

## GENERAL REPAIR INSTRUCTIONS

1. Park the vehicle on level ground and chock the front or rear wheels before lifting the vehicle.
2. Raise the vehicle with a jack set against the axle or the frame.
3. Support the vehicle on chassis stands.
4. Use covers on the vehicle body, seats, and floor to prevent damage and/or contamination.
5. Disconnect the grounding cable from the battery before performing service operations.  
This will prevent cable damage or burning due to short circuiting.
6. Handle brake fluid and antifreeze solution with great care.  
Spilling these liquids on painted surfaces will damage the paint.
7. The use of the proper tool(s) and special tool(s) where specified is essential to efficient, reliable, and safe service operations.
8. Always use genuine ISUZU replacement parts.
9. Discard used cotter pins, gaskets, O-rings, oil seals, lock washers, and self-locking nuts at disassembly.  
Normal function of these parts cannot be guaranteed if they are reused.
10. Prepare new cotter pins, gaskets, O-rings, oil seals, lock washers, and self-locking nuts for installation.
11. Keep the disassembled parts neatly in groups.  
This will facilitate smooth and correct reassembly.
12. Keep fixing nuts and bolts separate.  
Fixing nuts and bolts vary in hardness and design according to installation position.
13. Clean all parts before inspection or reassembly.
14. Clean the oil ports and other openings with compressed air to make certain that they are free from dirt and obstructions.
15. Lubricate the rotating and sliding faces of all moving parts with oil or grease before installation.
16. Use the recommended liquid gasket to prevent leakage.
17. Carefully observe all nut and bolt torque specifications.
18. When removing or replacing parts that require refrigerant to be discharged from the Air conditioning system, be sure to use the Vehicle Refrigerant Recovery and Recycling Equipment (VRRRE) to recover and recycle R134a, to promote the movement for the protection of the ozone layer covering the earth.
19. Check and recheck your work. No service operation is complete until you have done this.

**0A-12 GENERAL INFORMATION**

**VOLUME**

**GALLONS (U.S.) TO LITERS**

U.S. gal.	0	1	2	3	4	5	6	7	8	9	U.S. gal.
	liters	liters	liters	liters	liters	liters	liters	liters	liters	liters	
-		3.7854	7.5709	11.3563	15.1417	18.9271	22.7126	26.4980	30.2834	34.0633	-
10	37.8543	41.6397	45.4251	49.2105	52.9960	56.7814	60.5668	64.3523	68.1377	71.9231	10
20	75.7085	79.4940	83.2794	87.0648	90.8502	94.6357	98.4211	102.2065	105.9920	109.7774	20
30	113.5629	117.3482	121.1337	124.9191	128.7045	132.4901	136.2754	140.0608	143.8462	147.6316	30
40	141.4171	155.2025	158.9879	162.7734	166.5588	170.3442	174.1296	177.9151	181.7005	185.4859	40
50	189.2713	193.0568	196.8422	200.6276	204.4131	208.1985	211.9839	215.7693	219.5548	223.3402	50
60	227.1256	230.9110	234.6965	238.4819	242.2673	246.0527	249.8382	253.6236	257.4090	261.1945	60
70	264.9799	268.7653	272.5507	276.3362	280.1216	283.9070	287.6924	291.4779	295.2633	299.0487	70
80	302.8342	306.6196	310.4050	314.1904	317.9759	321.7613	325.5467	329.3321	333.1176	336.9030	80
90	340.6884	344.4738	348.2593	352.0447	355.8301	359.6156	363.4010	367.1864	370.9718	374.7573	90
100	378.5427	382.3281	386.1135	389.8990	393.6844	397.4698	401.2553	405.0407	408.8261	412.6115	100

**LITERS TO GALLONS (U.S.)**

liters	0	1	2	3	4	5	6	7	8	9	liters
	gal.	gal.	gal.	gal.	gal.	gal.	gal.	gal.	gal.	gal.	
-		0.2642	0.5283	0.7925	1.0567	1.3209	1.5850	1.8492	2.1134	2.3775	-
10	2.6417	2.9059	3.1701	3.4342	3.6984	3.9626	4.2268	4.4909	4.7551	5.0193	10
20	5.2834	5.5476	5.8118	6.0760	6.3401	6.6043	6.8685	7.1326	7.3968	7.6610	20
30	7.9252	8.1893	8.4535	8.7177	8.9818	9.2460	9.5102	9.7743	10.0385	10.3027	30
40	10.5669	10.8311	11.0952	11.3594	11.6236	11.8877	12.1519	12.4161	12.6803	12.9444	40
50	13.2086	13.4728	13.7369	14.0011	14.2653	14.5295	14.7936	15.0578	15.3220	15.5861	50
60	15.8503	16.1145	16.3787	16.6428	16.9070	17.1711	17.4354	17.6995	17.9637	18.2279	60
70	18.4920	18.7562	19.0204	19.2846	19.5487	19.8129	20.0771	20.3412	20.6054	20.8696	70
80	21.1338	21.3979	21.6621	21.9263	22.1904	22.4546	22.7188	22.9830	23.2471	23.5113	80
90	23.7755	24.0397	24.3038	24.5680	24.8322	25.0963	25.3605	25.6247	25.8889	26.1530	90
100	26.4172	26.6814	26.9455	27.2097	27.4739	27.7381	28.0022	28.2664	28.5306	28.7947	100

**GALLONS (IMP.) TO LITERS**

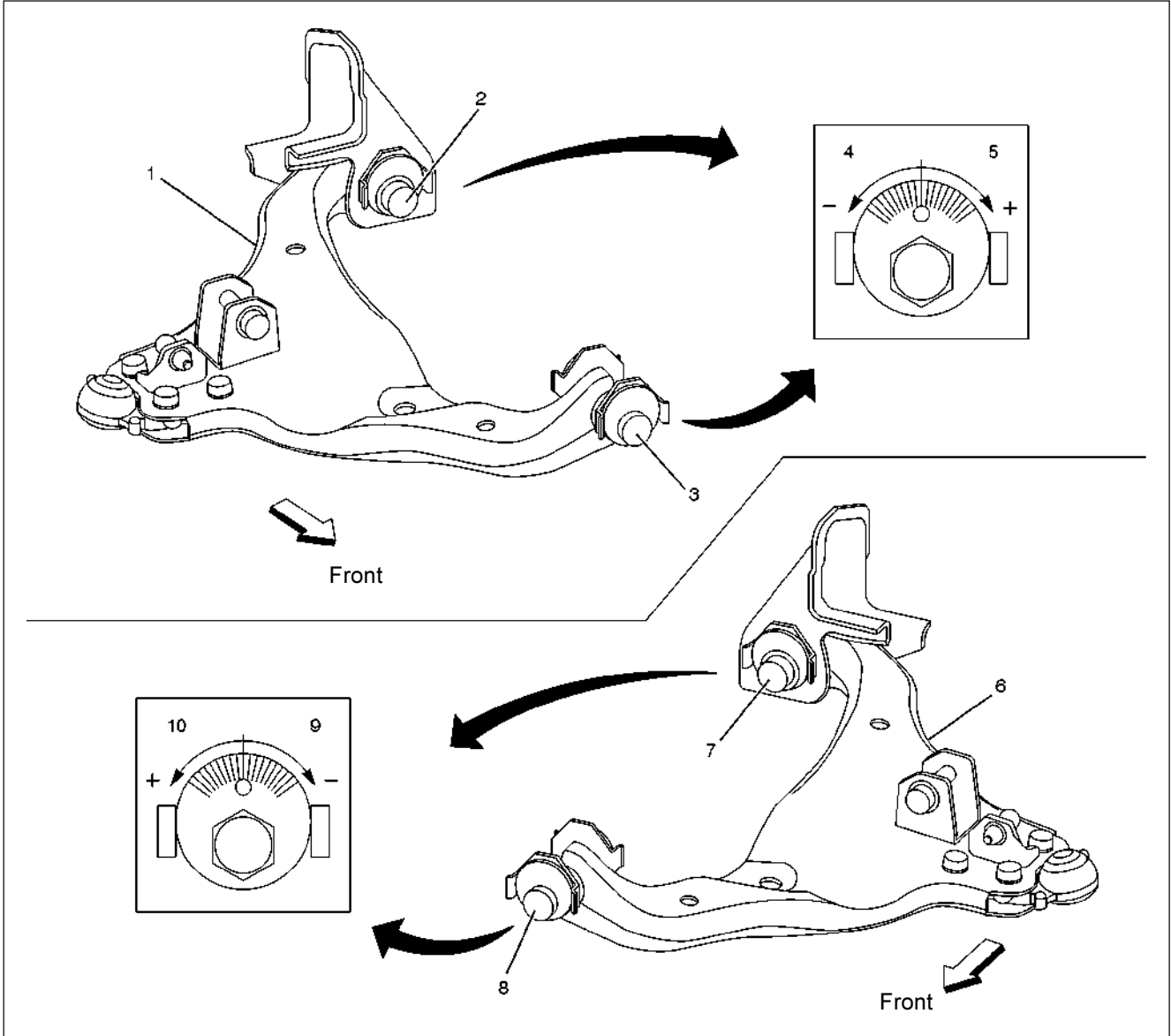
Imp gal.	0	1	2	3	4	5	6	7	8	9	Imp gal.
	liters	liters	liters	liters	liters	liters	liters	liters	liters	liters	
-		4.5459	9.0918	13.6377	18.1836	22.7295	27.2754	31.8213	36.3672	40.9131	-
10	45.4590	50.0049	54.5508	59.0967	63.6426	68.1885	72.7344	77.2803	81.8262	86.3721	10
20	90.9180	95.4639	100.0098	104.5557	109.1016	113.6475	118.1934	122.7393	127.2852	131.8311	20
30	136.3770	140.9229	145.4688	150.0147	154.5606	159.1065	163.6524	168.1983	172.7442	177.2901	30
40	181.8360	186.3819	190.9278	195.4737	200.0196	204.5655	209.1114	213.6573	218.2032	222.7491	40
50	227.2950	231.8409	236.3868	240.9327	245.4786	250.0245	254.5704	259.1163	263.6622	268.2081	50
60	272.7540	277.2999	281.8458	286.3917	290.9376	295.4835	300.0294	304.5753	309.1212	313.6671	60
70	318.2130	322.7589	327.3048	331.8507	336.3966	340.9425	345.4884	350.0343	354.5802	359.1261	70
80	363.6720	368.2179	372.7638	377.3097	381.8556	386.4015	390.9474	395.4933	400.0392	404.5851	80
90	409.1310	413.6769	418.2228	422.7687	427.3146	431.8605	436.4064	440.9523	445.4982	450.0441	90
100	454.5900	459.1359	463.6818	468.2277	472.7736	477.3195	481.8654	486.4113	490.9572	495.5031	100

**LITERS TO GALLONS (IMP.)**

liters	0	1	2	3	4	5	6	7	8	9	liters
	gal.	gal.	gal.	gal.	gal.	gal.	gal.	gal.	gal.	gal.	
-		0.2200	0.4400	0.6599	0.8799	1.0999	1.3199	1.5399	1.7598	1.9798	-
10	2.1998	2.4198	2.6398	2.8597	3.0797	3.2997	3.5197	3.7397	3.9596	4.1796	10
20	4.3996	4.6196	4.8396	5.0595	5.2795	5.4995	5.7195	5.9395	6.1594	6.3794	20
30	6.5994	6.8194	7.0394	7.2593	7.4793	7.6993	7.9193	8.1393	8.3592	8.5792	30
40	8.7992	9.0192	9.2392	9.4591	9.6791	9.8991	10.1191	10.3391	10.5590	10.7790	40
50	10.9990	11.2190	11.4390	11.6590	11.8789	12.0989	12.3189	12.5389	12.7588	12.9788	50
60	13.1988	13.4188	13.6388	13.8587	14.0787	14.2987	14.5187	14.7387	14.9586	15.1786	60
70	15.3986	15.6186	15.8386	16.0585	16.2785	16.4985	16.7185	16.9385	17.1584	17.3784	70
80	17.5984	17.8184	18.0384	18.2583	18.4783	18.6983	18.9183	19.1383	19.3582	19.5782	80
90	19.7982	20.0182	20.2382	20.4581	20.6781	20.8981	21.1181	21.3381	21.5580	21.7780	90
100	21.9980	22.2180	22.4380	22.6579	22.8779	23.0979	23.3179	23.5379	23.7578	23.9778	100

**Alignment for 4x2 (Except High Ride Suspension)  
Caster and camber Adjustment**

The lower links of the 4 X2 vehicle front suspension have an adjusting cam at either end (front and rear). This permits simultaneous adjustment of camber and caster angle.



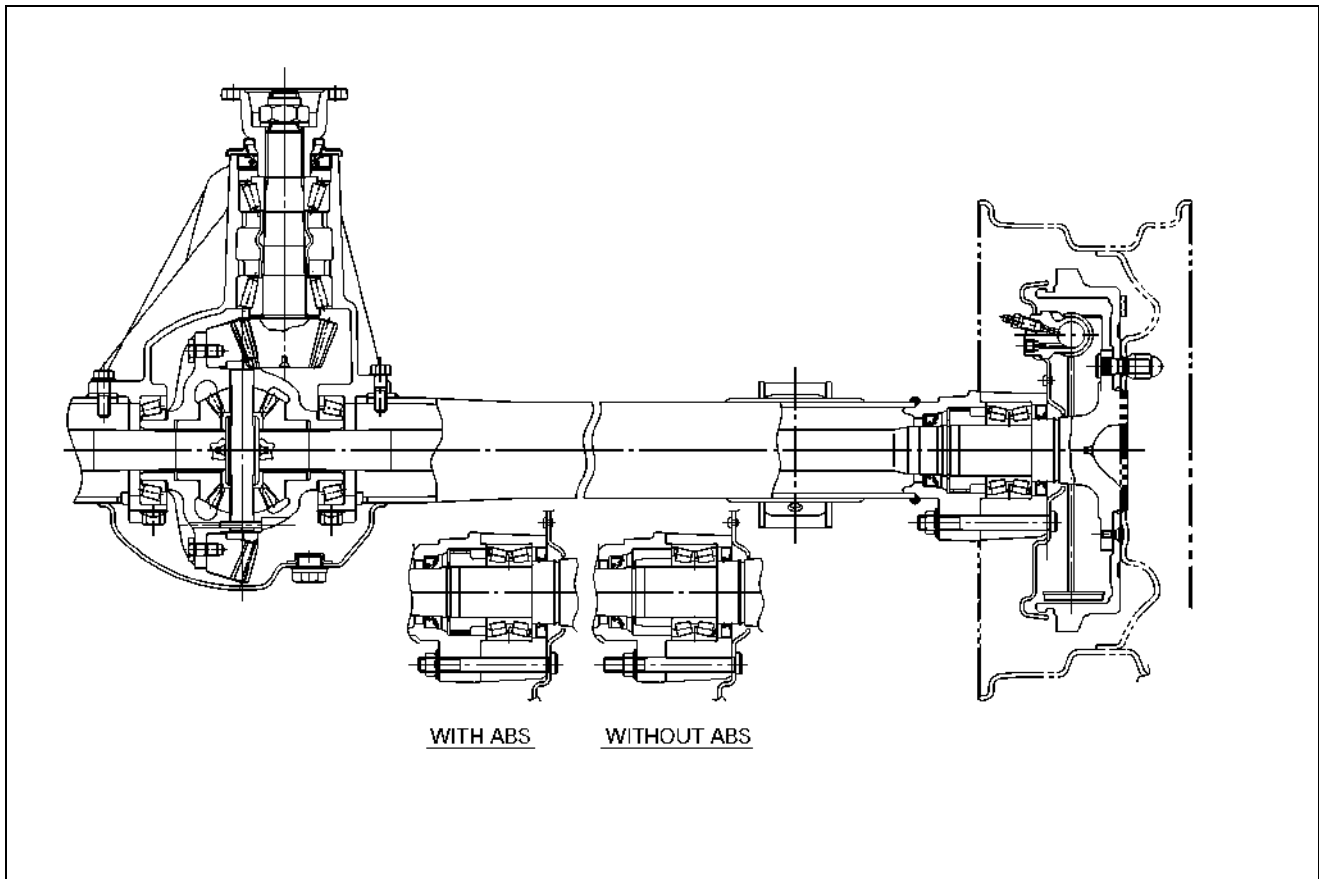
RTW340LF000301

**Legend**

- |   |  |
|---|--|
| 1. Lower link ASM RH  | 6. Lower link ASM LH   |
| 2. Adjust cam RR  | 7. Adjust cam RR   |
| 3. Adjust cam FRT   | 8. Adjust cam FRT  |
| 4. -direction The lower link ASM protrudes toward the inside  | 9. -direction The lower link ASM protrudes toward the inside   |
| 5. +direction The lower link ASM protrudes toward the outside | 10. +direction The lower link ASM protrudes toward the outside |

## REAR AXLE ASSEMBLY

### General Description



A03R300001

The rear axle assembly is of the semi-floating type in which the vehicle weight is carried on the axle housing .

The center line of the pinion gear is below the center line of the ring gear (hypoid drive).

All parts necessary to transmit power from the propeller shaft to the rear wheels are enclosed in a banjo type axle housing.

The 220 mm (8.6 in) ring gear rear axle uses a conventional ring and pinion gear set to transmit the driving force of the engine to the rear wheels. This gear set transfers this driving force at a 90 degree angle from the propeller shaft to the drive shafts.

The axle shafts are supported at the wheel end of the shaft by a double tapered roller bearing.

The pinion gear is supported by two tapered roller bearings. The pinion depth is set by a shim pack located between the gear end of the pinion and the roller bearing that is pressed onto the pinion. The pinion bearing preload is set by crushing a collapsible spacer between the bearings in the axle housing.

The ring gear is bolted onto the differential cage with 12 bolts.

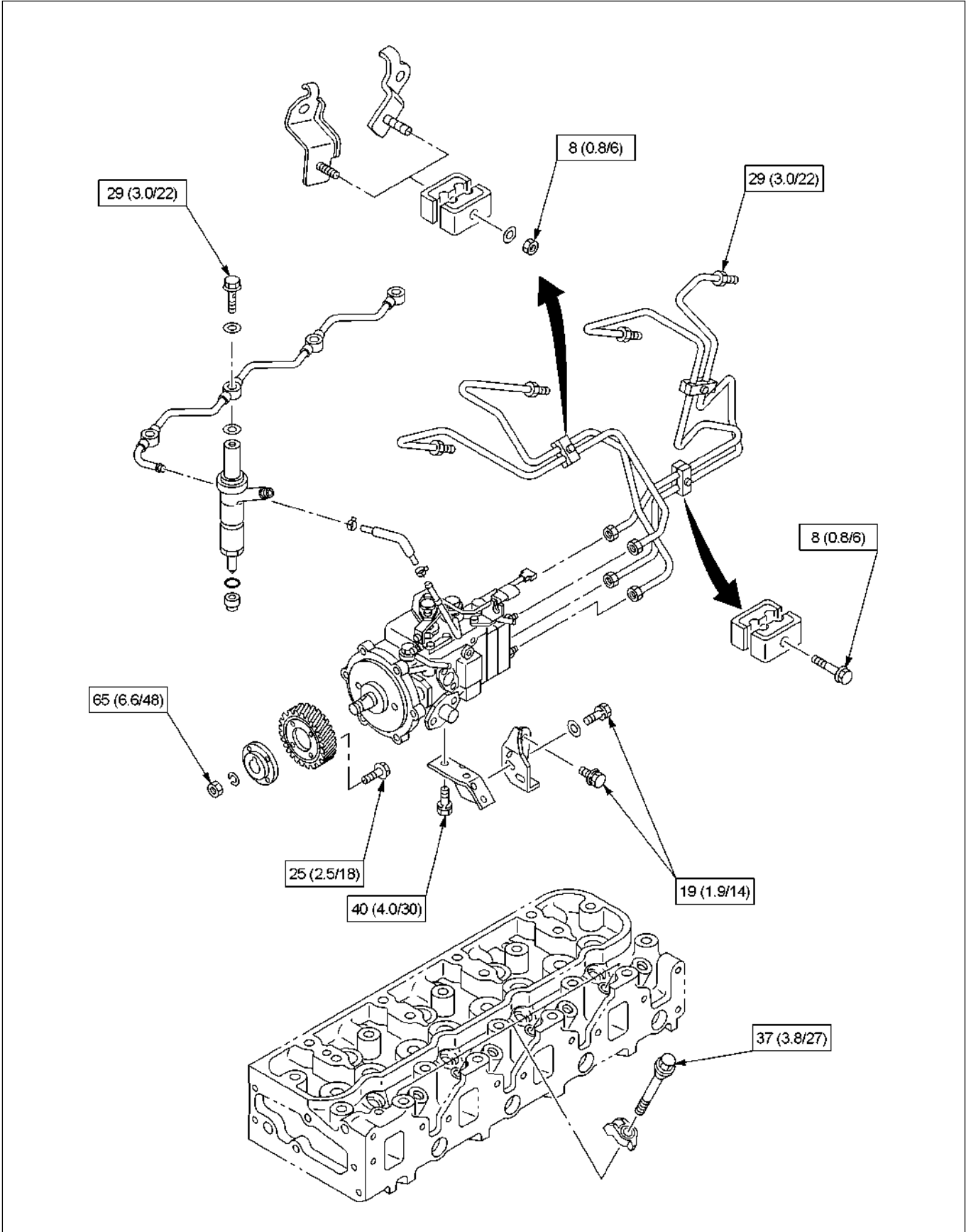
The differential cage is supported in the axle housing by two tapered roller bearings. The differential and ring gear are located in relationship to the pinion by using selective shims and spacers between the bearing and the differential cage. To move the ring gear, shims are deleted from one side and an equal amount are added to the other side. These shims are also used to preload the bearings which are pressed onto the differential cage. Two bearing caps are used to hold the differential into the rear axle housing.

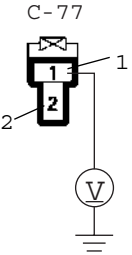
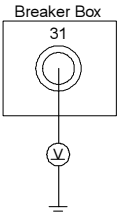
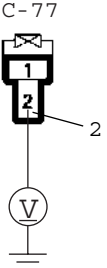
The differential is used to allow the wheels to turn at different rates of speed while the rear axle continues to transmit the driving force. This prevents tire scuffing when going around corners and prevents premature wear on internal axle parts.

The rear axle is sealed with a pinion seal, a seal at each axle shaft end, and by a liquid gasket between the differential carrier and the axle housing

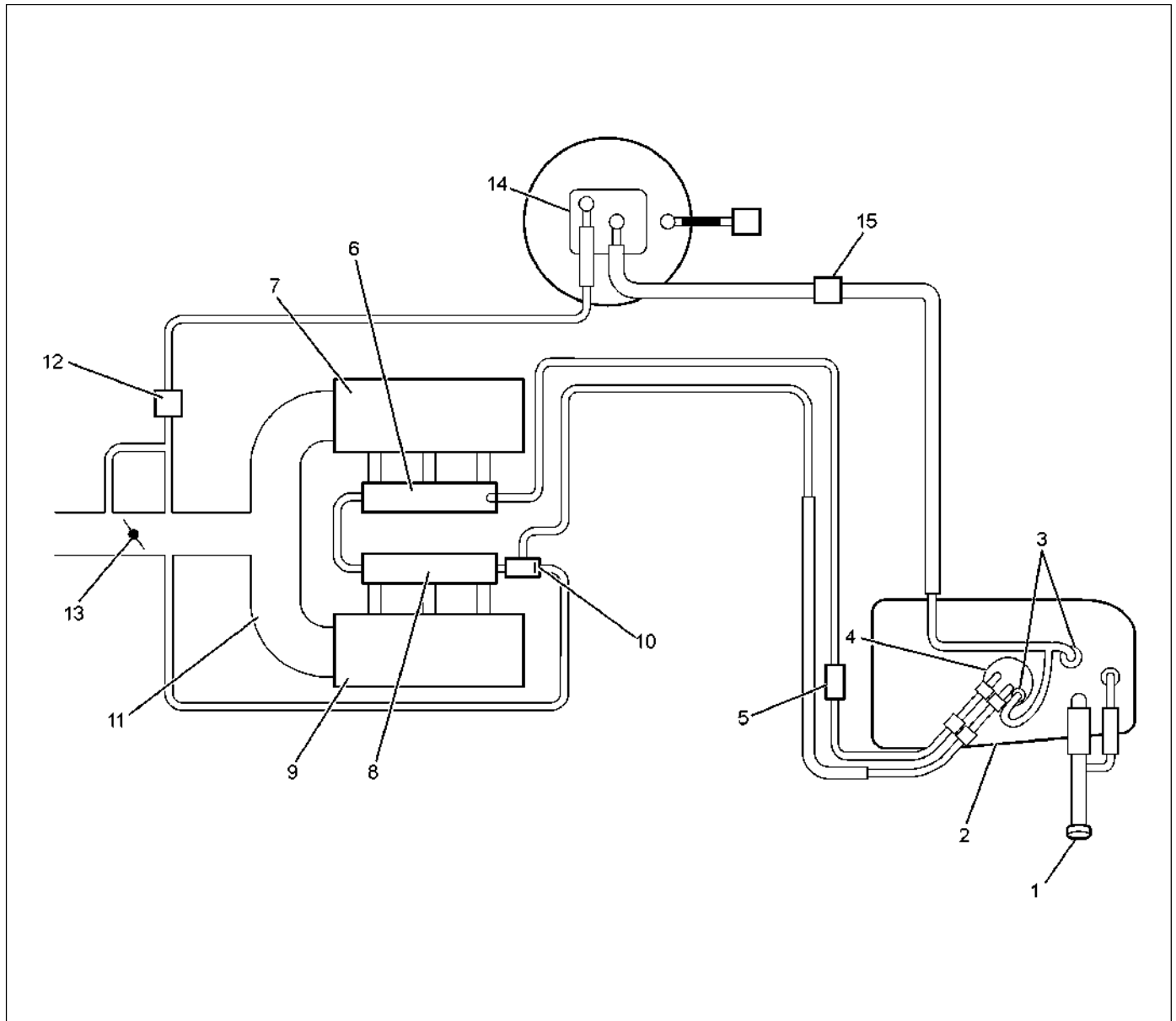
Fuel Injection System (4JA1L)

N·m (kg·m/lb·ft)



Step	Action	Value(s)	Yes	No
6	<p>Using the DVM and check the clutch switch power supply circuit.</p> <ol style="list-style-type: none"> <li>1. Ignition "On", engine "Off".</li> <li>2. Remove the clutch switch connector from the clutch switch.</li> <li>3. Check the circuit for open circuit.</li> </ol> <p>Was the DVM indicated specified value?</p> 	10-14.5V	Go to Step 8	Go to Step 7
7	<p>Repair the open circuit between the "ECM fuse (10A)" and clutch switch.</p> <p>Is the action complete?</p>	—	Verify repair	—
8	<p>Using the DVM and check the clutch switch circuit.</p> <p><b>Breaker box is available:</b></p> <ol style="list-style-type: none"> <li>1. Ignition "Off", engine "Off".</li> <li>2. Install the breaker box as type B. (ECM connected) Ref. Page 6E-104</li> <li>3. Ignition "On", engine "Off".</li> <li>4. Check the circuit for open or short to voltage circuit.</li> </ol> <p>Was the DVM indicated specified value?</p>  <p><b>Breaker box is not available:</b></p> <ol style="list-style-type: none"> <li>1. Ignition "On", engine "Off".</li> <li>2. Back probe the DVM to the clutch switch and check the circuit for open or short to voltage circuit.</li> </ol> <p>Was the problem found?</p> 	<p>Pedal is not stepped on: 10-14.5V                      Pedal stepped on: Less than 1V</p>	Go to Step 11	<p>Fixed at 10-14.5V: Go to Step 9                      Fixed at less than 1V: Go to Step 10</p>

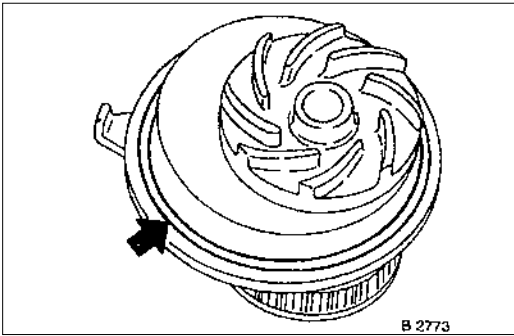
## General Description



RTW36CLF000301

### Legend

- |                                   |                                  |
|-----------------------------------|----------------------------------|
| (1) Fuel Filler Cap               | (8) Fuel Rail Left               |
| (2) Fuel Tank                     | (9) Intake Air Port Left Bank    |
| (3) Rollover Valve                | (10) Fuel Pressure Control Valve |
| (4) Fuel Pump and Sender Assembly | (11) Common Chamber              |
| (5) Fuel Filter                   | (12) Duty Solenoid Valve         |
| (6) Fuel Rail Right               | (13) Throttle Valve              |
| (7) Intake Air Port Right Bank    | (14) Canister                    |
|                                   | (15) Evapo Control Valve         |

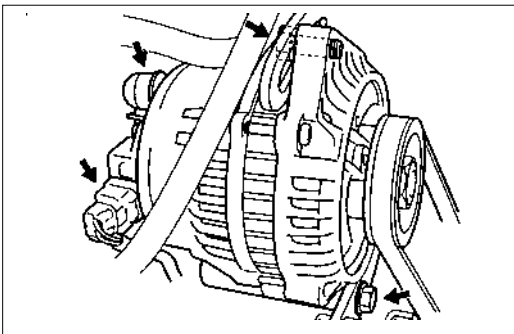


### Coating sealing surfaces with Silicone Grease



#### Installation

1. Install water pump to cylinder block with new rubber O-ring.
2. Apply tension to toothed belt according to the corresponding operation.
3. Install coolant hoses.
4. Fill cooling system and bleed according to the corresponding operation.



### Alternator

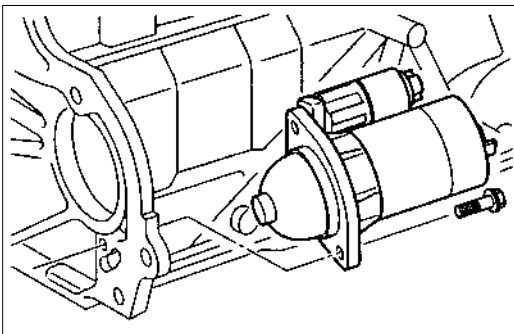
#### Removal

1. Remove ground cable from battery.
2. Remove cable connection from alternator and V-belt.
3. Remove alternator from retaining strap and lower fastening.



#### Installation

1. Install alternator by tightening firmly by hand.
2. Install V-belt and apply tension according to the corresponding operation.
3. Install cable connections to alternator.
4. Install ground cable to battery.



### Starter

#### Removal

1. Remove cable connections from starter.
2. Remove upper bolt of transmission side.
3. Remove lower bolt of engine side.



### Tighten (Torque)

Starter to cylinder block:

Engine side - 51 N·m (5.2 kgf·m)

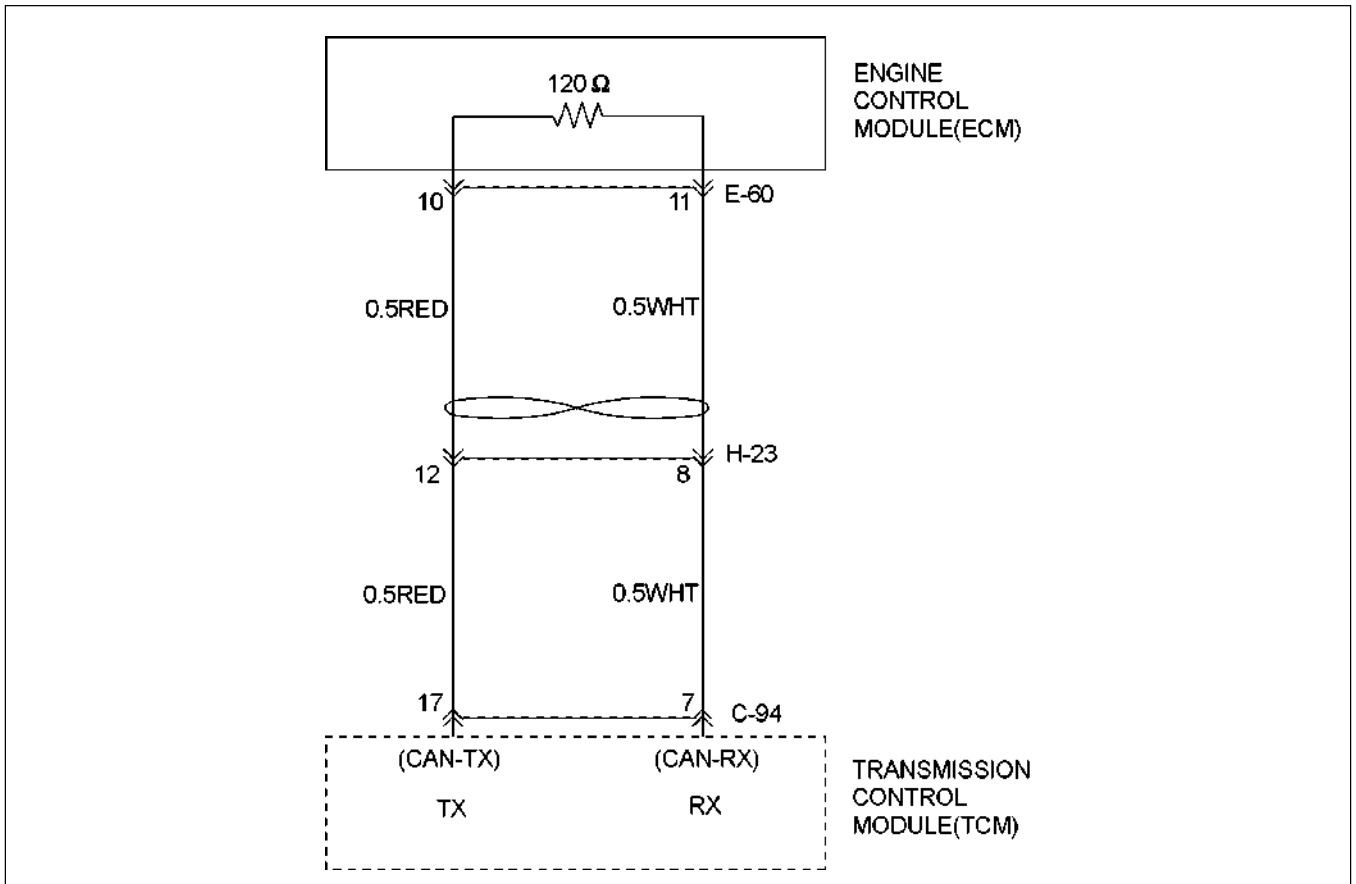
Transmission side - 75 N·m (7.6 kgf·m)

Starter support to cylinder block - 25 N·m (2.5 kgf·m)

Re-connect cables.



## DTC U2104 (FLASHING CODE 65) CAN BUSS OFF



RTW37AMF000401

### Circuit Description

The automatic transmission control system in AW30-40LE uses high speed CAN bus system. The individual CAN bus systems are connected via two interfaces and can exchange information and data. This allows control modules that are connected to different CAN bus systems to communicate. Transmission control modules in the vehicle that require continuous, rapid communication are connected to the high speed CAN bus. The automatic transmission is continuously notified of the current engine load status. Since the automatic transmission control module has to react immediately to load status changes, rapid communication is required between the engine control module and the automatic transmission control module. The high speed CAN bus in the AW30-40LE is designed as a two-wire CAN bus (twisted pair). The wires are shielded and twisted. The transmission rate is 500K band.

### Condition for setting the DTC

The TCM detects CAN BUS OFF for 0.18 sec (After the TCM leaves a communication start with the ECM for 0.64 sec) continuously..

### Action Taken When The DTC Sets

- The throttle pressure is max.
- The TCM judges APS(Accelerator Position Sensor) angle is 0% at the time of shift operation.
- No throttle pressure reduction.
- No torque reduction.
- No lock-up control.
- No slope control.
- No squat control.
- Check Trans ON.
- DTC stored.
- Engine REV is 7000 rpm.
- Coolant temperature is 80°C.

**Gear Position & Shift Solenoid Operation**

Range	TCM terminal				
	Gear	B8 (High clutch solenoid)	B9 (Low clutch solenoid)	B7 (2-4 brake solenoid)	B6 (Low & reverse brake solenoid)
P	—	○	×	○	○
R	Reverse	○	×	○	×
N	—	○	×	○	○
D, 3, 2	1st	○	×	○	○
	2nd	○	×	×	○
	3rd	×	×	○	○
	4th	×	○	×	○
L	1st	○	×	○	×
	2nd	○	×	×	○
	3rd	×	×	○	○
	4th	×	○	×	○

○ : On (Operated)

× : Off (Not operated)

**Setting Condition:**

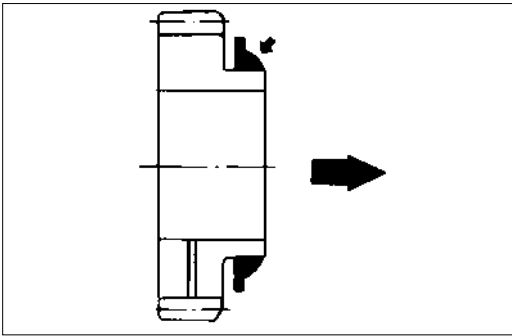
- The low & reverse brake duty solenoid signal is open circuit or short circuit.  
(The voltage different from the output ON/OFF signals was detected while the TCM monitors the solenoid output voltage.)

**Fail Safe:**

- When the vehicle is running, the operation of the low & reverse brake duty solenoid and the lock-up solenoid is stopped (OFF), the gear position selected at the trouble detection is held, and the lock-up is inhibited.
- After the vehicle stopped, all solenoid operations stop (OFF) and the gear is fixed to the 3rd.

**Possible Cause:**

- Low & reverse brake duty solenoid malfunction.
- Open (Off) circuit or short (On) circuit harness of the low & reverse brake duty solenoid.
- Open circuit, short circuit to battery or short circuit to ground between low & reverse brake duty solenoid terminal 5 and TCM terminal B6 (C96).
- Insufficient ground condition of the low & reverse brake duty solenoid.
- Poor connection of each connector.



## Important Operations

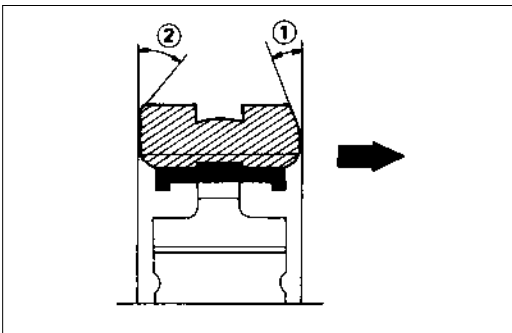


### 2. Needle Bearing



### 3. 2nd Gear

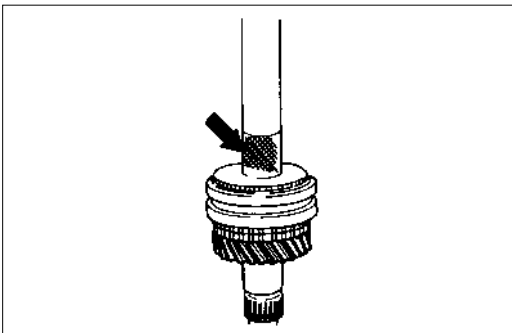
- 1) Apply the engine oil to the 2nd needle bearing and the 2nd gear.
- 2) Install the needle bearing and the 2nd gear to the mainshaft.  
The dog teeth of the 2nd gear must be facing the rear side of the transmission.



### 5. 1st-2nd Synchronizer Assembly

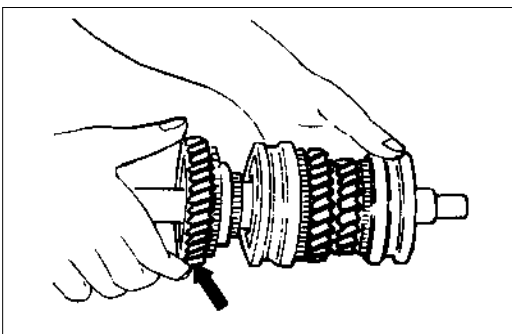


- 1) Apply the engine oil to the clutch hub spline.
- 2) Install the synchronizer assembly to the mainshaft.  
The outside sleeve heavy chamfering must be facing the rear of the transmission.
  - ① Chamfer Angle = 30°
  - ② Chamfer Angle = 45°



### 7. Needle Bearing Collar

Use a bench press and the collar installer to install the needle bearing collar.  
Collar Installer : 5-8840-0178-0 (J-33851)

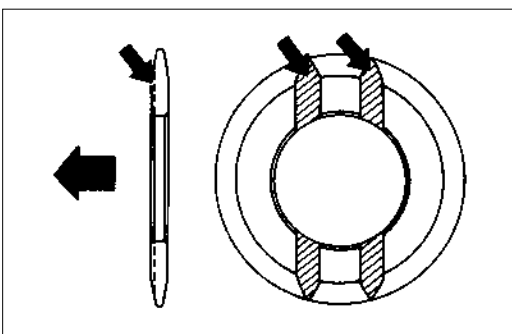


### 8. Needle Bearing



### 9. 1st Gear

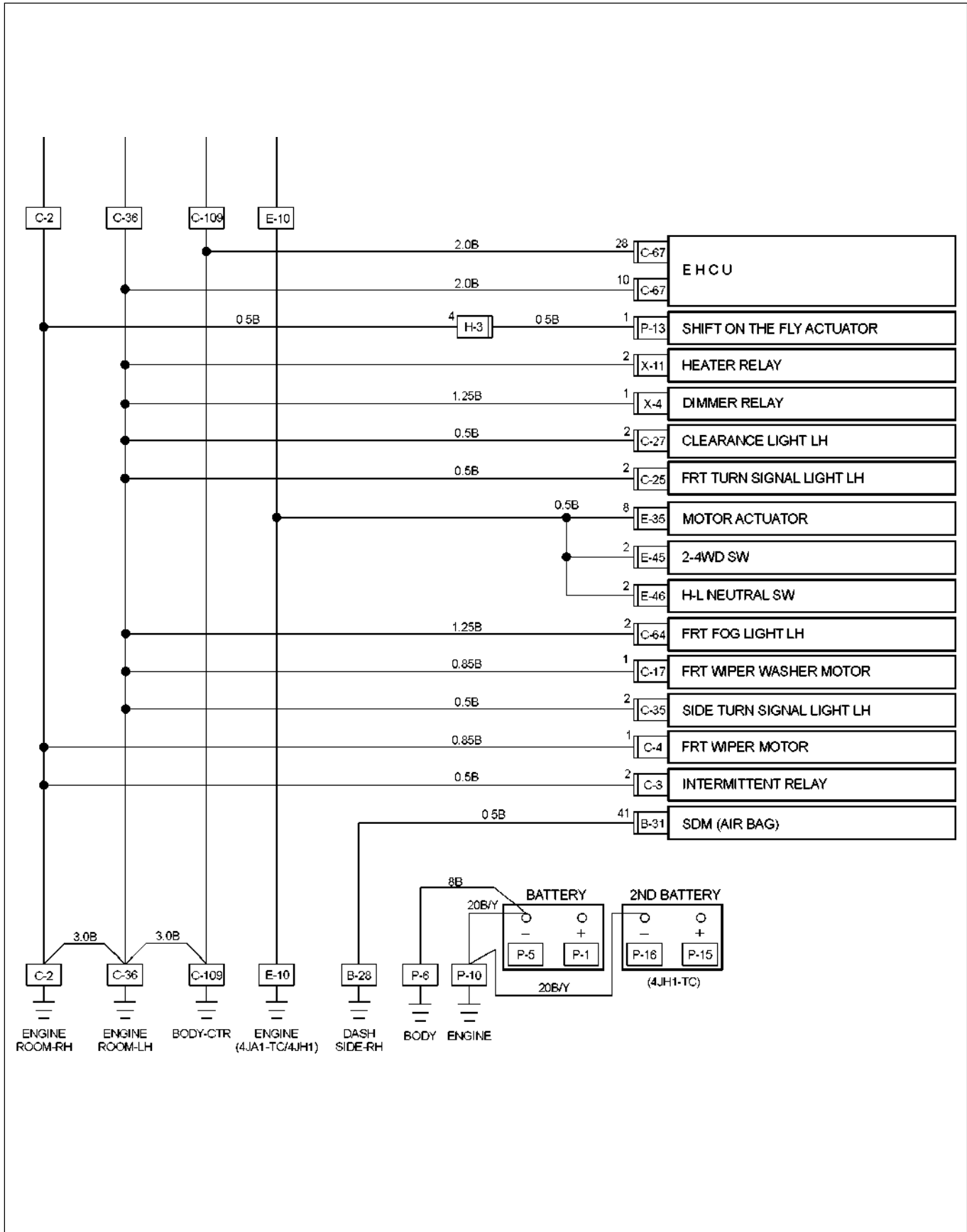
- 1) Apply the engine oil to the 1st needle bearing and the 1st gear.
- 2) Install the needle bearing and the gear to the mainshaft.  
The dog teeth of the 1st gear must be facing the front side of the transmission.



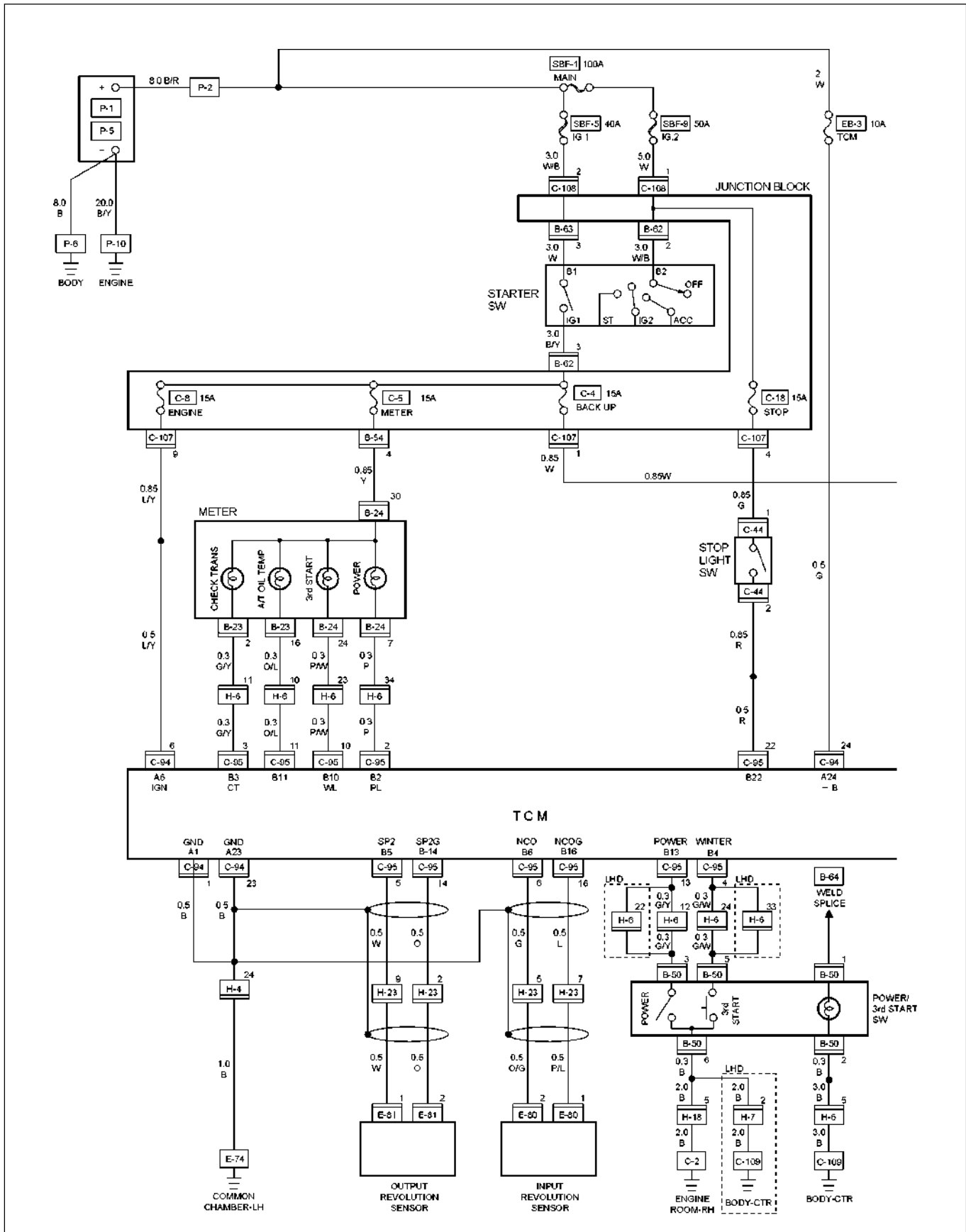
### 10.1st Gear Thrust Washer

Install the thrust washer to the mainshaft.  
The thrust washer oil groove must be facing the 1st gear side.

GROUND POINT (LHD) EUROPE



CIRCUIT DIAGRAM 6VE1



## TROUBLE SHOOTING

### Rear defogger inoperative

Checkpoint	Trouble Cause	Countermeasure
Fuse No. C-7 (15A, Fuse box) and 9 <span style="border: 1px solid black; padding: 0 2px;">B-56</span>	NG Poor fuse contact or blown	Reinstall or replace the fuse No. C-7 (15A) and 9 <span style="border: 1px solid black; padding: 0 2px;">B-56</span>
OK		
SBF-10 (20A, Fuse box)	NG Poor fuse contact or blown	Reinstall or replace the fuse SBF-10 (20A)
OK		
Rear defogger switch function	NG Switch malfunction	Replace the rear defogger switch
OK		
Rear defogger relay function	NG Relay malfunction	Replace the rear defogger relay
OK		
Grounding point <span style="border: 1px solid black; padding: 0 2px;">C-2</span>	NG Poor grounding point contact	Repair grounding point <span style="border: 1px solid black; padding: 0 2px;">D-2</span> contact
OK		
Voltage between 1 <span style="border: 1px solid black; padding: 0 2px;">L-4</span> - ground when the starter switch and the rear defogger switch are at on position (should be battery voltage present)	NG Open circuit or poor connector contact	Repair open circuit or poor connector contact between fuse No. C-7 (15A) and 3 <span style="border: 1px solid black; padding: 0 2px;">B-7</span> , SBF-10 (20A) and 1 <span style="border: 1px solid black; padding: 0 2px;">B-7</span> , 2 <span style="border: 1px solid black; padding: 0 2px;">B-7</span> (3 <span style="border: 1px solid black; padding: 0 2px;">B-55</span> ) and 1 <span style="border: 1px solid black; padding: 0 2px;">L-4</span> , 4 <span style="border: 1px solid black; padding: 0 2px;">B-7</span> (3 <span style="border: 1px solid black; padding: 0 2px;">B-54</span> ) and 3 <span style="border: 1px solid black; padding: 0 2px;">B-46</span> or 1 <span style="border: 1px solid black; padding: 0 2px;">B-46</span> and <span style="border: 1px solid black; padding: 0 2px;">C-2</span>

Continued on the next page

## 9A1-40 RESTRAINT CONTROL SYSTEM

### DTC Chart Test Description

Number(s) below refer to step number(s) on the diagnostic chart:

2. If air bag assembly have not deployed, DTC B0053 may have falsely set.
3. If DTC B0053 has set with no signs of frontal impact, the diagnostic trouble code has falsely set.

### DTC B0053 (Flash Code 53) Deployment Command Despite Present Trouble Code

**WARNING: DURING SERVICE PROCEDURES. BE VERY CAREFUL WHEN HANDLING A SRS CONTROL UNIT. NEVER STRIKE OR JAR THE SRS CONTROL UNIT. NEVER POWER UP THE SRS WHEN THE SRS CONTROL UNIT IS NOT RIGIDLY ATTACHED TO THE VEHICLE. ALL SRS CONTROL UNIT AND MOUNTING BRACKET FASTENERS MUST BE CAREFULLY TORQUED AND THE ARROW MUST BE POINTING TOWARD THE FRONT OF THE VEHICLE TO ENSURE PROPER OPERATION OF THE SRS. THE SRS CONTROL UNIT COULD BE ACTIVATED WHEN POWERED WHILE NOT RIGIDLY ATTACHED TO THE VEHICLE WHICH COULD CAUSE DEPLOYMENT AND RESULT IN PERSONAL INJURY.**

Step	Action	Yes	No
1	Was the "SRS Diagnostic System Check" performed?	Go to Step 2	Go to the "SRS Diagnostic System Check"
2	Ignition switch "OFF." Have air bag assemblies deployed?	Replace components and perform inspections as directed in "Repairs And Inspections Required After An Accident" in this section. Clear diagnostic trouble codes. Repeat the "SRS Diagnostic System Check"	Go to Step 3
3	Inspect front of vehicle and undercarriage for signs of impact. Were signs of impact found?	Replace components and perform inspections as directed in "Repairs And Inspections Required After An Accident" in this section. Clear diagnostic trouble codes. Repeat "SRS Diagnostic System Check"	Ignition switch "OFF." Replace SRS control unit. Reconnect all SRS system components, ensure all components are properly mounted. Repeat the "SRS Diagnostic System Check"