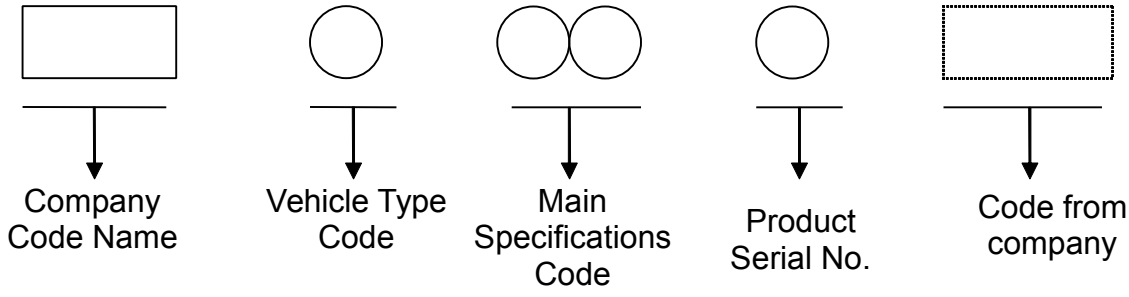
Vehicle Model



Company Code Name：HFC-----represents JAC motor

Vehicle Type Code：1---Cargo truck 2---Off-road vehicle 3---Dumper

4---Tractor 5---Special purpose vehicle 6---Passenger car

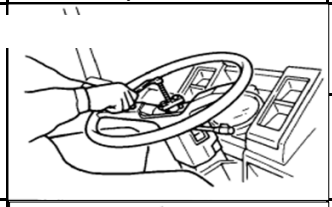
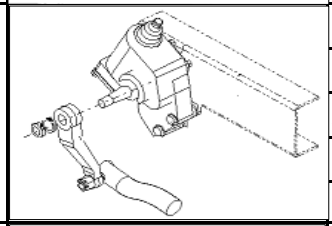
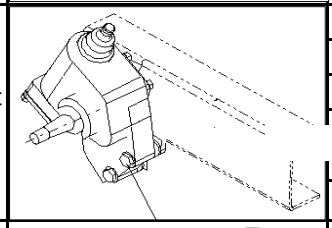
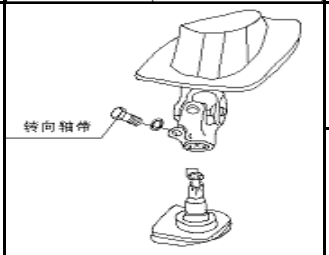
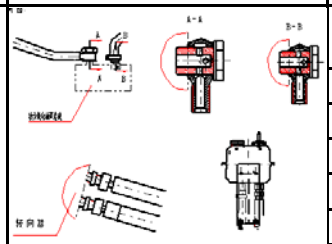
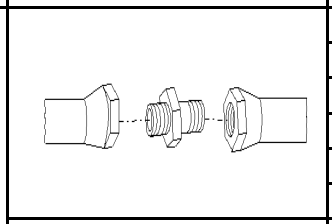
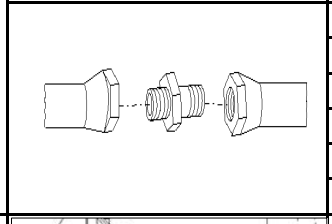
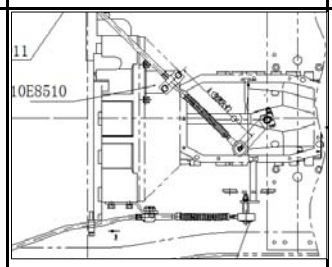
7---Sedan 9---Semitrailer

Main Specifications Code：25---represents the maximum gross weight is 25 tons.
Product serial No.： 1---Product development serial No.（1st change，2nd development）

Code from company：K---Diesel R1---King cabin

For example：HFC1061KR1 represents JAC vehicle with king cab, 6 tons maximum gross weight, the first change.

STANDARD TORQUE TABLE (JAC - All Models)

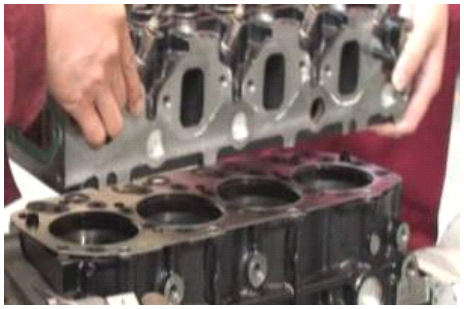
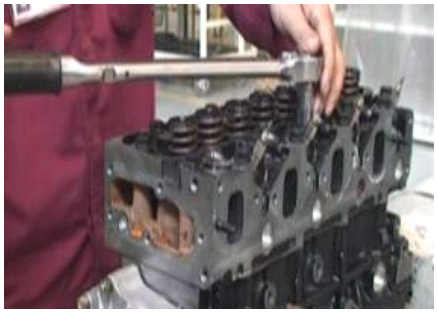
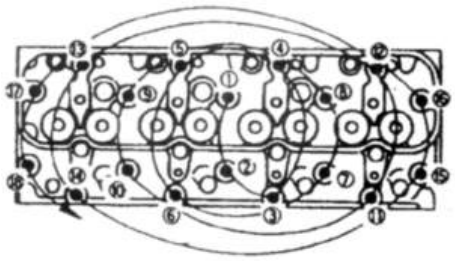
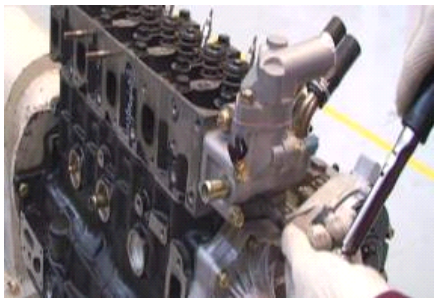
group	code	item	picture	Standard（N·m）
Steering system	1	steering wheel tightening nut		1020：54-69
				M20×1.5：60-79
	2	Connection of pitman arm and steering gear box		1020：54-69
				J1、E0、Z1、Z2：196-250
				A1、M1、Z15、E22CH：250-320
				M15、T0、T4：500-600
				M45×1.5:550-605
	3	connection of steering gear box,support and chassis		M10×1：65-95
				M12×1.25：108-161
				M14×1.5：146-205
				M16×1.5: 240-325
				M18×1.5: 397-507
				M20×1.5: 475-598
	4	connection of steering column steering gear box		M10：37-75
				M14×1.5: 50-55
	5	power steering pipe connection		Perforation bolt： according to the brake pipe system connection
				M14：53.9-73.5
				M16：88.3-118
				M18：100-130
				M20：100-130
				M22：130-160
				M24：160-200
Brake system	6	Brake pipe connection		Φ4.76 pipe：16-20
				Φ6 pipe：23-27
				Φ8 pipe：27-33
				Φ10 pipe：45-53
				Φ12 pipe：60-80
				Φ15 pipe：70-90
				Φ6 nylonpipe：22-25
				Φ8 nylonpipe：25-32
				Φ10 nylonpipe：37-42
				Φ12 nylonpipe：46-52
				Φ16 nylonpipe：59-67
				Φ20 nylonpipe：64-72
	7	brake draw bench equipment		by eyes, to make the spring mat flat

Section V Tightening Torque for Critical Bolts of Engine

☆ Comparison Table of Tightening Torque for Critical Bolts

No.	Description	N. m
1	Fixing bolt of rockshaft	55
2	Heater plug	25
3	Nut and washer for fuel injector body	40
4	Fuel injector	34
5	Fixing bolt of thermostat housing assembly	25
6	Installation torque of rocker arm assembly	55
7	Camshaft thrust plate bolt	25
8	Camshaft timing gear bolt	110
9	Fixing bolt of rockshaft	50
10	Fixing bolt of engine oil pump filter screen assembly	20
11	Engine oil pump fixing bolt	20
12	Oil sump bolt	23.5
13	Flywheel baffle bolt	85
14	Flywheel bolt	25 for first step 70 for second step 120 for third step
15	Crankshaft bearing cap bolt	20 for first step 110 for second step 170 for third step
16	Tightening bolt of engine oil pump	25
17	Socket nut of engine oil pump	30
18	Torque for cylinder head bolt:	65 for first step 85 for second step 105 for third step
19	Rockshaft support bolt	55
20	Main bearing cap bolt	170
21	Torque for drive shaft nut	66
22	Transmission bracket nut	69
23	Clutch cover – flywheel housing bolt	M10：46 M12：91
24	Engine rear bracket nut and bolt	M10：40 M12：69
25	Front exhaust pipe bolt	37
26	Clutch working cylinder bolt	19

No.	Name	Standard Size (mm)	Fitting nature	Assembly Clearance for New Engine (mm)	Wear Limit (mm)
	Name	Standard Size (mm)	Fitting nature	Assembly Clearance for New Engine (mm)	Wear Limit (mm)
13	Protrusion height of cylinder sleeve	0～0.08			
14	Axial run-out clearance of camshaft		Clearance	0.05～0.13	0.20
	Cam height of camshaft	42.02±0.05			0.38
15	Inside diameter of camshaft bush	$\Phi 50^{+0.025}_{0}$	Clearance	0.025～0.080	0.12
	Diameter of camshaft journal	$\Phi 50^{-0.025}_{-0.055}$			
16	Deflection of cam bush			0.02	0.1
17	Outside diameter of piston pin	$\Phi 34^{0}_{-0.005}$	Clearance	0.002～0.015	0.03
	Piston pin bore	$\Phi 34^{+0.010}_{+0.002}$			
18	Thickness of connecting rod large end	$\Phi 33^{0}_{-0.07}$	Clearance	0.175～0.320	0.35
	Opening of crankshaft connecting rod journal	$\Phi 33^{+0.250}_{+0.175}$			
19	Clearance of intake and exhaust valves (cold state)		Clearance	0.3～0.4	
20	Main journal	$\Phi 70^{-0.068}_{-0.086}$	Clearance	0.031～0.066	0.11
	Main bush bore (after assembly)	$\Phi 70^{-0.003}_{-0.033}$			
21	Outside diameter of piston pin	$\Phi 34^{0}_{-0.036}$	Clearance	0.008～0.026	0.05
	Inside diameter of connecting rod bush	$\Phi 34^{+0.020}_{+0.038}$			
22	Crankshaft connecting rod journal	$\Phi 53^{-0.070}_{-0.085}$	Clearance	0.029～0.069	0.1
	Connecting rod bush bore (after assembly)	$\Phi 53^{-0.016}_{-0.041}$			
23	Grouping of piston outside diameter		Grouping clearance	0.053～0.075	
	Group A	92.957～92.968			
	Group B	92.968～92.979			
	Group C	92.979～92.990			
	Group D	92.990～93.001			

		b. Install the cylinder head onto the cylinder block.
 		c. Immerse the thread portion of cylinder head bolts into oil and ıder head and pre-tighten. d. Tighten the cylinder head bolts by steps from the center to two sides as per the specified sequence: 65N.m→85N.m→105N.m
		e. Install the thermostat housing and water outlet assembly and tighten the fixing bolts and hexagon socket fixing bolts.

VI. Common malfunctions and troubleshooting for low pressure fuel line

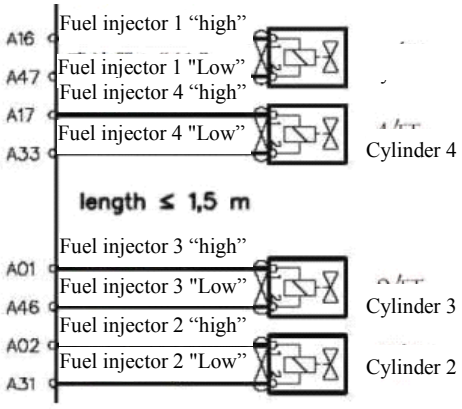
No.	Malfunction	Troubleshooting	Remarks
1	Weak pumping of fuel	Retighten the connectors (temperature sensor, plug, and pile connector), in order to prevent the pumping failure due to ingress of air. If ineffective, replace the manual pump.	The tightening torque for connectors is 30-35N.m. Higher torque will lead to thread failure.
2	Fuel leakage of air bleeding screw	Check the screw hole of manual pump for presence of thread failure. If yes, replace the transitional thread insert and air bleeding screw and washer.	The tightening torque is 7~9N.m. Higher torque will lead to thread failure. While assembling the transitional thread insert, of thread sealant onto the thread. Prevent the ingress of sealant into the manual pump.
3	Fuel leakage of manual pump	Replace the manual pump	The knocking or improper use will lead to fuel leakage of manual pump
4	Slow acceleration and difficult start due to difficult fuel supply	The filter is blocked. Replace the filter. If the malfunction still occurs after replacement of fuel filter, check other engine parts.	The blockage of fuel filter will increase the pressure difference.
5	Failure for timely water drainage	Make sure to drain the water when the water level sensor indicator lamp lights up.	If the water is not drained, the water content in fuel will increase to impair the engine performance.
6	Light-up failure of water level sensor indicator lamp at engine start	1. Water level sensor is damaged. 2. Indicator lamp is damaged. 3. Circuit malfunction	
7	Working failure of heater	1. The heater is damaged. 2. Circuit malfunction 3. Low battery current 4. The heater is punctured due to high current	
8	Working failure of temperature sensor	Damage o temperature sensor Circuit malfunction	

closes the fuel drainage hole. The armature is of two-part design. Though the armature block is guided by the pressure shoulder during the downward movement, it can bounce back following the return spring and thus will not apply downward force onto the armature and the ball valve.

The close of fuel drainage hole enables the entry of fuel via fuel inlet hole into the control chamber for pressure establishment. This pressure is equivalent to the rail pressure and applies additional force onto the end face of the control plunger. The resultant force from this force and spring force overcomes the pressure in the injector nozzle chamber to close the injector nozzle needle valve.

The close speed of the injector nozzle needle valve depends on the flow passing through the fuel inlet hole. Once the injector nozzle needle valve hits its lower seat again, the fuel injection stops.

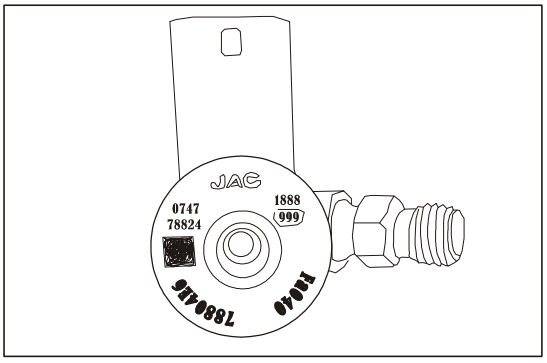
3) Measurement analysis



4) Matching of fuel injector

The matching of fuel injector must be performed in event of any of the following conditions:

- Replacement of fuel injector.
- Replacement of ECU
- Confusion of installation serial number before and after the maintenance.

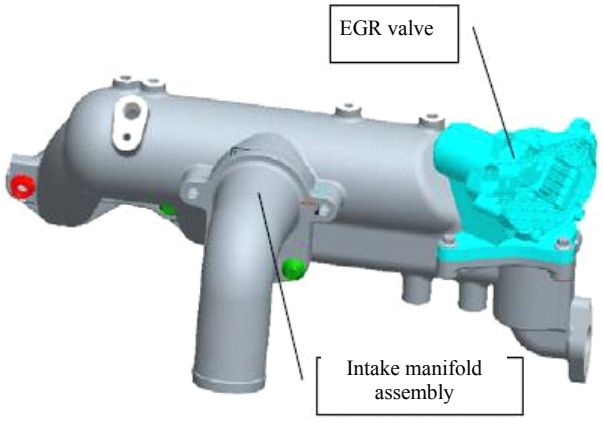


While performing the matching, input the matching code on the fuel injector (as shown in the figure) in order into the diagnosis instrument for matching.

2. EGR valve control system

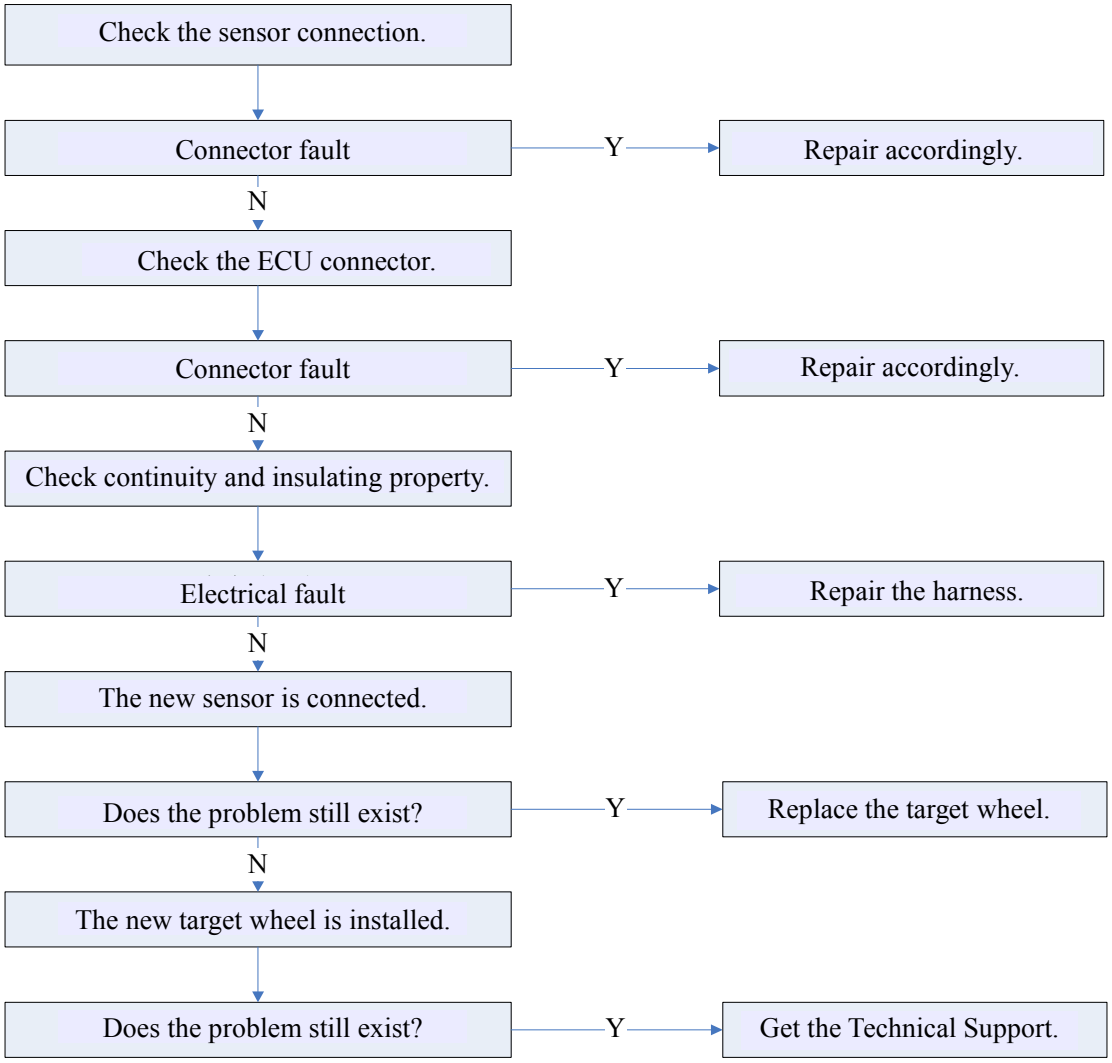
1) Overview

- The electronically controlled EGR valve controls the open extent of the valve by means of the positive and reverse rotation of the DC motor and performs the close-loop control as per the feedback signal of the position sensor.
- To guarantee the NOx emission of the engine, the ECU measures and calculates the EGR percentage as per the input parameters of the engine (such as speed and intake pressure) and the calibrated MAPs), issues control signal to the EGR valve, and performs the close-loop control via the position sensor.

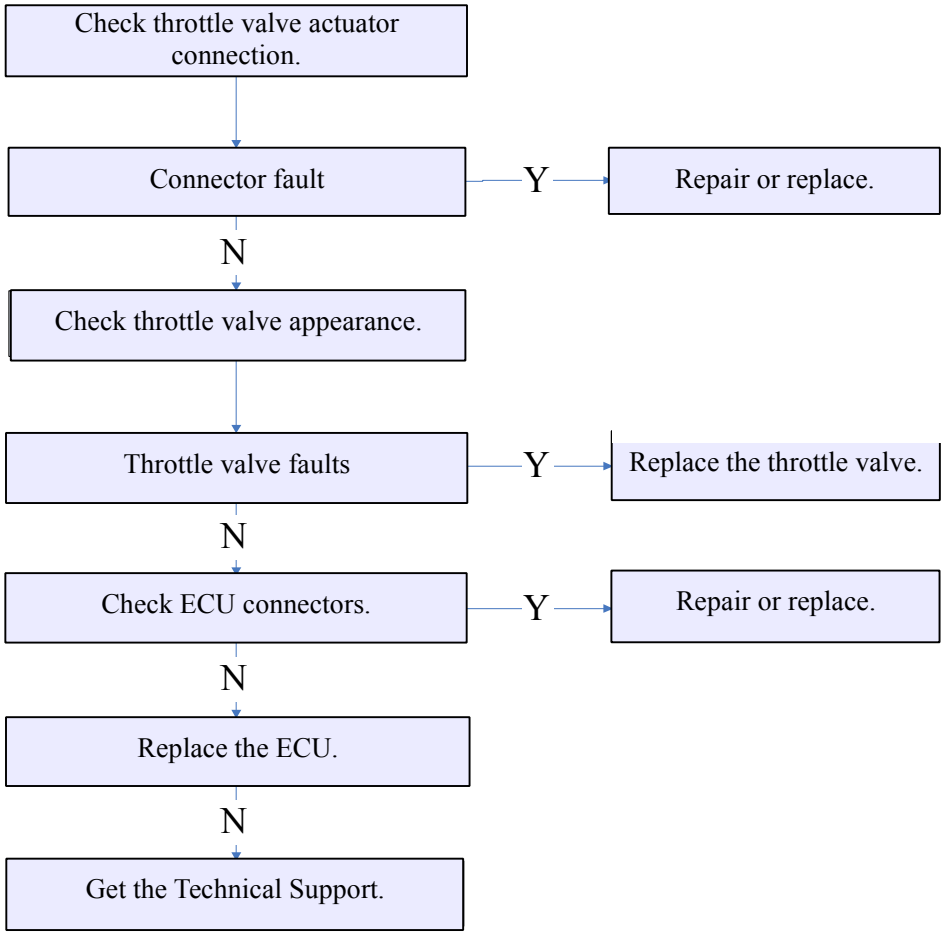


- The EGR valve is installed on the intake manifold. The constant temperature of the EGR valve inlet emission

S/N	DTC	Meaning
290	P121F	6th cylinder IQA error
291	P1220	The signal level of intercooler downstream temperature sensor is relatively high.
292	P1221	The signal level of intercooler downstream temperature sensor is relatively low.
293	P122A	The positive deviation of throttle controller exceeds the upper limit for a long time.
294	P122B	The negative deviation of throttle controller is below the lower limit for a long time.
295	P1230	Error reported in monitoring the OBDII maximum threshold correction
296	P1231	Error reported in monitoring the OBDII minimum threshold correction
297	P1245	System degradation information
298	P1250	An error is triggered when the ET time of the 1st cylinder reaches the maximum limit (when the ZEL comes into effect).
299	P1251	An error is triggered when the ET time of the 2nd cylinder reaches the maximum limit (when the ZEL comes into effect).
300	P1252	An error is triggered when the ET time of the 3rd cylinder reaches the maximum limit (when the ZEL comes into effect).
301	P1253	An error is triggered when the ET time of the 4th cylinder reaches the maximum limit (when the ZEL comes into effect).
302	P1254	An error is triggered when the ET time of the 1st cylinder reaches the minimum limit (when the ZEL comes into effect).
303	P1255	An error is triggered when the ET time of the 2nd cylinder reaches the minimum limit (when the ZEL comes into effect).
304	P1256	An error is triggered when the ET time of the 3rd cylinder reaches the minimum limit (when the ZEL comes into effect).
305	P1257	An error is triggered when the ET time of the 4th cylinder reaches the minimum limit (when the ZEL comes into effect).
306	P1400	EGR valve circuit is open.
307	P1401	Overtemperature of EGR valve bridge-H chip
308	P1402	EGR valve circuit is short to power supply.
309	P1403	EGR valve circuit is short to ground.
310	P140A	The signal level of the EGR cooler downstream temperature is relatively high.
311	P140B	The signal level of the EGR cooler downstream temperature is relatively low.
312	P1410	The positive deviation of throttle controller exceeds the upper limit for a long time.
313	P1411	The negative deviation of throttle controller is below the lower limit for a long time.
314	P1415	The time for transforming from RGN to NRM mode is too long.
315	P1418	The indicator actuator circuit for EGR bypass regulating valve is open.
316	P1419	Overheating of indicator actuator for EGR bypass regulating valve
317	P141A	The indicator actuator circuit for EGR bypass regulating valve is short to battery.
318	P141B	The indicator actuator circuit for EGR bypass regulating valve is short to ground.


Check the sensor connection.
Connector fault
Y
Repair accordingly.
N
Check the ECU connector.
Connector fault
Y
Repair accordingly.
N
Check continuity and insulating property.
Electrical fault
Y
Repair the harness.
N
The new sensor is connected.
Does the problem still exist?
Y
Replace the target wheel.
N
The new target wheel is installed.
Does the problem still exist?
Y
Get the Technical Support.

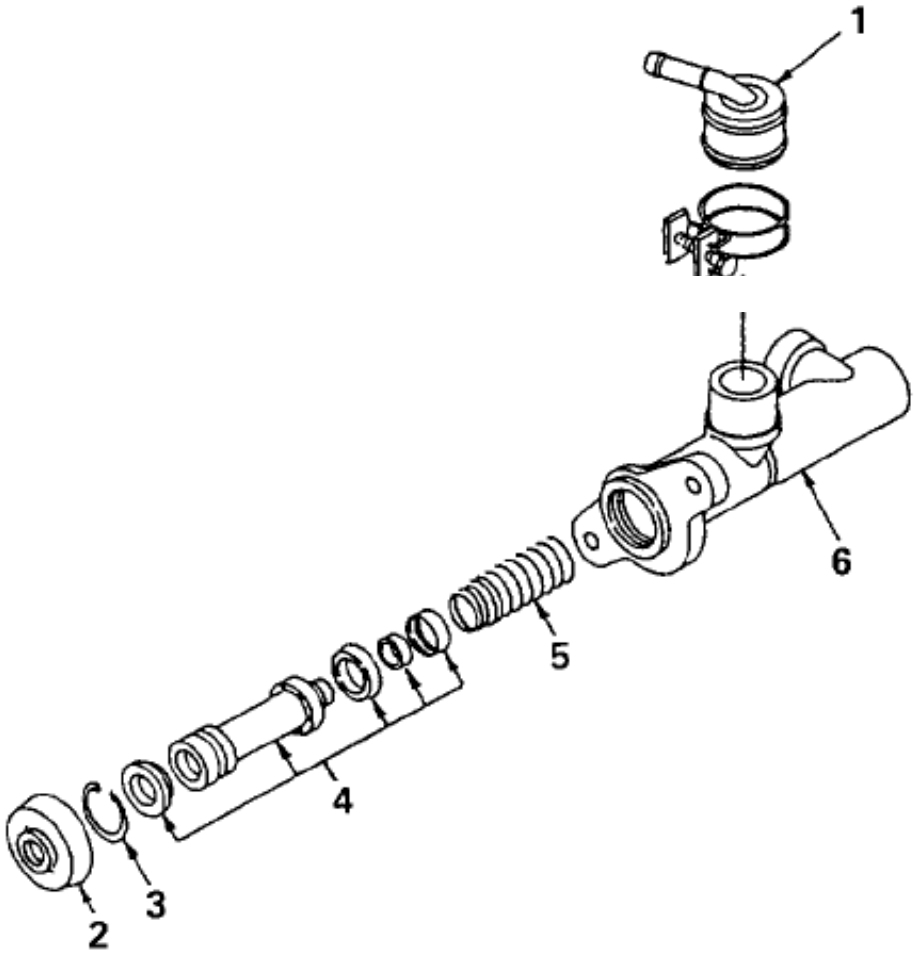
12.


Check throttle valve actuator connection.
Connector fault
Y
Repair or replace.
N
Check throttle valve appearance.
Throttle valve faults
Y
Replace the throttle valve.
N
Check ECU connectors.
Y
Repair or replace.
N
Replace the ECU.
N
Get the Technical Support.

28.

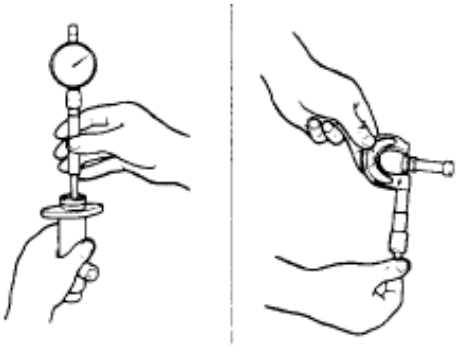
Clutch main cylinder

Disassembly



Disassembly sequence

1. Pipe tie-in 2. Handspike fork 3. Locking nut 4. Dustproof cover 5. Clamp ring
6. Limit block 7. Handspike 8. Piston assembly 9. Return spring 10.Pump body



Inspection and repair

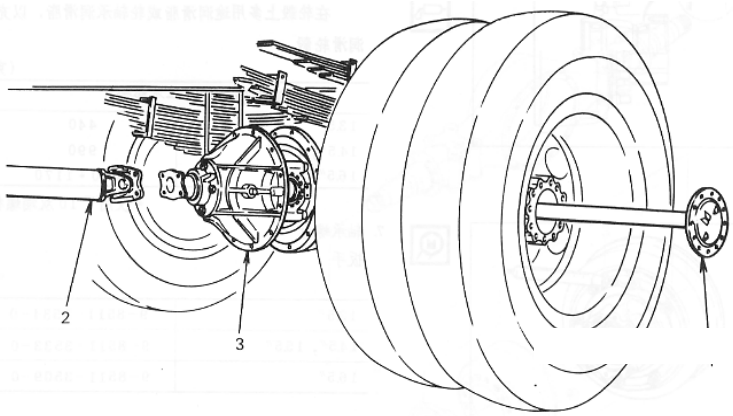
Measure the inner diameter of main pump body.

Inner diameter of main pump body ：19.050---19.102mm

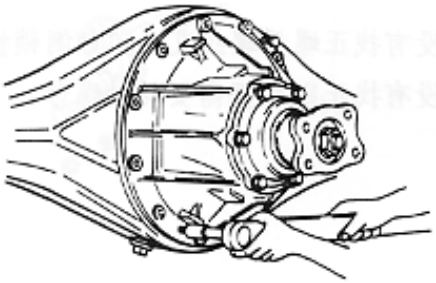
Clearance between clutch main pump piston and inner diameter of main pump body: 0.12mm(limit)

Main retarder

Disassembly and assembly



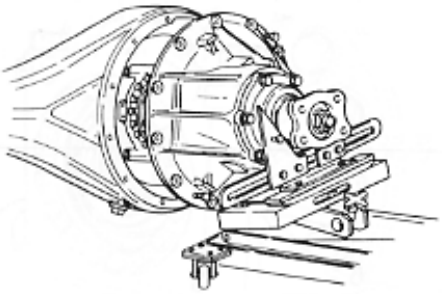
Disassembly sequence 1．Transmission shaft 2．Half shaft 3．Main retarder assembly
Assembly sequence 1．Main retarder assembly 2．Half shaft 3．Transmission shaft



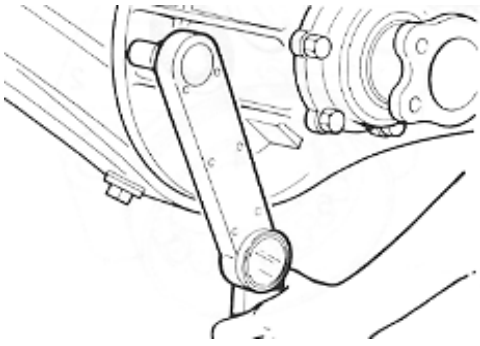
Important works

Dismantle main retarder assembly

1. Dismantle the nuts on main retarder shell
2. Screw the bolts into thread hole of main retarder shell, and turn the bolts to loosen main retarder assembly.



3. Use transmission jack to move main retarder assembly.

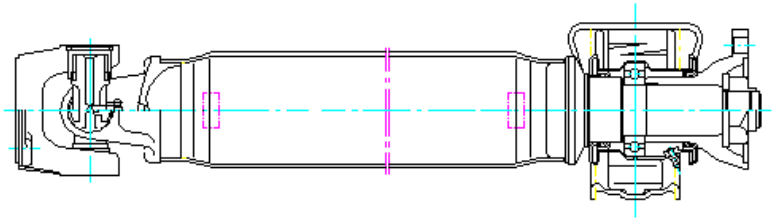


Assembly

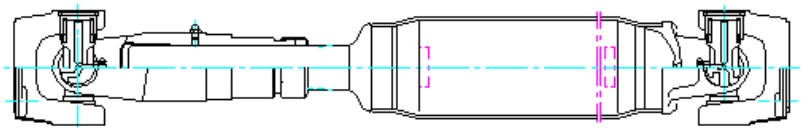
Tightening torque of fixed nuts of main retarder shell 6－8 kgf.m

Tightening torque of transmission shaft assembly 7--9kgf.m

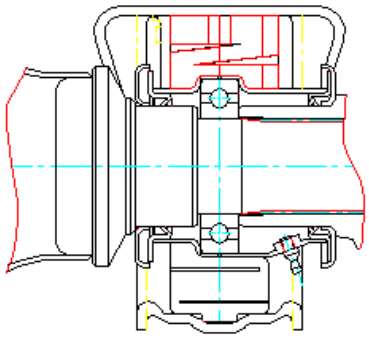
General



Intermediate drive shaft assembly



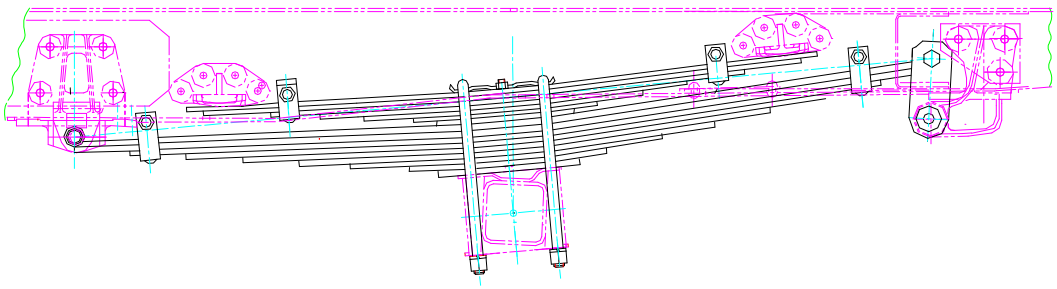
Rear drive shaft assembly



Intermediate supporting assembly

REAR SUSPENSION

General



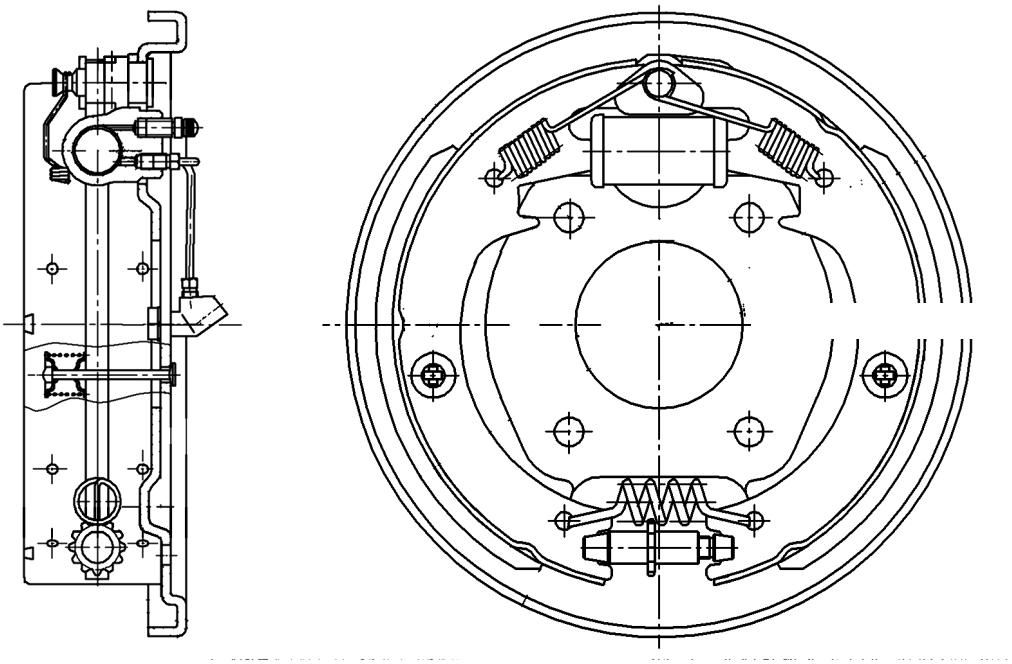
Specifications

Serial No.	Main spring		
	L (mm)	W (mm)	D (mm)
1	1300	70	10
2	1320	70	10
3	1140	70	8
4	970	70	8
5	800	70	8
6	630	70	8
7	300	70	8
8	300	70	8

Serial No.	Auxiliary spring		
	L (mm)	W (mm)	D (mm)
1	960	70	7
2	910	70	7
3	710	70	7
4	560	70	7
5	420	70	7
6	270	70	7
7	170	70	7

General

Brake



Main data and specifications

Item			
Type			Front brake: dual self-servo brake
Inner diameter of brake drum		(mm)	
	：front		310
	：rear		310
Brake main cylinder			
	：inner diameter	(mm)	28.58
	：travel	(mm)	⩾32
Wheel brake cylinder			
inner diameter	：front	(mm)	28.58
	：rear	(mm)	28.58
Vacuum booster			
Diameter of film sheet		(mm)	230
Free travel		(mm)	34
Panel free travel		(mm)	5—8
Brake liquid			Synthetic brake liquid Accord with the JG3 requirement in GB10830 “Using technical conditions for vehicle brake liquid”.