger (WP12) 02-8
Preparations - Exhaust, Turbocharger (WD615)....02-9
Precautions – Exhaust System ... 13A-4, 13B-4, 13C-4
Preparations – Starting, Preheating System .....(WP10) 02-23
Preparations - Starting, Preheating System (WP12) 02-24
Preparations - Starting, Preheating System (WD615) 02-25
Preparations – Front Axle (Ankai).....02-32
Preparations – Front Axle (Triring) 02-33
Preparations – Front Suspension.. 02-29
Preparations – Power Take-off.. 02-51
Preparations - Fuel (WP10).....02-3
Preparations - Fuel (WP12).....02-4
Preparations - Fuel (WD615) 02-5
Preparations - Lubrication (WP10) 02-13
Preparations - Lubrication (WP12) 02-14
Preparations - Lubrication (WD615)..... 02-15
Preparations – Service Brake.....02-36
Preparations - Battery.. 02-56
Preparations – Hydraulic Dump System 02-67
Preparations – Cigarette Lighter on Dash.....02-62
Preparations – Audio System. 02-59