

ENGINE

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SPECIFICATIONS

GENERAL SPECIFICATIONS

<Vehicles for Europe>

Items	4G13 Computer	4G13 - MPI**	4G15 - Computer	4G15 - MPI
Total displacement (cc/cu in.)	1,295 (78.9)	1,295 (78.9)	1,408 (85.9)	1,408 (85.9)
Bore x Stroke, mm/in.	71.0 x 82.0 (2.795 x 3.228)	71.0 x 82.0 (2.795 x 3.228)	75.5 x 82.0 (2.972 x 3.228)	75.5 x 82.0 (2.972 x 3.228)
Compression ratio	9.7:1, 8.5:1	9.5	9.4:1, 8.2:1	9.4:1, 8.2:1
Firing order	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2
Injection system	—	—	—	—
Combustion chamber	Compact type** Pentroof type**	Pentroof type	Compact type** Pentroof type**	Compact type** Pentroof type**
Valve mechanism	OHV	OHV	OHV	OHV
Camshaft arrangement	SOHC	SOHC	SOHC	SOHC
Camshaft drive	Copied belt	Copied belt	Copied belt	Copied belt
Valve timing	Open: BTDC 18° 15°	Open: BTDC 21°	Open: BTDC 18° 15°	Open: BTDC 18° 15°
Intake	Close: ABDC 67° 63°	Close: ABDC 47°	Close: ABDC 67° 63°	Close: ABDC 67° 63°
Exhaust	Open: BBDC 87° 83°	Open: BBDC 63°	Open: BBDC 87° 83°	Open: BBDC 87° 83°
Valve	Close: ATDC 18° 15°	Close: ATDC 9°	Close: ATDC 18° 15°	Close: ATDC 18° 15°
Shock absorber	Slipper type** Roller follower type**	Roller follower type	Slipper type** Roller follower type**	Slipper type** Roller follower type**
Steering	—	—	—	—
Brake	W106P-11 W106P-11** W106P-11** W106P-11** W106P-11**	W106P-11	W106P-11	W106P-11

NOTE

**1-BC

*Vehicles built up to May 1980

*Vehicles built from June 1980

*Vehicles built from June 1981

SPECIFICATIONS

GENERAL SPECIFICATIONS

<Vehicles for Europe>

Items	4G13 Carburettor	4G13 – MPI* ⁴	4G15 – Carburettor	4G15 – MPI
Total displacement cc (cu.in.)	1,299 (79.3)	1,299 (79.3)	1,468 (89.6)	1,468 (89.6)
Bore x Stroke mm (in.)	71.0 x 82.0 (2.795 x 3.228)	71.0 x 82.0 (2.795 x 3.228)	75.5 x 82.0 (2.972 x 3.228)	75.5 x 82.0 (2.972 x 3.228)
Compression ratio	9.7* ² , 9.5* ³	9.5	9.4* ² , 9.2* ³	9.4* ² , 9.2* ³
Firing order	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2
Injection order	–	–	–	–
Combustion chamber	Compact type* ² , Pentroof type* ³	Pentroof type	Compact type* ² , Pentroof type* ³	Compact type* ² , Pentroof type* ³
Valve mechanism	OHV	OHV	OHV	OHV
Camshaft arrangement	SOHC	SOHC	SOHC	SOHC
Camshaft drive by	Cogged belt	Cogged belt	Cogged belt	Cogged belt
Valve timing				
Intake	Open: BTDC 19°* ² , 15°* ³ Close: ABDC 57°* ² , 53°* ³	Open: BTDC 21° Close: ABDC 47°	Open: BTDC 19°* ² , 15°* ³ Close: ABDC 57°* ² , 53°* ³	Open: BTDC 19°* ² , 17°* ³ Close: ABDC 57°* ² , 55°* ³
Exhaust	Open: BBDC 57° Close: ATDC 19°* ² , 15°* ³	Open: BBDC 63° Close: ATDC 9°	Open: BBDC 57° Close: ATDC 19°* ² , 15°* ³	Open: BBDC 57°* ² , 59°* ³ Close: ATDC 19°* ² , 17°* ³
Rocker arm	Slipper type* ² , Roller follower type* ³	Roller follower type	Slipper type* ² , Roller follower type* ³	Slipper type* ² , Roller follower type* ³
Lash adjuster	–	–	–	–
Spark plug				
NGK	BPR5ES, BPR6ES-11* ¹ , BUR6EA-11* ¹	BPR5ES-11	BPR5ES	BPR5ES-11
NIPPON DENSO	W16EPR-11, W20EPR11* ¹ , W20EPR-S11* ¹	W16EPR-11	W16EPR-11	W16EPR-11

NOTE

*¹: <FBC>*²: Vehicles built up to May 1990*³: Vehicles built from June 1990*⁴: Vehicles built from June 1992

Items	4G16	4G27	4G37
Total displacement cc (cu.in.)	1,198 (73.1)	1,755 (107.1)	1,755 (107.1)
Bore x Stroke mm (in.)	68.2 x 82.0 (2.685 x 3.228)	80.5 x 86.0 (3.173 x 3.386)	80.5 x 86.0 (3.173 x 3.386)
Compression ratio	9.5	9.5	9.5
Firing order	1-3-4-2	1-3-4-2	1-3-4-2
Injection order	—	—	—
Combustion chamber	Compact type	Compact type	Compact type
Valve mechanism	OHV	OHV	OHV
Camshaft arrangement	SOHC	SOHC	SOHC
Camshaft drive by	Cogged belt	Cogged belt	Cogged belt
Valve timing			
Intake	Open: BTDC 19° Close: ABDC 57°	Open: BTDC 21° Close: ABDC 67°	Open: BTDC 21° Close: ABDC 67°
Exhaust	Open: BBDC 57° Close: ATDC 19°	Open: BBDC 64° Close: ATDC 21°	Open: BBDC 64° Close: ATDC 21°
Rocker arm	Slipper type	Slipper type	Slipper type
Lash adjuster	—	—	—
Spark plug			
NGK	BPR6ES	BPR6E11	BPR6E11
NIPPON DENSO	W20EPR	W20EPR11	W20EPR11

Items	4G16	4G27	4G37
Total displacement cc (cu.in.)	1,198 (73.1)	1,755 (107.1)	1,755 (107.1)
Bore x Stroke mm (in.)	68.2 x 82.0 (2.685 x 3.228)	80.5 x 86.0 (3.173 x 3.386)	80.5 x 86.0 (3.173 x 3.386)
Compression ratio	9.5	9.5	9.5
Firing order	1-3-4-2	1-3-4-2	1-3-4-2
Injection order	—	—	—
Combustion chamber	Compact type	Compact type	Compact type
Valve mechanism	OHV	OHV	OHV
Camshaft arrangement	SOHC	SOHC	SOHC
Camshaft drive by	Cogged belt	Cogged belt	Cogged belt
Valve timing			
Intake	Open: BTDC 19° Close: ABDC 57°	Open: BTDC 21° Close: ABDC 67°	Open: BTDC 21° Close: ABDC 67°
Exhaust	Open: BBDC 57° Close: ATDC 19°	Open: BBDC 64° Close: ATDC 21°	Open: BBDC 64° Close: ATDC 21°
Rocker arm	Slipper type	Slipper type	Slipper type
Lash adjuster	—	—	—
Spark plug			
NGK	BPR6ES	BPR6E11	BPR6E11
NIPPON DENSO	W20EPR	W20EPR11	W20EPR11

NOTE

* Varies from May 1989
 * Varies from Dec 1989
 * Varies from June 1992

Items	4G37* ¹	4G61	4G67* ²	4D65
Total displacement cc (cu.in.)	1,755 (107.1)	1,596 (97.4)	1,836 (112.0)	1,796 (109.6)
Bore x Stroke mm (in.)	80.6 x 86.0 (3.173 x 3.386)	82.3 x 75.0 (3.240 x 2.953)	81.5 x 88.0 (3.209 x 3.465)	80.6 x 88.0 (3.173 x 3.465)
Compression ratio	9.5	9.4	10.5	22.2
Firing order	1-3-4-2	1-3-4-2	1-3-4-2	—
Injection order	—	—	—	1-3-4-2
Combustion chamber	Compact type	Pentroof type	Pentroof type	Swirl chamber
Valve mechanism	OHV	OHV	OHV	OHV
Camshaft arrangement	SOHC	DOHC	DOHC	SOHC
Camshaft drive by	Cogged belt	Cogged belt	Cogged belt	Cogged belt
Valve timing				
Intake	Open: BTDC 21° Close: ABDC 67°	Open: BTDC 21° Close: ABDC 51°	Open: BTDC 18° Close: ABDC 62°	Open: BTDC 20° Close: ABDC 48°
Exhaust	Open: BBDC 64° Close: ATDC 24°	Open: BBDC 54° Close: ATDC 17°	Open: BBDC 63° Close: ATDC 21°	Open: BBDC 54° Close: ATDC 22°
Rocker arm	Slipper type	Roller follower type	Roller follower type	Roller follower type
Lash adjuster	—	Hydraulic type	Hydraulic type	—
Spark plug				
NGK	BPR6ES-11	BPR6ES	BPR6ES	—
NIPPON DENSO	W20EPR11	W20EPR	W20EPR	—

Items	4G92* ³	4G93* ³	4D68* ³
Total displacement cc (cu.in.)	1,597 (97.4)	1,834 (111.9)	1,998 (121.9)
Bore x Stroke mm (in.)	81.0 x 77.5 (3.19 x 3.05)	81.0 x 89.0 (3.19 x 3.50)	82.7 x 93.0 (3.26 x 3.66)
Compression ratio	10.0	10.5	22.4
Firing order	1-3-4-2	1-3-4-2	—
Injection order	—	—	1-3-4-2
Combustion chamber	Pentroof type	Pentroof type	Swirl chamber
Valve mechanism	OHV	OHV	OHV
Camshaft arrangement	SOHC	DOHC	SOHC
Camshaft drive by	Cogged belt	Cogged belt	Cogged belt
Valve timing			
Intake	Open: BTDC 14° Close: ABDC 58°	Open: BTDC 20° Close: ABDC 60°	Open: BTDC 20° Close: ABDC 48°
Exhaust	Open: BBDC 52° Close: ATDC 16°	Open: BBDC 60° Close: ATDC 16°	Open: BBDC 54° Close: ATDC 22°
Rocker arm	Roller follower type	Roller follower type	Roller follower type
Lash adjuster	—	Hydraulic type	—
Spark plug			
NGK	BK5E-11	BK5E-11	—
NIPPON DENSO	K16P-U11	K16P-U11	—

NOTE

*¹: Vehicles built from May 1989*²: Vehicles built from Dec. 1989*³: Vehicles built from June 1992

<Vehicles for General Export>

Items	4G13	4G15 – Carburettor	4G15 – MPI
Total displacement cc (cu.in.)	1,299 (79.3)	1,468 (89.6)	1,198 (73.1)
Bore x Stroke mm (in.)	71.0 x 82.0 (2.795 x 3.228)	75.5 x 82.0 (2.972 x 3.228)	68.2 x 82.0 (2.685 x 3.228)
Compression ratio	9.7 ^{*2} , 9.5 ^{*3}	9.4 ^{*2} , 9.2 ^{*3}	9.5 ^{*2} , 9.2 ^{*3}
Firing order	1-3-4-2	1-3-4-2	1-3-4-2
Injection order	–	–	–
Combustion chamber	Compact type ^{*2} , Pentroof type ^{*3}	Compact type ^{*2} , Pentroof type ^{*3}	Compact type ^{*2} , Pentroof type ^{*2}
Valve mechanism	OHV	OHV	OHV
Camshaft arrangement	SOHC	SOHC	SOHC
Camshaft drive by	Cogged belt	Cogged belt	Cogged belt
Valve timing			
Intake	Open: BTDC 19° ^{*2} , 15° ^{*3} Close: ABDC 57° ^{*2} , 53° ^{*3}	Open: BTDC 19° ^{*2} , 15° ^{*3} Close: ABDC 57° ^{*2} , 53° ^{*3}	Open: BTDC 19° ^{*2} , 17° ^{*3} Close: ABDC 57° ^{*2} , 55° ^{*3}
Exhaust	Open: BBDC 57° ^{*2} , 57° ^{*3} Close: ATDC 19° ^{*2} , 15° ^{*3}	Open: BBDC 57° ^{*2} , 57° ^{*3} Close: ATDC 19° ^{*2} , 15° ^{*3}	Open: BBDC 57° ^{*2} , 59° ^{*3} Close: ATDC 19° ^{*2} , 17° ^{*3}
Rocker arm	Slipper type ^{*2} , Roller follower type ^{*3}	Slipper type ^{*2} , Roller follower type ^{*3}	Slipper type ^{*2} , Roller follower type ^{*3}
Lash adjuster	–	–	–
Spark plug			
NGK	BP5ES, BPR5ES ^{*1}	BP5ES, BPR5ES ^{*1}	BP5ES
NIPPON DENSO	W16EP, W16EPR ^{*1}	W16EP, W16EPR ^{*1}	W16EP

NOTE

*¹: <Vehicles for Hong Kong and Singapore> *²: Vehicles built from June 1990*³: Vehicles built up to May 1990

Items	4G92 ^{*1}	4G61	4G67 [*]
Total displacement cc (cu.in.)	1,597 (97.4)	1,597 (97.4)	1,836 (112.0)
Bore x Stroke mm (in.)	81.0 x 77.5 (3.19 x 3.05)	82.3 x 75.0 (3.240 x 2.953)	81.5 x 88.0 (3.209 x 3.465)
Compression ratio	10.0	9.4	10.5
Firing order	1-3-4-2	1-3-4-2	1-3-4-2
Injection order	–	–	–
Combustion chamber	Pentroof type	Pentroof type	Pentroof type
Valve mechanism	OHV	OHV	OHV
Camshaft arrangement	SOHC	DOHC	DOHC
Camshaft drive by	Cogged belt	Cogged belt	Cogged belt
Valve timing			
Intake	Open: BTDC 14° Close: ABDC 58°	Open: BTDC 21° Close: ABDC 51°	Open: BTDC 18° Close: ABDC 62°
Exhaust	Open: BBDC 52° Close: ATDC 16°	Open: BBDC 54° Close: ATDC 17°	Open: BBDC 63° Close: ATDC 21°
Rocker arm	Roller follower type	Roller follower type	Roller follower type
Lash adjuster	–	Hydraulic type	Hydraulic type
Spark plug			
NGK	BK5E-11	BP7ES	BP7ES
NIPPON DENSO	K16P-U11	W22EP	W22EP

NOTE: *: Vehicles built from June 1990 *¹: Vehicles built from June 1992

Items	4D65
Total displacement cc (cu.in.)	1,796 (109.6)
Bore x Stroke mm (in.)	80.6 x 88.0 (3.173 x 3.465)
Compression ratio	22.2
Firing order	—
Injection order	1-3-4-2
Combustion chamber	Swirl chamber
Valve mechanism	OHV
Camshaft arrangement	SOHC
Camshaft drive by	Cogged belt
Valve timing	
Intake	Open: BTDC 20° Close: ABDC 48°
Exhaust	Open: BBDC 54° Close: ATDC 22°
Rocker arm	Roller follower type
Lash adjuster	Hydraulic type
Spark plug	
NGK	—
NIPPON DENSO	—

<Vehicles for Australia>

Items	4G15 – Carburettor	4G15 – MPI* ¹	4G61 * ²
Total displacement cc (cu.in.)	1,468 (89.6)	1,468 (89.6)	1,596 (97.6)
Bore x Stroke mm (in.)	75.5 x 82.0 (2.972 x 3.228)	75.5 x 82.0 (2.972 x 3.228)	82.3 x 75.0 (3.240 x 2.953)
Compression ratio	9.4* ² , 9.2* ³	9.4* ² , 9.2* ³	9.2
Firing order	1-3-4-2	1-3-4-2	1-3-4-2
Combustion chamber	Compact type* ² , Pentroof type* ³	Compact type* ² , Pentroof type* ³	Pentroof type
Valve mechanism	OHV	OHV	OHV
Camshaft arrangement	SOHC	SOHC	DOHC
Camshaft drive by	Cogged belt	Cogged belt	Cogged belt
Valve timing			
Intake	Open: BTDC 19°* ² , 15°* ³ Close: ABDC 57°* ² , 53°* ³	Open: BTDC 18°* ² , 14°* ³ Close: ABDC 51°	Open: BTDC 16° Close: ABDC 48°
Exhaust	Open: BBDC 57° Close: ATDC 19°* ² , 15°* ³	Open: BBDC 51° Close: ATDC 18°* ² , 14°* ³	Open: BBDC 43° Close: ATDC 17°
Rocker arm	Slipper type* ² , Roller type* ³	Roller type	Roller type
Lash adjuster	—	—	Hydraulic type
Spark plug			
NGK	BP5ES	BP5ES-11	BP6ES-11
NIPPON DENSO	W16EP	W16EP-11	W20EP11

NOTE

*¹: Vehicles built from May 1989*²: Vehicles built up to May 1990*³: Vehicles built from June 1990

Items	4G92*
Total displacement cc (cu.in.)	1,597 (97.4)
Bore x Stroke mm (in.)	81.0 x 77.5 (3.19 x 3.05)
Compression ratio	10.0
Firing order	1-3-4-2
Combustion chamber	Pentroof type
Valve mechanism	OHV
Camshaft arrangement	SOHC
Camshaft drive by	Cogged belt
Valve timing	
Intake	Open: BTDC 14° Close: ABDC 58°
Exhaust	Open: BBDC 52° Close: ATDC 16°
Rocker arm	Roller follower type
Lash adjuster	—
Spark plug	
NGK	BKR6E-11
NIPPON DENSO	K20PR-U11

NOTE:

*: Vehicles built from June 1992

SERVICE SPECIFICATIONS

E11CB..

<Vehicles for Europe>

Items	4G13	4G15	4G16
Standard value			
Opening pressure of radiator cap kPa (kg/cm ² , psi)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)
Drive belt deflection mm (in.)			
Alternator			
When checked	7.0 – 9.0 (0.28 – 0.35)	7.0 – 9.0 (0.28 – 0.35)	7.0 – 9.0 (0.28 – 0.35)
When a new belt is installed	5.5 – 7.0 (0.22 – 0.28)	5.5 – 7.0 (0.22 – 0.28)	5.5 – 7.0 (0.22 – 0.28)
When a used belt is installed	8.0 (0.31)	8.0 (0.31)	8.0 (0.31)
Power steering oil pump	6.0 – 9.0 (0.24 – 0.35), 5.5 – 7.5 (0.22 – 0.30)* ¹	6.0 – 9.0 (0.24 – 0.35)	6.0 – 9.0 (0.24 – 0.35)
Air conditioner compressor			
When checked	6.0 – 7.0 (0.24 – 0.28)	6.0 – 7.0 (0.24 – 0.28)	6.0 – 7.0 (0.24 – 0.28)
When a new belt is installed	5.0 – 6.0 (0.20 – 0.24)	5.0 – 6.0 (0.20 – 0.24)	5.0 – 6.0 (0.20 – 0.24)
When a used belt is installed	6.0 – 7.0 (0.24 – 0.28)	6.0 – 7.0 (0.24 – 0.28)	6.0 – 7.0 (0.24 – 0.28)
Spark plug gap mm (in.)			
BPR6ES, W20EPR, BPR5ES or W16EPR	0.7 – 0.8 (0.028 – 0.031)	0.7 – 0.8 (0.028 – 0.031)	0.7 – 0.8 (0.028 – 0.031)
BPR6ES-11, W20EPR11, BPR6EA-11, W20EPR-S11, BPR5ES-11 or W16EPR-11	1.0 – 1.1 (0.040 – 0.043)** ⁵	1.0 – 1.1 (0.040 – 0.043)	–
Ignition timing	4° ± 2° BTDC, 3° ± 2° BTDC* ⁴ , 5° ± 2° BTDC* ¹	4° ± 2° BTDC, 2° ± 2° BTDC* ⁴ , 5° ± 2° BTDC* ¹	4° ± 2° BTDC
Engine idle speed r/min.	800 ± 50, 750 +150* ² , –100* ³ , 800 ± 100* ³ , 750 ± 100* ¹	M/T: 800 ± 50 A/T: 850 ± 50, 800 ± 100* ¹	800 ± 50
Idle mixture	1.0 ± 0.5%	1.0 ± 0.5%	1.0 ± 0.5%
Dash pot operating speed r/min.	1,800 ± 200, 1,500 ± 200* ⁴	M/T: 1,800 ± 200 A/T: 1,500 ± 200, 1,200 ± 200* ⁴	1,800 ± 200
Intake manifold vacuum at idle mmHg (in.Hg)	Approx. 500 (20), Approx. 530 (21)* ¹	Approx. 500 (20), Approx. 530 (21)* ¹	Approx. 500 (20)
Valve clearance (on hot engine)			
Intake mm (in.)	0.15 (0.0059)* ⁶ , 0.20 (0.0079)* ⁷	0.15 (0.0059)* ⁶ , 0.20 (0.0079)* ⁷	0.15 (0.0059)
Exhaust mm (in.)	0.25 (0.0098)	0.25 (0.0098)	0.25 (0.0098)
Battery electrolyte specific gravity [at 20°C (68°F)]	1.220 – 1.290	1.220 – 1.290	1.220 – 1.290

NOTE

*¹: <MPI>*²: <FBC with a travelled distance of 500 km (300 miles) or less>*³: <FBC with a travelled distance of 500 km (300 miles) or more>*⁴: <Vehicles with variable-venturi carburettor>*⁵: <FBC>*⁶: Vehicles built up to May 1992*⁷: Vehicles built from June 1992

Items	4G13	4G15	4G16
Limit			
Opening pressure of radiator cap kPa (kg/cm ² , psi)	65 (0.65, 9.2)	65 (0.65, 9.2)	65 (0.65, 9.2)
Engine compression pressure, min. kPa (kg/cm ² , psi)	1,040 (10.4, 148)* ¹ , 1,000 (10.0, 142)* ²	960 (9.6, 136)	960 (9.6, 136)
Engine compression pressure difference between each cylinder, max. kPa (kg/cm ² , psi)	100 (1.0, 14)	100 (1.0, 14)	100 (1.0, 14)

NOTE

*¹: Vehicles built up to May 1990*²: Vehicles built from June 1990

Items	4G37* ¹	4G61	4G67* ²	4D65
Standard value				
Opening pressure of radiator cap kPa (kg/cm ² , psi)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)
Drive belt deflection mm (in.)				
Alternator				
When checked	8.0 – 11.0 (0.31 – 0.43)	9.0 – 11.5 (0.35 – 0.45)	9.0 – 11.5 (0.35 – 0.45)	7.0 – 10.0 (0.28 – 0.39)
When a new belt is installed	6.5 – 8.0 (0.26 – 0.31)	7.5 – 9.0 (0.30 – 0.35)	7.5 – 9.0 (0.30 – 0.35)	—
When a used belt is installed	9.5 (0.37)	10 (0.39)	10 (0.39)	—
Power steering oil pump	6.0 – 9.0 (0.24 – 0.35)	6.0 – 9.0 (0.24 – 0.35)	6.0 – 9.0 (0.24 – 0.35)	6.0 – 9.0 (0.24 – 0.35)
Air conditioner compressor				
When checked	7.0 – 8.0 (0.28 – 0.31)	Approx. 8.0 (0.31)	Approx. 8.0 (0.31)	7.0 – 8.0 (0.28 – 0.31)
When a new belt is installed	5.0 – 6.0 (0.20 – 0.24)	5.0 – 5.5 (0.20 – 0.22)	5.0 – 5.5 (0.20 – 0.22)	6.0 – 7.0 (0.24 – 0.28)
When a used belt is installed	7.0 – 8.0 (0.28 – 0.31)	6.0 – 7.0 (0.24 – 0.28)	6.0 – 7.0 (0.24 – 0.28)	7.0 – 8.0 (0.28 – 0.31)
Spark plug gap mm (in.)				
BPR6ES or W20EPR	—	0.7 – 0.8 (0.028 – 0.031)	0.7 – 0.8 (0.028 – 0.031)	—
BPR6ES-11 or W20EPR11	1.0 – 1.1 (0.040 – 0.043)	—	—	—
Ignition timing	5° ± 2° BTDC	5° ± 2° BTDC	5° ± 2° BTDC	—
Injection timing	—	—	—	7° ATDC
[Dial gauge reading mm (in.)]				[0.97 – 1.03 (0.038 – 0.041)]
Engine idle speed r/min.	800 ± 100	850 ± 100	850 ± 100	750 ± 30
Carbon monoxide concentration	—	1.5 ± 0.5%* ²	1.5 ± 0.5%* ²	—
Intake manifold vacuum at idle mmHg (in.Hg)	Approx. 510 (21)	Approx. 455 (18)	Approx. 465 (18)	—
Valve clearance (on hot engine)				
Intake mm (in.)	0.15 (0.0059)	—	—	0.25 (0.0098)
Exhaust mm (in.)	0.25 (0.0098)	—	—	0.25 (0.0098)

NOTE

*¹: Vehicles built from May 1989*²: <Vehicles without catalytic converter>*²: Vehicles built from Dec. 1989

Items	4G37* ¹	4G61	4G67* ²	4D65
Timing belt tension torque Nm (kgm, ft.lbs.)	—	2.6 – 2.8 (0.26 – 0.28, 1.9 – 2.0)	2.6 – 2.8 (0.26 – 0.28, 1.9 – 2.0)	—
Set screw screw-in amount	—	2.5 – 3 turns	2.5 – 3 turns	—
Battery electrolyte specific gravity [at 20°C (68°F)]	1.220 – 1.290	1.220 – 1.290	1.220 – 1.290	1.220 – 1.290
Limit				
Opening pressure of radiator cap kPa (kg/cm ² , psi)	65 (0.65, 9.2)	65 (0.65, 9.2)	65 (0.65, 9.2)	65 (0.65, 9.2)
Engine compression pressure, min. kPa (kg/cm ² , psi)	920 (9.2, 131)	1,040 (10.4, 148)	1,080 (10.8, 154)	1,920 (19.2, 273)
Engine compression pres- sure difference between each cylinder, max. kPa (kg/cm ² , psi)	100 (1.0, 14)	100 (1.0, 14)	100 (1.0, 14)	300 (3.0, 43)

NOTE: *¹: Vehicles built from May 1989*²: Vehicles built from Dec. 1989

Items	4G92*	4G93*	4D68*
Standard value			
Opening pressure of radiator cap kPa (kg/cm ² , psi)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)
Drive belt deflection mm (in.)			
Alternator			
When checked	8.5 – 12.0 (0.33 – 0.47)	8.5 – 12.0 (0.33 – 0.47)	7.0 – 10.0 (0.28 – 0.39)
When a new belt is installed	7.0 – 8.5 (0.28 – 0.33)	7.0 – 8.5 (0.28 – 0.33)	—
When a used belt is installed	9.5 (0.37)	9.5 (0.37)	—
Power steering oil pump	9.5 – 11.5 (0.37 – 0.45)	9.5 – 11.5 (0.37 – 0.45)	5.5 – 8.0 (0.22 – 0.31)
Air conditioner compressor			
When checked	—	—	7.0 – 8.0 (0.28 – 0.31)
When a new belt is installed	—	—	5.0 – 6.0 (0.20 – 0.24)
When a used belt is installed	—	—	7.0 – 8.0 (0.28 – 0.31)
Power steering oil pump and air conditioner compressor			
When checked	6.8 – 7.6 (0.27 – 0.30)	6.8 – 7.6 (0.27 – 0.30)	—
When a new belt is installed	5.5 – 6.0 (0.22 – 0.24)	5.5 – 6.0 (0.22 – 0.24)	—
When a used belt is installed	6.8 – 7.6 (0.27 – 0.30)	6.8 – 7.6 (0.27 – 0.30)	—

NOTE

*: Vehicles built from June 1992

Items	4G92*	4G93*	4D68*
Spark plug gap mm (in.)	1.0 – 1.1 (0.040 – 0.043)	1.0 – 1.1 (0.040 – 0.043)	—
Ignition timing	5° ± 2° BTDC	5° ± 2° BTDC	—
Injection timing [Dial gauge reading mm (in.)]	—	—	9° ATDC [0.97 – 1.03 (0.038 – 0.041)]
Engine idle speed r/min.	800 ± 100	800 ± 100	750 ± 100
Carbon monoxide concentration	1.5 ± 0.5%*2	—	—
Intake manifold vacuum at idle mmHg (in.Hg)	Approx. 500 (20)	Approx. 500 (20)	—
Valve clearance (on hot engine)			
Intake mm (in.)	0.20 (0.008)	—	0.25 (0.0098)
Exhaust mm (in.)	0.30 (0.012)	—	0.25 (0.0098)
Timing belt tension mm (in.)	—	—	4.0 – 5.0 (0.16 – 0.20)
Timing belt tension torque Nm (kgm, ft.lbs.)	—	2.6 – 2.8 (0.26 – 0.28, 1.9 – 2.0)	—
Battery electrolyte specific gravity [at 20°C (68°F)]	1.220 – 1.290	1.220 – 1.290	1.220 – 1.290
Limit			
Opening pressure of radiator cap kPa (kg/cm², psi)	65 (0.65, 9.2)	65 (0.65, 9.2)	65 (0.65, 9.2)
Engine compression pressure, min. kPa (kg/cm², psi)	1,105 (11.1, 158)	1,148 (11.5, 164)	2,560 (25.6, 364)
Engine compression pressure difference between each cylinder, max. kPa (kg/cm², psi)	100 (1.0, 14)	100 (1.0, 14)	300 (3.0, 43)

NOTE

*: Vehicles built from June 1992

<Vehicles for General Export>

Items	4G13	4G15	4G61, 4G67*2	4D65
Standard value				
Opening pressure of radiator cap kPa (kg/cm ² , psi)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)
Drive belt deflection mm (in.)				
Alternator				
When checked	7.0 – 9.0 (0.28 – 0.35)	7.0 – 9.0 (0.28 – 0.35)	9.0 – 11.5 (0.35 – 0.45)	7.0 – 10.0 (0.28 – 0.39)
When a new belt is installed	5.5 – 7.0 (0.22 – 0.28)	5.5 – 7.0 (0.22 – 0.28)	7.5 – 9.0 (0.30 – 0.35)	—
When a used belt is installed	8.0 (0.31)	8.0 (0.31)	10 (0.39)	—
Power steering oil pump	6.0 – 9.0 (0.24 – 0.35)	6.0 – 9.0 (0.24 – 0.35)	6.0 – 9.0 (0.24 – 0.35)	6.0 – 9.0 (0.24 – 0.35)
Air conditioner compressor				
When checked	6.0 – 7.0 (0.24 – 0.28)	6.0 – 7.0 (0.24 – 0.28)	6.0 – 7.0 (0.24 – 0.28)	7.0 – 8.0 (0.28 – 0.31)
When a new belt is installed	5.0 – 6.0 (0.20 – 0.24)	5.0 – 6.0 (0.20 – 0.24)	5.0 – 5.5 (0.20 – 0.22)	6.0 – 7.0 (0.24 – 0.28)
When a used belt is installed	6.0 – 7.0 (0.24 – 0.28)	6.0 – 7.0 (0.24 – 0.28)	6.0 – 7.0 (0.24 – 0.28)	7.0 – 8.0 (0.28 – 0.31)
Spark plug gap mm (in.)	0.7 – 0.8 (0.028 – 0.031)	0.7 – 0.8 (0.028 – 0.031)	0.7 – 0.8 (0.028 – 0.031)	—
Ignition timing	4° ± 2° BTDC	4° ± 2° BTDC, 5° ± 2° BTDC*1, 2° ± 2° BTDC*3	5° ± 2° BTDC	—
Injection timing [Dial gauge reading mm (in.)]	—	—	—	7° ATDC [0.97 – 1.03 (0.038 – 0.041)]
Engine idle speed r/min.	M/T: 800 ± 50*4, 750 ± 50*5 A/T: 850 ± 50*4, 800 ± 50*5	M/T: 800 ± 50*4, 750 ± 50*5 A/T: 850 ± 50*4, 800 ± 50*5 800 ± 100*1	850 ± 100	750 ± 30

NOTE:

*1: <MPI>

*2: Vehicles built from June 1990

*3: <Vehicles with variable-venturi carburettor>

*4: Vehicles built up to Aug. 1990

*5: Vehicles built from Sep. 1990

Items	4G13	4G15	4G61, 4G67*2	4D65
Idle mixture	2.5 ± 0.5%, 1.0 ± 0.5%*2	2.5 ± 0.5%, 1.5 ± 0.5%*1, 1.0 ± 0.5%*2	1.5 ± 0.5%	—
Dash pot operating speed r/min.	M/T: 1,800 ± 200 A/T: 1,200 ± 200*3	M/T: 1,800 ± 200 A/T: 1,500 ± 200, 1,200 ± 200*3	—	—
Intake manifold vacuum at idle mmHg (in.Hg)	Approx. 500 (20)	Approx. 500 (20), Approx. 530 (21)*1	Approx. 455 (18)	—
Valve clearance (on hot engine)				
Intake mm (in.)	0.15 (0.0059)*6, 0.20 (0.0079)*7	0.15 (0.0059)*6, 0.20 (0.0079)*7	—	0.25 (0.0098)
Exhaust mm (in.)	0.25 (0.0098)	0.25 (0.0098)	—	0.25 (0.0098)
Timing belt tension mm (in.)	—	—	—	4.0 – 5.0 (0.16 – 0.20)
Timing belt tension torque Nm (kgm, ft.lbs.)	—	—	2.6 – 2.8 (0.26 – 0.28, 1.9 – 2.0)	—
r/min. during push rod reverse stroke	—	—	2.5 – 3	—
Timing belt "B" tension mm (in.)	5 – 7 (0.20 – 0.28)	5 – 7 (0.20 – 0.28)	5 – 7 (0.20 – 0.28)	5 – 7 (0.20 – 0.28)
Battery electrolyte specific gravity [at 20°C (68°F)]	1.220 – 1.290	1.220 – 1.290	1.220 – 1.290	1.220 – 1.290
Limit				
Opening pressure of radiator cap kPa (kg/cm², psi)	65 (0.65, 9.2)	65 (0.65, 9.2)	65 (0.65, 9.2)	65 (0.65, 9.2)
Engine compression pressure kPa (kg/cm², psi)	1,040 (10.4, 148)*3, 1,000 (10.0, 142)*4	960 (9.6, 136)	1,040 (10.4, 148)	1,920 (19.2, 273)
Engine compression pressure difference between each cylinder kPa (kg/cm², psi)	100 (1.0, 14)	100 (1.0, 14)	100 (1.0, 14)	300 (3.0, 43)

Items	4G92**
Standard value	
Opening pressure of radiator cap kPa (kg/cm², psi)	75 – 105 (0.75 – 1.05, 11 – 15)
Drive belt deflection mm (in.)	
Alternator	
When checked	8.5 – 12.0 (0.33 – 0.47)
When a new belt is installed	7.0 – 8.5 (0.28 – 0.33)
When a used belt is installed	9.5 (0.37)

NOTE

*1: <MPI>

*2: <Vehicles for Hong Kong, Singapore and GCC and vehicles with variable-venturi carburettor>

*3: Vehicles built up to May 1990

*4: Vehicles built from June 1990

*5: <Variable-venturi carburettor>

*6: Vehicles built up to June 1991

*7: Vehicles built from July 1991

*8: Vehicles built from June 1992

Items	4G92*
Power steering oil pump and air conditioner compressor	
When checked	6.8 – 7.6 (0.27 – 0.30)
When a new belt is installed	5.5 – 6.0 (0.22 – 0.24)
When a used belt is installed	6.8 – 7.6 (0.27 – 0.30)
Spark plug gap mm (in.)	1.0 – 1.1 (0.040 – 0.043)
Ignition timing	5° ± 2° BTDC
Engine idle speed r/min.	800 ± 100
CO concentration	0.6% or less
Intake manifold vacuum at idle mmHg (in. Hg)	Approx. 500 (20)
Valve clearance (on hot engine)	
Intake mm (in.)	0.20 (0.008)
Exhaust mm (in.)	0.30 (0.012)
Battery electrolyte specific gravity [at 20°C (68°F)]	1.220 – 1.290
Limit	
Opening pressure of radiator cap kPa (kg/cm ² , psi)	65 (0.65, 9.2)
Engine compression pressure kPa (kg/cm ² , psi)	1,105 (11.1, 158)
Engine compression pressure difference between each cylinder kPa (kg/cm ² , psi)	100 (1.0, 14)

NOTE

*: Vehicles built from June 1992

Items	4G92*
Standard value	
Opening pressure of radiator cap kPa (kg/cm ² , psi)	65 (0.65, 9.2)
Engine compression pressure kPa (kg/cm ² , psi)	1,105 (11.1, 158)
Engine compression pressure difference between each cylinder kPa (kg/cm ² , psi)	100 (1.0, 14)
When checked	
When a new belt is installed	
When a used belt is installed	

NOTE

*: Vehicles for Hong Kong, Singapore and GCC and vehicles with variable-venturi carburetors

** Vehicles built up to May 1990

** Vehicles built from June 1990

** Vehicles built up to June 1991

** Vehicles built from July 1991

** Vehicles built from June 1992

<Vehicles for Australia>

Items	4G15	4G61 ^{*3}	4G92 ^{*3}
Standard value			
Opening pressure of radiator cap kPa (kg/cm ² , psi)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)	75 – 105 (0.75 – 1.05, 11 – 15)
V-belt deflection mm (in.)			
Alternator			
When checked	7.0 – 9.0 (0.28 – 0.35)	9.0 – 11.5 (0.35 – 0.45)	8.5 – 12.0 (0.33 – 0.47)
When a new belt is installed	5.5 – 7.0 (0.22 – 0.28)	7.5 – 9.0 (0.30 – 0.35)	7.0 – 8.5 (0.28 – 0.33)
When a used belt is installed	8.0 (0.31)	10 (0.39)	9.5 (0.37)
Power steering oil pump	6.0 – 9.0 (0.24 – 0.35)	6.0 – 9.0 (0.24 – 0.35)	–
Air conditioner compressor			
When checked	6.0 – 7.0 (0.24 – 0.28)	6.0 – 7.0 (0.24 – 0.28)	6.8 – 7.6 (0.27 – 0.30)
When a new belt is installed	5.0 – 6.0 (0.20 – 0.24)	5.0 – 5.5 (0.20 – 0.22)	5.5 – 6.0 (0.22 – 0.24)
When a used belt is installed	6.0 – 7.0 (0.24 – 0.28)	6.0 – 7.0 (0.24 – 0.28)	6.8 – 7.6 (0.27 – 0.30)
Spark plug gap mm (in.)	0.7 – 0.8 (0.028 – 0.031)	0.7 – 0.8 (0.028 – 0.031)	1.0 – 1.1 (0.040 – 0.043)
Ignition timing	4° ± 2° BTDC, 2° ± 2° BTDC ^{*4} , 5° ± 2° BTDC ^{*1}	5° ± 2° BTDC	5° ± 2° BTDC
Engine idle speed r/min.	M/T: 800 ± 50 ^{*5} , 750 ± 50 ^{*6} , A/T: 850 ± 50 ^{*5} , 800 ± 50 ^{*6} , 700 ± 100 ^{*1} , 750 ± 100 ^{*2}	750 ± 100	800 ± 100
CO concentration	2.0%, 1.0% ^{*4} (with the secondary air cut-off) 0.6% or less ^{*1, *2}	0.6% or less	0.6% or less
Intake manifold vacuum at idle mmHg (in.Hg)	Approx. 500 (20), Approx. 550 (22) ^{*7}	Approx. 455 (18)	Approx. 500 (20)
Dash pot operating speed r/min.	1,200 ± 200 ^{*4}	–	–
Valve clearance (on hot engine)			
Intake mm(in.)	0.15 (0.059) ^{*8} , 0.20 (0.079) ^{*9}	–	0.20 (0.008)
Exhaust mm(in.)	0.25 (0.0098)	–	0.30 (0.012)
Battery electrolyte specific gravity [at 20°C (68°F)]	1.220 – 1.290	1.220 – 1.290	1.220 – 1.290
Limit			
Opening pressure of radiator cap kPa (kg/cm ² , psi)	65 (0.65, 9.2)	65 (0.65, 9.2)	65 (0.65, 9.2)
Engine compression pressure kPa (kg/cm ² , psi)	960 (9.6, 136)	960 (9.6, 136)	1,105 (11.1, 158)
Engine compression pressure difference between each cylinder kPa (kg/cm ² , psi)	100 (1.0, 14)	100 (1.0, 14)	100 (1.0, 14)

NOTE

^{*1}: <MPI> – Vehicles built from May 1989^{*2}: <MPI> – Vehicles built from June 1990^{*3}: Vehicles built from June 1990^{*10}: Power steering oil pump and air conditioner compressor^{**}: <Variable-venturi carburettor>^{*}: Vehicles built up to Aug. 1990^{**}: Vehicles built from Sep. 1990^{*7}: <MPI>^{*}: Vehicles built up to May 1992^{**}: Vehicles built from June 1992

TORQUE SPECIFICATIONS

E11CC-

Items	Nm	kgm	ft.lbs.
Engine mount bracket nut and bolt	50 – 65	5.0 – 6.5	36 – 47
Engine mount insulator nut (large)	90 – 110	9.0 – 11	65 – 80
Engine mount insulator nut (small)	45 – 60	4.5 – 6.0	33 – 43
Front roll stopper insulator nut	45 – 60	4.5 – 6.0	33 – 43
Rear roll stopper insulator nut	45 – 60	4.5 – 6.0	33 – 43
Accelerator cable adjusting bolt	4 – 6	0.4 – 0.6	3 – 4
Control wiring harness protector to air intake plenum	4 – 6	0.4 – 0.6	3 – 4
Air conditioner compressor to bracket	23 – 27	2.3 – 2.7	17 – 20
Front exhaust pipe clamp bolt	20 – 30	2.0 – 3.0	14 – 22
Front exhaust pipe to exhaust manifold	30 – 40	3.0 – 4.0	22 – 29
Oil pan bolt	6 – 8	0.6 – 0.8	4 – 6
Oil pan drain plug	35 – 45	3.5 – 4.5	25 – 33
Water pump pulley bolt	8 – 10	0.8 – 1.0	6 – 7
Timing belt upper cover	10 – 12	1.0 – 1.2	7 – 9
Timing belt lower cover	10 – 12	1.0 – 1.2	7 – 9
<4G1>			
Spark plug	20 – 30	2.0 – 3.0	14 – 22
Power steering oil pump to bracket	45 – 55	4.5 – 5.5	33 – 40
Rocker cover bolt	1.5 – 2.0	0.15 – 0.20	1.1 – 1.4
Rocker arm shaft bolt	20 – 27	2.0 – 2.7	14 – 20
Camshaft sprocket bolt	65 – 75	6.5 – 7.5	47 – 54
Distributor mounting nut	10 – 13	1.0 – 1.3	7 – 9
Crankshaft sprocket bolt	70 – 100	7.0 – 10	51 – 72
Crankshaft pulley to crankshaft sprocket	12 – 15	1.2 – 1.5	9 – 11
Cylinder head bolt (cold engine)	70 – 75	7.0 – 7.5	51 – 54
Intake manifold stay <Carburettor>	21 – 31	2.1 – 3.1	15 – 22
<MPI>	18 – 25	1.8 – 2.5	13 – 18
Air pipe to engine <FBC>	10 – 14	1.0 – 1.4	7 – 10
Timing belt tensioner	20 – 27	2.0 – 2.7	14 – 20
Air conditioner tension pulley bracket	18 – 22	1.8 – 2.2	13 – 15
Flywheel assembly <M/T> or drive plate <A/T> to engine	130 – 140	13 – 14	94 – 100
Front exhaust pipe to exhaust manifold	40 – 60	4.0 – 6.0	29 – 43
High-pressure fuel hose bolt	4 – 6	0.4 – 0.6	3 – 4
<4G6>			
Spark plug	20 – 30	2.0 – 3.0	14 – 22
Engine mount bracket to bracket	17 – 26	1.7 – 2.6	12 – 19
Front engine support bracket to bracket	17 – 26	1.7 – 2.6	12 – 19
Control wiring harness clamp bolt	10 – 12	1.0 – 1.2	7 – 9
Power steering oil pump to bracket	35 – 45	3.5 – 4.5	25 – 33
Rocker cover bolt	2.5 – 3.5	0.25 – 0.35	2 – 3
Center cover bolt	2.5 – 3.5	0.25 – 0.35	2 – 3
Camshaft sprocket bolt	80 – 100	8.0 – 10	58 – 72
Camshaft bearing cap bolt	19 – 21	1.9 – 2.1	14 – 15
Crankshaft angle sensor nut	10 – 13	1.0 – 1.3	7 – 9
Throttle body stay nut	15 – 22	1.5 – 2.2	11 – 16
Air cleaner body installation bolt	8 – 10	0.8 – 1.0	6 – 7
Crankshaft sprocket bolt	110 – 130	11 – 13	80 – 94

Items	Nm	kgm	ft.lbs.
Timing belt B tensioner bolt <4G67>	15-22	1.5-2.2	11-16
Crankshaft pulley to crankshaft sprocket	20-30	2.0-3.0	14-22
Cylinder head bolt (cold engine)	105-115	10.5-11.5	76-83
Intake manifold stay	25-30	2.5-3.5	18-22
Tension rod to bracket	35-55	3.5-5.5	25-40
Auto tensioner bolt	20-27	2.0-2.7	14-20
Tensioner pulley bolt	43-55	4.3-5.5	31-40
Timing belt B tensioner bolt	15-22	1.5-2.2	9-11
Air conditioner tension pulley bracket	23-27	2.3-2.7	17-20
<4D65>			
Camshaft sprocket bolt	80-100	8.0-10	58-72
Air conditioner tension pulley bracket to bracket	18-22	1.8-2.2	13-16
Air conditioner tension pulley bracket to engine	12-15	1.2-1.5	9-11
Cylinder head bolt (cold engine)	115-125	11.5-12.5	83-90
Rocker cover bolt	5-7	0.5-0.7	4-5
Rocker arm shaft bolt	28-32	2.8-3.2	20-23
Camshaft bearing cap bolt	19-21	1.9-2.1	14-15
Rocker shaft support bolt	20-27	2.0-2.7	14-20
Crankshaft sprocket bolt	110-130	11-13	80-94
Crankshaft pulley bolt	20-30	2.0-3.0	14-22
Timing belt front lower cover bolt (large)	12-15	1.2-1.5	9-11
Timing belt idler bolt	43-55	4.3-5.5	31-40
Tensioner spacer bolt	12-15	1.2-1.5	9-11
Timing belt tensioner bolt	43-55	4.3-5.5	31-40
Timing belt B tensioner bolt	15-22	1.5-2.2	11-16
Injection pipe assembly	23-27	2.3-2.7	17-20
Engine oil cooler eye bolt	40-45	4.0-4.5	29-33
Oil level gauge bolt	45-60	4.5-6.0	33-43
Glow plug	15-20	1.5-2.0	11-14
Glow plug plate to glow plug	1.0-1.5	0.10-0.15	0.7-1.1
Intake manifold bracket A	12-15	1.2-1.5	9-11
Intake manifold bracket B	12-15	1.2-1.5	9-11
Air cleaner bracket	4-6	0.4-0.6	3-4
Power steering oil pump bolt	45-55	4.5-5.5	30-40
Alternator harness clamp	2.5-4.0	0.25-0.40	2-3
<4G37>			
Spark plug	20-30	2.0-3.0	14-22
Power steering oil pump to bracket	45-55	4.5-5.5	33-40
Rocker cover bolt	5-7	0.5-0.7	4-5
Rocker arm shaft bolt (large)	19-21	1.9-2.1	14-15
(small)	10-12	1.0-1.2	7-9
Camshaft sprocket bolt	80-100	8.0-10.0	58-72
Distributor mounting nut	10-13	1.0-1.3	7-9
Crankshaft pulley to crankshaft sprocket	15-18	1.5-1.8	11-13
Cylinder head bolt (cold engine)	70-75	7.0-7.5	51-54
Intake manifold stay	18-25	1.8-2.5	13-18
Timing belt tensioner	22-30	2.2-3.0	16-22
Air conditioner tension pulley bracket	18-22	1.8-2.2	13-15
Oil pan nut	5-7	0.5-0.7	4-5

Items	Nm	kgm	ft.lbs.
<4G9>*			
Rocker cover bolt	3.0 – 3.5	0.3 – 0.35	2.2 – 2.5
Rocker arm shaft bolt	29 – 35	2.9 – 3.5	21 – 25
Camshaft sprocket bolt	80 – 100	8.0 – 10.0	58 – 72
Camshaft arm bolt<4G93>	9 – 12	0.9 – 1.2	6.5 – 8.7
Camshaft bearing cap bolt	20 – 30	2.0 – 3.0	14.5 – 22
Front exhaust pipe to exhaust manifold	40 – 50	4.0 – 5.0	29 – 36
Front exhaust pipe clamp bolt	20 – 30	2.0 – 3.0	14.5 – 22
Oil screen bolt	15 – 22	1.5 – 2.2	11 – 16
Transfer mounting bolt	55 – 60	5.5 – 6.0	40 – 43
Drive shaft center bearing mounting bolt	36 – 46	3.6 – 4.6	26 – 33
Bell housing cover bolt	8 – 10	0.8 – 1.0	6 – 7
Fuel high pressure hose bolt	4 – 6	0.4 – 0.6	3 – 4
Water inlet fitting, thermostat and thermostat case assembly bolt	22 – 25	2.2 – 2.5	16 – 18
Timing belt upper and lower cover	8 – 12	0.8 – 1.2	6 – 9
Cylinder head bolt (cold engine)	75→0→20	7.5→0→2.0	54→0→14
Intake manifold stay bolt	27 – 34	2.7 – 3.4	20 – 25
Center cover bolt	2.5 – 3.5	0.25 – 0.35	2 – 3
Crankshaft pulley bolt	180 – 190	18 – 19	130 – 137
Flywheel assembly bolt <M/T> or drive plate bolt <A/T>	95 – 105	9.5 – 10.5	69 – 76
Timing belt tensioner bolt	20 – 27	2.0 – 2.7	14 – 20
Tensioner spacer bolt	40 – 50	4 – 5	29 – 36
Tension pulley bolt	45 – 55	4.5 – 5.5	33 – 40
Tension pulley arm bolt	40 – 50	4 – 5	29 – 36
Auto tensioner bolt	12 – 15	1.2 – 1.5	8.7 – 10.8
Clamp high pressure hose of air conditioner	9 – 14	0.9 – 1.4	7 – 10
Engine mount bracket nut	40 – 55	4.0 – 5.5	29 – 40
Power steering oil pump to bracket	20 – 27	2.0 – 2.7	14 – 20
<4D68>*			
Rocker cover bolt	5 – 7	0.5 – 0.7	4 – 5
Rocker arm shaft bolt	28 – 32	2.8 – 3.2	20 – 23
Camshaft bearing cap bolt	19 – 21	1.9 – 2.1	14 – 15
Camshaft sprocket bolt	80 – 100	8.0 – 10.0	58 – 72
Drain plug	35 – 45	3.5 – 4.5	25 – 33
Oil pan	6 – 8	0.6 – 0.8	4 – 6
Bell housing cover	8 – 10	0.8 – 1.0	6 – 7
Crankshaft bolt	110 – 130	11.0 – 13.0	80 – 94
Flywheel bolt	130 – 140	13.0 – 14.0	94 – 101
Oil level gauge	9 – 11	0.9 – 1.1	6.5 – 8
Glow plug plate to glow plug	1.0 – 1.5	0.10 – 0.15	0.7 – 1.1
Glow plug	15 – 20	1.5 – 2.0	11 – 14
Thermostat case assembly	19 – 28	1.9 – 2.8	14 – 20
Timing belt upper cover bolt	10.0 – 12.0	1.0 – 1.2	7.0 – 9.0
Engine hanger bolt	10.0 – 13.0	1.0 – 1.3	7.0 – 9.0

NOTE

*: Vehicles built from June 1992

Items	Nm	kgm	ft.lbs.
Rocker shaft support bolt	20 – 27	2.0 – 2.7	14 – 20
Cylinder head bolt (cold engine)	90→0→40	9.0→0→4.0	65→0→29
Fuel injection pipe	23 – 27	2.3 – 3.7	17 – 27
Front exhaust pipe to exhaust manifold	40 – 50	4.0 – 5.0	29 – 36
Crankshaft pulley bolt	20 – 30	2.0 – 3.0	14 – 22
Drive shaft center bearing mounting bolt	36 – 46	3.6 – 4.6	26 – 33
Timing belt B tensioner bolt	15 – 22	1.5 – 2.2	11 – 16
Power steering oil pump to bracket	35 – 45	3.5 – 4.5	25 – 33
Engine oil cooler eye bolt	40 – 45	4.0 – 4.5	29 – 33

LUBRICANTS

E11CD--

Items	Recommended lubricant	Quantity lit. (U.S.qts., Imp.qts.)
Engine oil (API classification)		
Petrol-powered vehicles		
Vehicles for Europe		
<4G1>	SE or higher* ¹ SG* ²	3.4 (3.6, 3.0)** 3.3 (3.5, 2.9)* ³
<4G37>	SE or higher* ¹ SG* ²	3.9 (4.1, 3.4)** 3.8 (4.0, 3.3)* ³
<4G6>	SE or higher* ¹ SG* ²	4.4 (4.6, 3.9)** 4.3 (4.5, 3.8)* ³
<4G9>	SG	3.8 (4.0, 3.3)
Vehicles for Australia		
<4G1>	SE or higher	3.4 (3.6, 3.0)** 3.3 (3.5, 2.9)* ³
<4G6>	SE or higher	4.4 (4.6, 3.9)** 4.3 (4.5, 3.8)* ³
<4G9>	SE or higher	3.8 (4.0, 3.3)
Vehicles for General Export		
<4G1>	SC or higher* ³ SD or higher* ⁴ SE or higher* ⁵	3.4 (3.6, 3.0)** 3.3 (3.5, 2.9)* ³
<4G61>	SC or higher* ³ SD or higher* ⁴ SE or higher* ⁵	4.4 (4.6, 3.9)** 4.3 (4.5, 3.8)* ³
<4G9>	SE or higher	3.8 (4.0, 3.3)
Diesel-powered vehicles	CC or higher* ⁶ CD or higher* ⁷	5.1 (5.4, 4.5)

NOTE

*¹: Vehicles built up to May 1990*²: Vehicles built from June 1990*³: Vehicles built up to June 1991*⁴: Vehicles built from July 1991 up to May 1992*⁵: Vehicles built from June 1992 (Class SD oil permissible if class SE or higher oil is not available)*⁶: Vehicles for Europe built up to June 1991 and General Export*⁷: Vehicles for Europe built from July 1991*⁸: Vehicles built up to May 1992*⁹: Vehicles built from June 1992

SEALANTS AND ADHESIVES

E11CE-

Items	Specified sealant	Quantity
Rocker cover and semi-circular packing	3M ATD Part No. 8660 or equivalent	As required
Rocker cover and bearing cap	3M ATD Part No. 8660 or equivalent	As required
Oil pan and cylinder block	MITSUBISHI GENUINE PART MD970389 or equivalent <Semi-drying sealant>	
Flywheel assembly <M/T> or drive plate <A/T> mounting bolt threads	3M Stud locking 4170 or equivalent	
Thermostat case assembly and cylinder block seal	MITSUBISHI GENUINE PART MD970389 or equivalent <4G9> Three bond 1207 F <4D68>* <Semi-drying sealant>	

NOTE

*: Vehicles built from June 1992

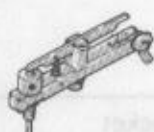
Items	Recommended lubricant	Quantity (liters, imp. pts.)
Engine oil (API classification)		
Petrol-powered vehicles		
Vehicles for Europe		
<4B1>	SE or higher**	3.4 (4.5)
<4G3>	SE or higher**	3.8 (5.0)
<4G2>	SE or higher**	4.4 (5.8)
<4G1>	SE or higher**	4.4 (5.8)
Vehicles for Australia		
<4B1>	SE or higher**	3.4 (4.5)
<4G3>	SE or higher**	3.8 (5.0)
<4G2>	SE or higher**	4.4 (5.8)
<4G1>	SE or higher**	4.4 (5.8)
Vehicles for General Export		
<4B1>	SE or higher**	3.4 (4.5)
<4G3>	SE or higher**	3.8 (5.0)
<4G2>	SE or higher**	4.4 (5.8)
<4G1>	SE or higher**	4.4 (5.8)
Diesel-powered vehicles		
<4B1>	SE or higher**	3.4 (4.5)
<4G3>	SE or higher**	3.8 (5.0)
<4G2>	SE or higher**	4.4 (5.8)
<4G1>	SE or higher**	4.4 (5.8)

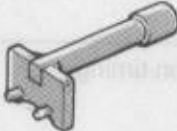
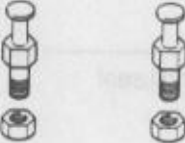
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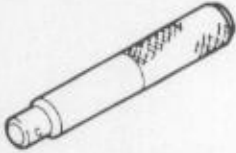
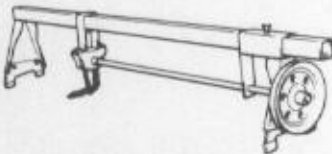
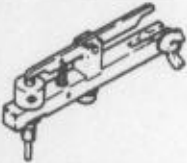
** Vehicles built up to May 1992
 ** Vehicles built from June 1992
 ** Vehicles built up to June 1991
 ** Vehicles built from July 1991 up to May 1992
 ** Vehicles built from June 1992 (Class 2D oil grade) or higher oil grade (not available)
 ** Vehicles for Europe built up to June 1991 and General Export
 ** Vehicles for Europe built from July 1991
 ** Vehicles built up to May 1992
 ** Vehicles built from June 1992

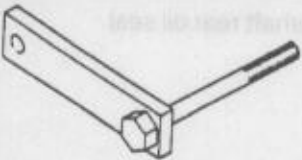
SPECIAL TOOLS

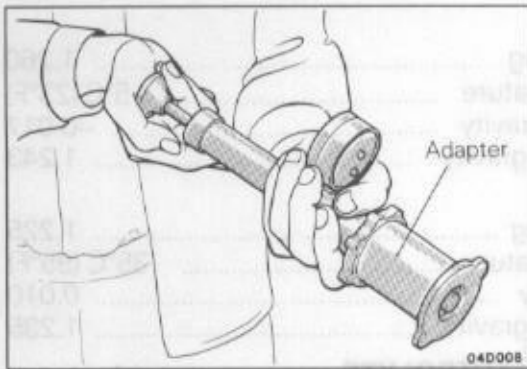
E11DA-

Tool	Number	Name	Use
	MD998299	MAS screwdriver	Adjustment of mixture adjusting screw <4G1, 4G6>
	MD998720	Prestroke measuring adaptor	Adjustment of the injection timing <4D65>
	MD998360	Cylinder head bolt wrench	Removal and installation of cylinder head bolt <4G1, 4G37>
	MD998051	Cylinder head bolt wrench	Removal and installation of cylinder head bolt <4G6, 4D65>
	MD998364	Camshaft oil seal installer	Press-in of the camshaft oil seal <4D65, 4D68, 4G37>
	MD998306	Camshaft oil seal installer	Press-in of the camshaft oil seal <4G1, 4G6>
	MD998307	Camshaft oil seal installer	Press-in of the camshaft oil seal <4G1, 4G6>
	MD998727	Oil pan gasket cutter	Removal of oil pan
	MD998738	Adjusting screw	Adjustment of timing belt tensioner <4G6>

Tool	Number	Name	Use
	MB990685	Torque wrench	Adjustment of timing belt tensioner <4G6>
	MD998752	Tensioner pulley socket wrench	Adjustment of timing belt tensioner <4G6>
	MB990767	End yoke holder	Removal of crankshaft sprocket <4D65>
	MD998747	Crankshaft pulley holder	Removal of crankshaft sprocket <4G1, 4G6>
	MD998719 MD998754	Crankshaft pulley holder pin	Supporting camshaft pulley Supporting crankshaft pulley <4G1, 4G9>
	MD998713	Camshaft oil seal installer	Installation of camshaft oil seal <4G9>
	MD998716	Crankshaft wrench	Rotation of crankshaft when installing timing belt <4G9>
	MD998717	Crankshaft front oil seal installer	Installation of crankshaft front oil seal <4G9>
	MD998011	Crankshaft rear oil seal installer	Installation of crankshaft rear oil seal <4G1>

Tool	Number	Name	Use
	MD998776	Crankshaft rear oil seal installer	Installation of crankshaft rear oil seal <4G9>
	MB990938	Handle	
	MB991341	Multi-use tester sub assembly	Idle speed inspection <4G1, 4G9>
	ROM pack (for multi-use tester) [For the number, refer to GROUP 00 – Precautions before Service]		
	GENERAL SERVICE TOOL	Cylinder head bolt wrench	Loosening and tightening of cylinder head bolt <4G9>
	GENERAL SERVICE TOOL MZ203827	Mechanic hanger, engine	Supporting engine assembly when removing and installing transmission <4G1, 4G9>
	MD998389	Pre-stroke measuring adapter	Adjusting injection timing <4D68>
	MD998383	Crankshaft front oil seal guide	Installation of crankshaft front oil seal
	MD998382	Crankshaft front oil seal installer	

Tool	Number	Name	Use
	MD998781	Flywheel stopper	Securing the flywheel <4D68>
	MS990938	Handle	
	MD991341	Multi-use tester sub assembly	
	MD991341	ROM pack for multi-use tester	 [For the number refer to GROUP 00- Precautions before Service]
	GENERAL SERVICE TOOL WCE TOOL	Cylinder head bolt wrench	
	GENERAL SERVICE TOOL MD990817	Mechanic support	
	MD990289	Pre-service inspection adjuster	
	MD990283	Crankshaft front oil seal guide	
	MD990282	Crankshaft front oil seal installer	



ENGINE <4G1>

ENGINE ADJUSTMENT <CARBURETTOR>

RADIATOR CAP CHECK

E11FIAB

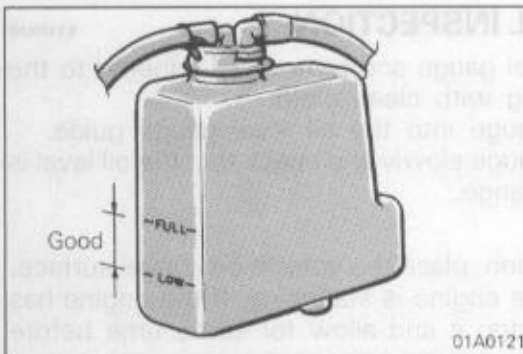
1. Attach an adapter (which fits the cap) to the tester. Increase the pressure until the indicator of the gauge stops moving.
2. Check that the pressure level is maintained at or above the limit.

Standard value: 75 – 105 kPa
(0.75 – 1.05 kg/cm², 11 – 15 psi)
Limit: 65 kPa (0.65 kg/cm², 9.2 psi)

3. Replace the radiator cap if the reading does not remain at or above the limit

NOTE

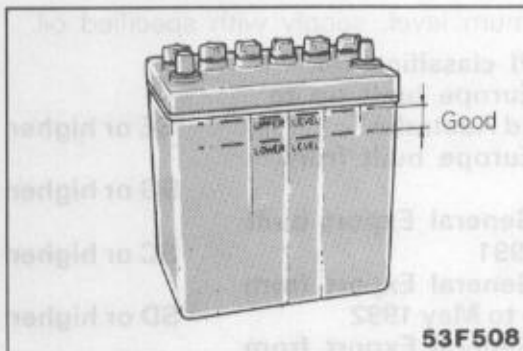
Be sure that the cap is clean before testing, because rust or other foreign material adhered to the cap will cause the measurement to be incorrect.



ENGINE COOLANT INSPECTION

E11FJAC

1. Check that the engine coolant level in the reserve tank is within FULL and LOW limits.
2. Check for presence of oil in the engine coolant.



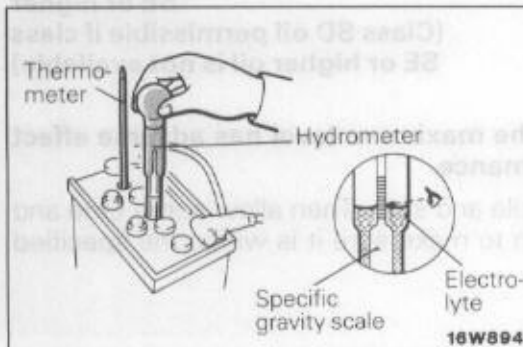
BATTERY ELECTROLYTE LEVEL INSPECTION

E11FLAA

1. Check that the level is between the lower level line and upper level line.
2. If below the lower level line, refill with distilled water.

Caution

Keep sparks, cigarettes and flames away from the battery, because it produces explosive gas.

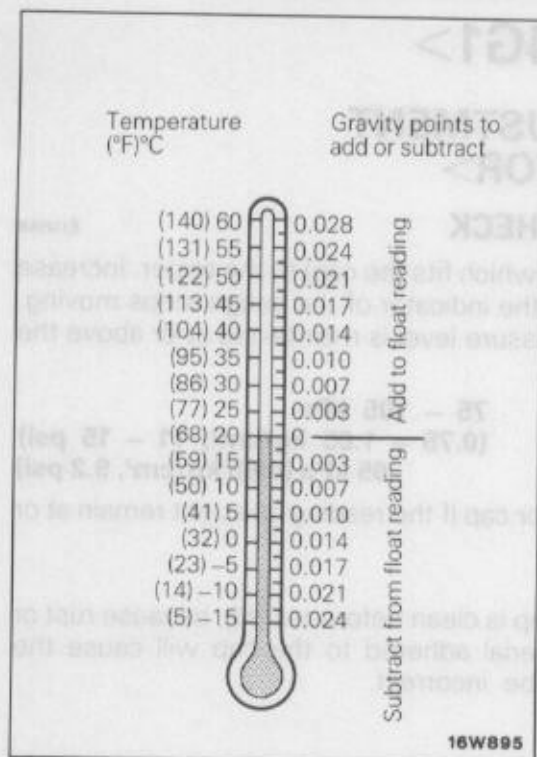


BATTERY ELECTROLYTE SPECIFIC GRAVITY CHECK

E11FMAA

Specific gravity variations caused by temperatures must be considered and corrected to 20°C (68°F) in the battery otherwise specific gravity readings will not indicate the true state of charge.

Standard value: 1.220 – 1.290



Example 1:

Hydrometer reading	1.260
Electrolyte temperature	-5°C (23°F)
Subtract specific gravity	-0.017
Corrected specific gravity	1.243

Example 2:

Hydrometer reading	1.225
Electrolyte temperature	35°C (95°F)
Add specific gravity	0.010
Corrected specific gravity	1.235

ADJUSTMENT OF ELECTROLYTE

When the electrolyte specific gravity of fully charged battery is higher than 1.280 at 20°C (68°F) add distilled water. When lower than 1.220 at 20°C (68°F), charge the battery. Continue the charge so as to give the electrolyte a chance to mix and then read the gravity after another hour of charge to note the effect of the additions.

ENGINE OIL LEVEL INSPECTION

E11FNAE

1. Pull out the oil level gauge and remove oil adhered to the level gauge, wiping with clean cloth.
2. Insert the level gauge into the oil level gauge guide.
3. Pull out the level gauge slowly and check that the oil level is in the illustrated range.

NOTE

1. For this inspection, place the vehicle on a level surface.
2. Check while the engine is stationary. If the engine has been started, stop it and allow for some time before inspection.
4. If below the minimum level, supply with specified oil.

Specified oil: (API classification)

Vehicles for Europe built up to
May 1990 and Australia

SE or higher

Vehicles for Europe built from
June 1990

SG or higher

Vehicles for General Export built
up to June 1991

SC or higher

Vehicles for General Export from
July 1991 up to May 1992

SD or higher

Vehicles for General Export from
June 1992

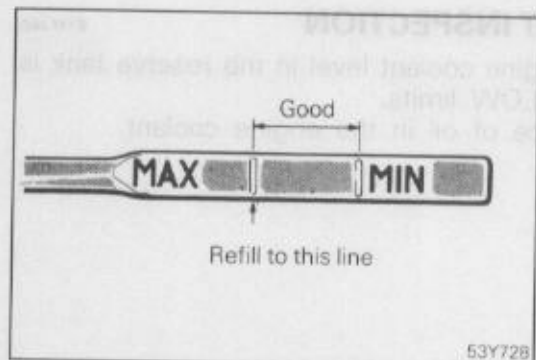
SE or higher

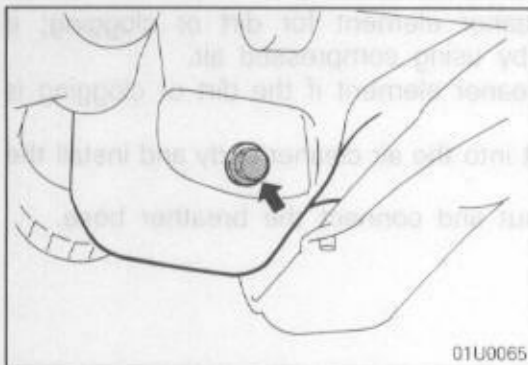
(Class SD oil permissible if class
SE or higher oil is not available)

Caution

Refilling beyond the maximum level has adverse effect
on engine performance.

5. Run the engine at idle and stop. Then allow some time and check oil level again to make sure it is within the specified range.

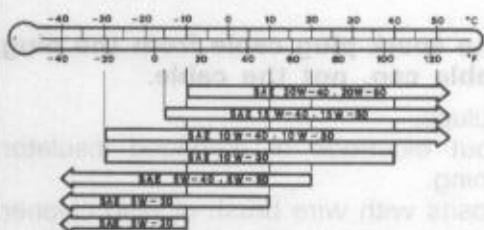




01U0065

PETROL-POWERED VEHICLES

Barometric temperature



72N0025

ENGINE OIL REPLACEMENT

E11FOAF

1. Start the engine and allow it to warm up until the temperature of the engine coolant reaches 80°C to 90°C (176°F to 194°F).
2. Remove the engine oil filler cap.
3. Remove the drain plug to drain oil.

Caution

Take care as the oil could be hot.

4. Fit the drain plug after oil has been drained completely.
5. Refill with specified quantity of oil.

Specified oil: (API classification)

Vehicles for Europe built up to May 1990 and Australia

SE or higher

Vehicles for Europe built from June 1990

SG or higher

Vehicles for General Export built up to June 1991

SC or higher

Vehicles for General Export from July 1991 up to May 1992

SD or higher

Vehicles for General Export from June 1992

SE or higher

(Class SD oil permissible if class SE or higher oil is not available)

Oil quantity:

<Vehicles built up to May 1992>

3.4 lit. (3.6 U.S.qts., 3.0 Imp.qts.)

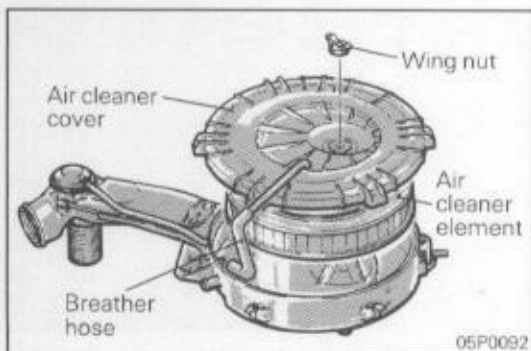
[including 0.4 lit. (0.42 U.S.qts., 0.35 Imp.qts.) in oil filter]

<Vehicles built from June 1992>

3.3 lit. (3.5 U.S.qts., 2.9 Imp.qts.)

[including 0.3 lit. (0.32 U.S.qts., 0.26 Imp.qts.) in oil filter]

6. Install the engine oil filler cap.
7. Check oil level. (Refer to P.11-12.)

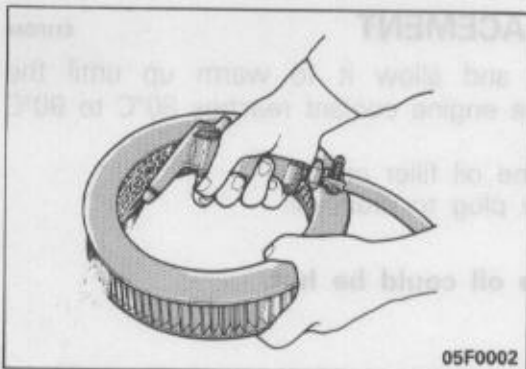


05P0092

AIR CLEANER ELEMENT INSPECTION AND CLEANING

E11FPAJ

1. Disconnect the coupling of the breather hose, and remove the wing nut.
2. Remove the air cleaner cover, and take out the air cleaner element.



3. Check the air cleaner element for dirt or clogging; if necessary, clean by using compressed air.
4. Replace the air cleaner element if the dirt or clogging is serious.
5. Insert the element into the air cleaner body and install the air cleaner cover.
6. Install the wing nut and connect the breather hose.

SPARK PLUG CHECK AND CLEANING

E11FRAF

1. Remove the spark plug cables.

Caution

When pulling off the spark plug cable from the plug, always hold the cable cap, not the cable.

2. Remove the spark plugs.
3. Check for burned out electrode or damaged insulator. Check for even burning.
4. Remove carbon deposits with wire brush or plug cleaner. Remove sand from plug screw with compressed air.
5. Use a plug gap gauge to check that the plug gap is within the standard value range.

Standard value:

Conventional carburettor and variable-venturi carburettor: 0.7 – 0.8 mm (0.028 – 0.031 in.)

FBC: 1.0 – 1.1 mm (0.039 – 0.043 in.)

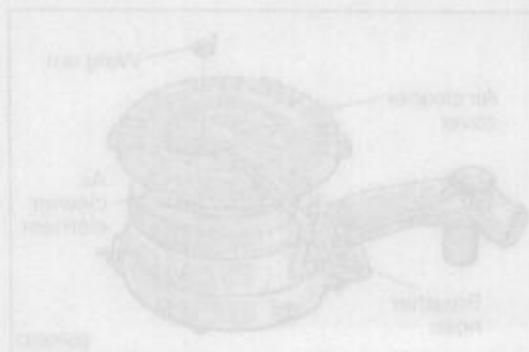
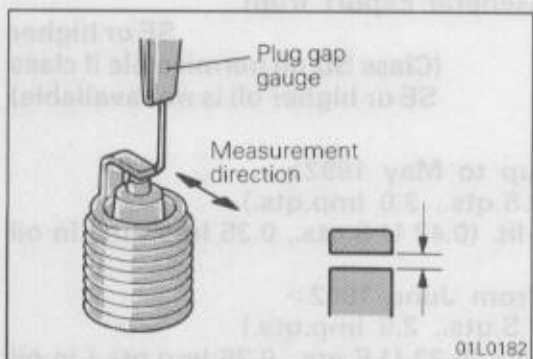
If the plug gap is not within the standard value range, adjust by bending the earth electrode.

6. Clean the engine plug holes.

Caution

Use care not to allow foreign matter in cylinders.

7. Install the spark plugs.



NOTES

DRIVE BELT TENSION INSPECTION

1. Check belt for damage or wear. Confirm that belt is fitted correctly in the pulley groove.

NOTE

If the belt "squalls" or slips, check belt for friction damage or cracks and check pulley contact surface for damage.



2. Check the tension by pulling or pushing at the centre of the belt between pulleys with a force of 100 N (10 kg, 22 lbs.) as indicated in the illustration. Measure drive belt tension.

Standard value:

Alternator	7.0 - 8.0 mm (0.28 - 0.31 in.)
Power steering oil pump	8.0 - 9.0 mm (0.31 - 0.35 in.)
Air conditioner compressor	8.0 - 9.0 mm (0.31 - 0.35 in.)

ALTERNATOR DRIVE BELT TENSION ADJUSTMENT

1. Loosen the nut for holding the alternator.
2. Loosen belt tension adjust lock bolt.
3. Adjust belt tension by turning adjusting bolt.

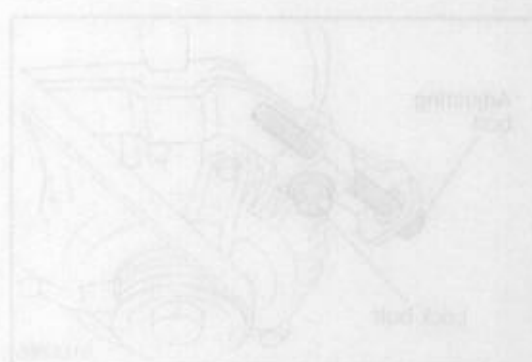
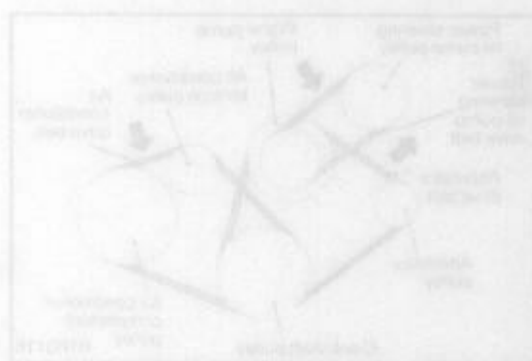
Standard value:

If former belt (with connected tension) is used	8.0 mm (0.31 in.)
If a new belt is used	8.5 - 9.0 mm (0.33 - 0.35 in.)

4. Tighten the lock bolt and nut.
 5. Check the belt tension after driving.
- Standard value: 7.0 - 9.0 mm (0.28 - 0.35 in.)

Caution

If the belt tension is too strong, it is possible that the alternator or water pump bearing is damaged.

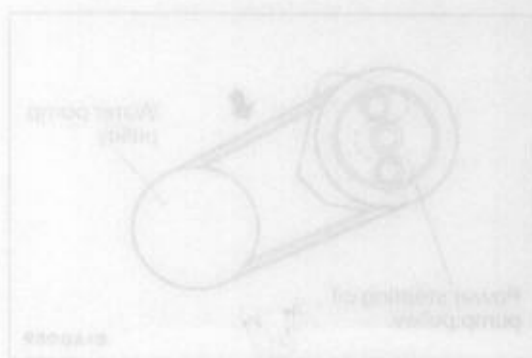


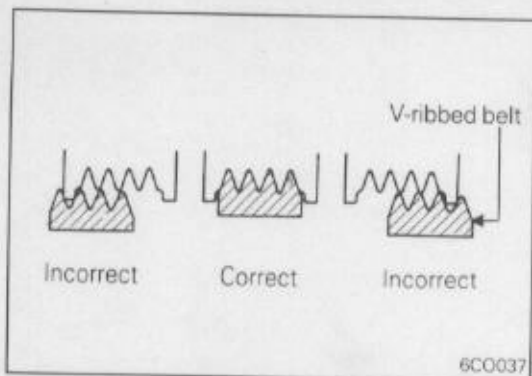
POWER STEERING OIL PUMP DRIVE BELT TENSION ADJUSTMENT

1. Loosen power steering pump fixing bolt.
2. Move power steering pump, tension belt moderately and adjust tension.

Standard value: 8.0 - 9.0 mm (0.31 - 0.35 in.)

3. Tighten fixing bolt.
4. Check belt tension and adjust if necessary.





DRIVE BELT TENSION INSPECTION

E11FQAL0

1. Check belt for damage or wear. Confirm that belt is fitted correctly in the pulley groove.

NOTE

If the belt "squeals" or slips, check belt for friction, damage or breaks and check pulley contact surface for damage.

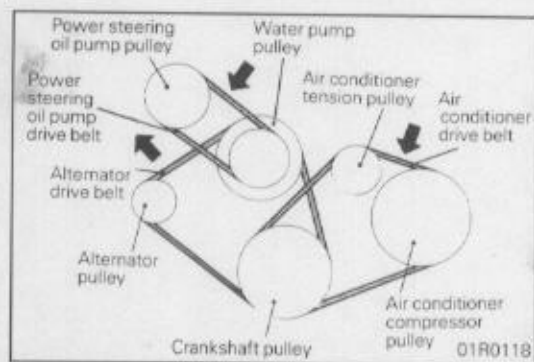
2. Check the tension by pulling or pushing at the centre of the belt between pulleys with a force of 100 N (10 kg, 22 lbs.) as indicated in the illustration. Measure drive belt tension.

Standard value:

Alternator 7.0 – 9.0 mm (0.28 – 0.35 in.)

Power steering oil pump 6.0 – 9.0 mm (0.24 – 0.35 in.)

Air conditioner compressor 6.0 – 7.0 mm (0.24 – 0.28 in.)



ALTERNATOR DRIVE BELT TENSION ADJUSTMENT

1. Loosen the nut for holding the alternator.
2. Loosen belt tension adjuster lock bolt.
3. Adjust belt tension by turning adjusting bolt.

Standard value:

If former belt (with corrected tension) is used 8.0 mm (0.31 in.)

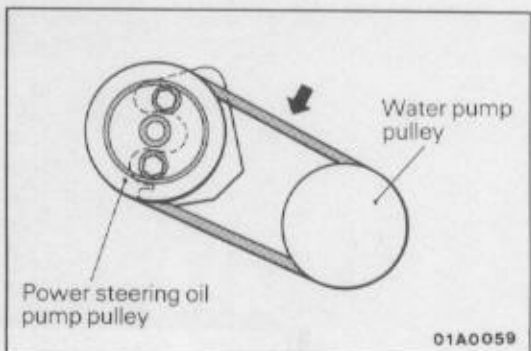
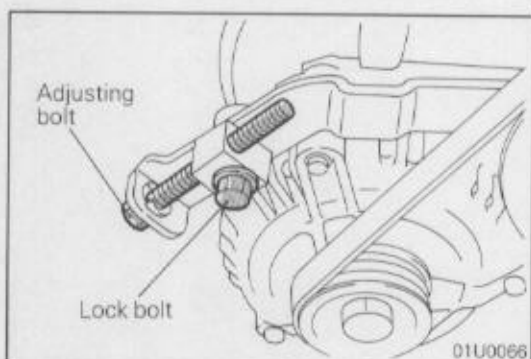
If a new belt is used 5.5 – 7.0 mm (0.22 – 0.28 in.)

4. Tighten the lock bolt and nut.
5. Check the belt tension after driving.

Standard value: 7.0 – 9.0 mm (0.28 – 0.35 in.)

Caution

If the belt tension is too strong, it is possible that the alternator or water pump bearing is damaged.

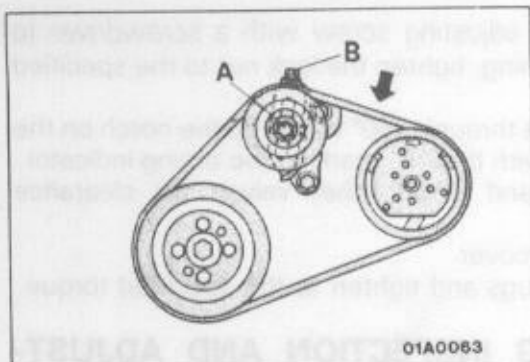


POWER STEERING OIL PUMP DRIVE BELT TENSION ADJUSTMENT

1. Loosen power steering pump fixing bolt.
2. Move power steering pump, tension belt moderately and adjust tension.

Standard value: 6.0 – 9.0 mm (0.24 – 0.35 in.)

3. Tighten fixing bolt.
4. Check belt tension and adjust if necessary.



AIR CONDITIONER COMPRESSOR DRIVE BELT TENSION ADJUSTMENT

1. Loosen tension pulley fixing bolt A.
2. Adjust belt tension with adjusting bolt B.

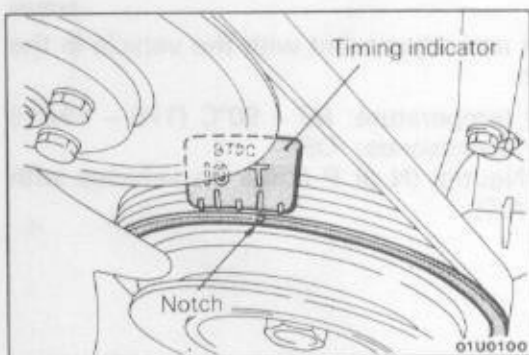
Standard value:

If former belt (with corrected tension) is used
6.0 – 7.0 mm (0.24 – 0.28 in.)

If a new belt is used 5.0 – 6.0 mm (0.20 – 0.24 in.)

3. Tighten fixing bolt A.
4. Check the belt tension after driving.

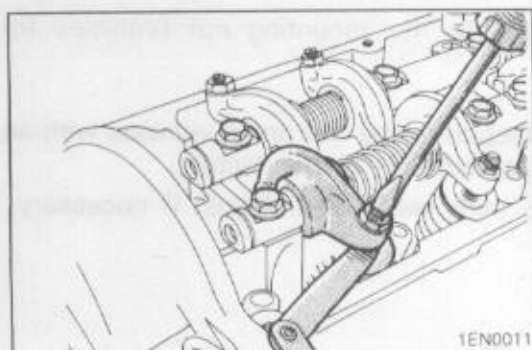
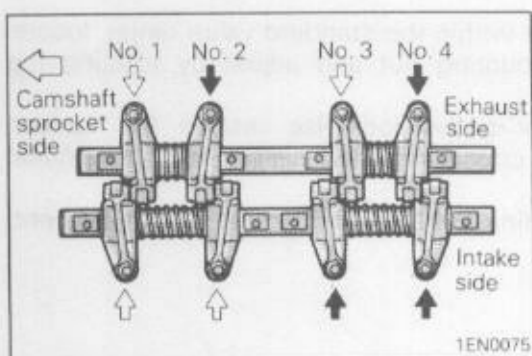
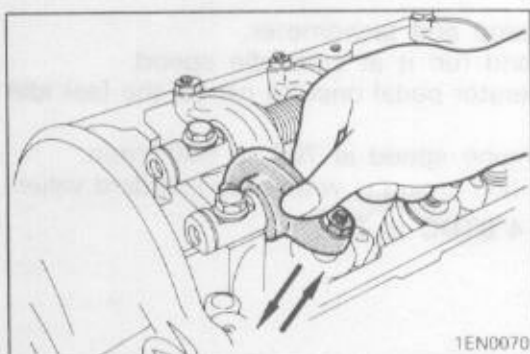
Standard value: 6.0 – 7.0 mm (0.24 – 0.28 in.)



VALVE CLEARANCE INSPECTION AND ADJUSTMENT

E11F085

1. Start the engine and allow it to warm up until the engine coolant temperature reaches 80 to 90°C (176 to 190°F).
2. Remove all spark plugs from the cylinder head for easy inspection.
3. Remove the rocker cover.
4. Turn the crankshaft clockwise until the notch on the pulley is lined up with the "T" mark on the timing indicator.
5. Move the rocker arms on the No. 1 and No. 4 cylinders up and down by hand to determine which cylinder has its piston at the top dead centre on the compression stroke. If both intake and exhaust valve rocker arms have a valve lash, the piston in the cylinder corresponding to these rocker arms is at the top dead centre on the compression stroke.
6. Valve clearance inspection and adjustment can be performed on rocker arms indicated by white arrows ↗ when the No. 1 cylinder piston is at the top dead centre on the compression stroke, and on rocker arms indicated by solid arrows ↘ when the No. 4 cylinder piston is at the top dead centre on the compression stroke.



7. Measure the valve clearance.
If the valve clearance is not as specified, loosen the rocker arm lock nut and adjust the clearance using a feeler gauge while turning the adjusting screw.

Standard value (hot engine):

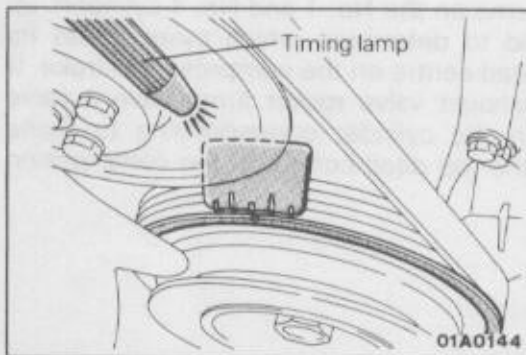
Intake valve	0.15 mm (0.0059 in.)
Exhaust valve	0.25 mm (0.0098 in.)

8. While holding the adjusting screw with a screwdriver to prevent it from turning, tighten the lock nut to the specified torque.
9. Turn the crankshaft through 360° to line up the notch on the crankshaft pulley with the "T" mark on the timing indicator.
10. Repeat steps 7 and 8 on other valves for clearance adjustment.
11. Install the rocker cover.
12. Install the spark plugs and tighten to the specified torque.

IGNITION TIMING INSPECTION AND ADJUSTMENT

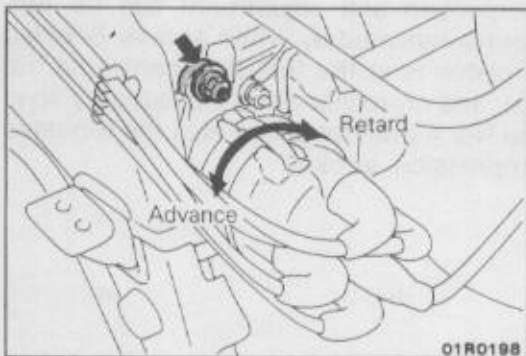
E11FUAJ

1. Perform inspection and adjustment with the vehicle in the following condition.
 - Engine coolant temperature: 80 – 90°C (176 – 194°F)
 - Lamps and all accessories: OFF
 - Transmission: Neutral (N or P range on vehicles with A/T)

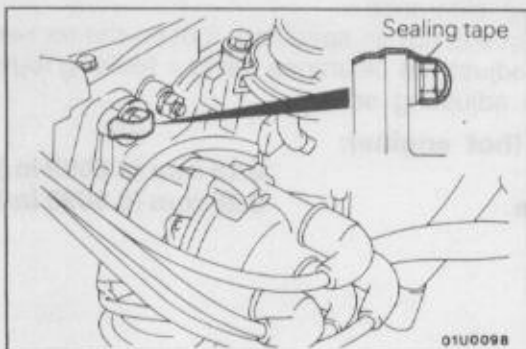


2. Set up a timing lamp and tachometer.
3. Start the engine and run it at curb idle speed.
4. Depress the accelerator pedal once to cancel the fast idle mode. <FBC>
5. Check that the engine speed is 700 to 900 r/min.
6. Check that the ignition timing is within the standard value.

Standard value: 4°BTDC ± 2°



7. If the timing is not within the standard value range, loosen the distributor mounting nut and adjust by rotating the distributor body. Turning distributor body clockwise retards the ignition timing; turning it counterclockwise advances the ignition timing.
8. Tighten the mounting nut after performing the adjustment.



9. Attach sealing tape to the mounting nut (Vehicles for Switzerland).

NOTE

Sealing tape is attached to the nut on all vehicles with an electronic control carburettor at the factory.

10. Check the engine curb idle speed. Adjust if necessary.

ENGINE IDLING SPEED INSPECTION AND ADJUSTMENT

E11FXAW

1. Perform this inspection and adjustment with the vehicle in the following condition.
 - Engine coolant temperature: 80 – 90°C (176 – 194°F)
 - Lamps and all accessories: OFF
 - Transmission: Neutral (N or P range on vehicles with A/T)
 - Steering wheel: Straight forward position (Vehicles with power steering)
2. Set up a timing lamp and tachometer.
3. Start the engine and run it at idle.
4. Depress the accelerator pedal once to cancel the fast idle mode. <FBC>
5. Check the ignition timing. Adjust if necessary.
6. Check the curb idle speed.
If the speed is not within the standard value range, adjust the curb idle speed with the speed adjusting screw.

Standard value:

Conventional carburettor

<M/T>

800 ± 50 r/min.

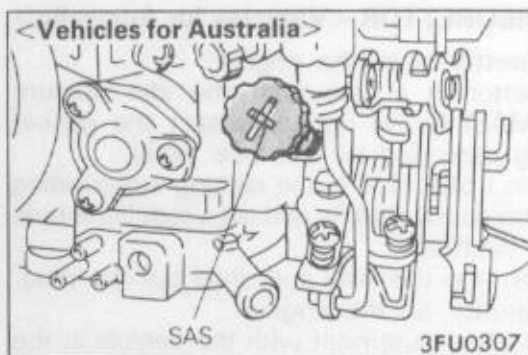
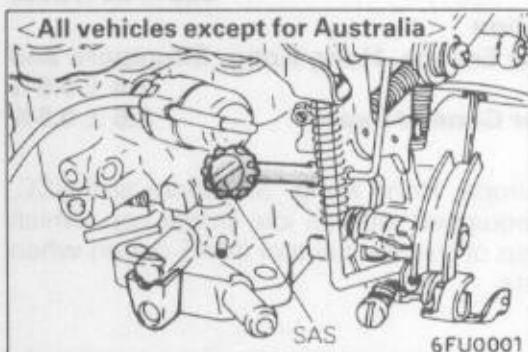
<A/T>

850 ± 50 r/min.

FBC

Until the first 500 km (300 miles) 750 ± $\frac{150}{100}$ r/min.

After 500 km (300 miles) 800 ± 100 r/min.



IDLE MIXTURE INSPECTION AND ADJUSTMENT

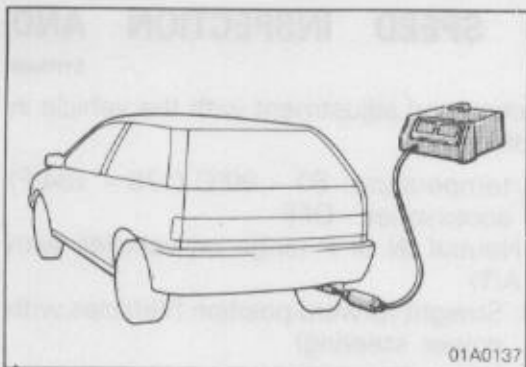
E11FXBF

CONVENTIONAL CARBURETTOR

<All vehicles except for Australia>

1. Perform inspection and adjustment with the vehicle in the following condition.
 - Engine coolant temperature: 80 – 90°C (176 – 194°F)
 - Lamps and all accessories: OFF
 - Transmission: Neutral (N or P range on vehicle with A/T)
 - Steering wheel: Straight forward position (Vehicles with power steering)
2. Set up a timing lamp and tachometer.
3. Start the engine and run at idle.
4. Check the ignition timing. Adjust if necessary.

Standard value: 4°BTDC ± 2°



5. Set up a CO tester.
6. Run the engine at 2,000 to 3,000 r/min. and race it two or three times.
7. Check the curb idle speed and CO concentration. If they are not within the standard value ranges, adjust the curb idle speed and CO concentration to the standard values with the speed adjusting screw (SAS) and mixture adjusting screw (MAS).

Standard value:**Curb idle speed**

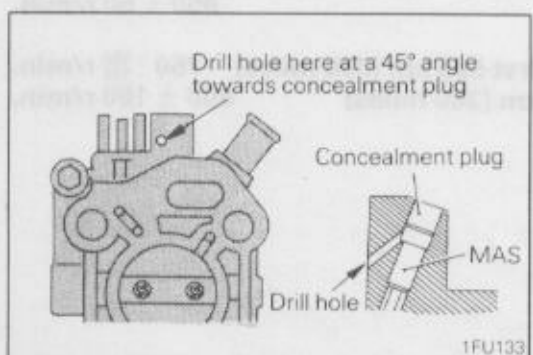
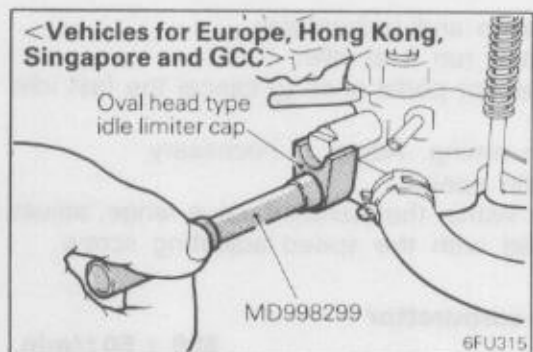
<M/T>

800 ± 50 r/min.

<A/T>

850 ± 50 r/min.**CO concentration****Vehicles for Europe, Hong Kong, Singapore and GCC****1.0 ± 0.5%****Vehicles for General Export****2.5 ± 0.5%****NOTE**

On vehicles for Europe, Hong Kong, Singapore and GCC, the carburettor is equipped with an idle limiter cap, which necessitates the use of the special tool (MAS driver) when making adjustments.

**CONVENTIONAL CARBURETTOR <Vehicles for Australia>**

1. Remove the carburettor from the engine.
2. Clamp the carburettor in a vice with the idle mixture adjusting screw (MAS) facing up (to protect the gasket surface from being damaged by the vice jaws).
3. Drill a 2 mm (5/64 in.) pilot hole in the casting surrounding the mixture adjusting screw (MAS), and then redrill the hole to 3 mm (1/8 in.) diameter.
4. Insert a blunt punch into the hole and drive out the plug.
5. Reinstall the carburettor on the engine.
6. Perform inspection and adjustment with the vehicle in the following condition.
 - Engine coolant temperature: 80 – 90°C (176 – 194°F)
 - Lamps and all accessories: OFF
 - Transmission: Neutral (N or P range on vehicle with A/T)
 - Steering wheel: Straight forward position (Vehicles with power steering)
7. Set up a timing lamp and tachometer.
8. Start the engine and run it at idle.
9. Check the ignition timing. Adjust if necessary.

Standard value: 4° BTDC ± 2°

10. Set up a CO tester.
11. Run the engine for more than 5 seconds at a speed of 2,000 to 3,000 r/min.
12. Run the engine at idle for 2 minutes.
13. Disconnect the white striped vacuum hose from the secondary air control valve and plug the vacuum hose end.

14. Check the curb idle speed and CO concentration. If they are not within the standard value range, adjust the curb idle and CO concentration to the standard value with the speed adjusting screw (SAS) and mixture adjusting screw (MAS).

Standard value:**Curb idle speed**

<M/T>

800 ± 50 r/min.

<A/T>

850 ± 50 r/min.**CO concentration****2.0%**

15. Remove plug from vacuum hose and connect hose to secondary air control valve.
16. Reset the curb speed to the specified range by adjusting the speed adjusting screw, if the engine speed is out of the specified speed range.
17. Install the concealment plug into the hole to seal the idle mixture adjusting screw.

FBC <Vehicles except for Switzerland>**NOTE**

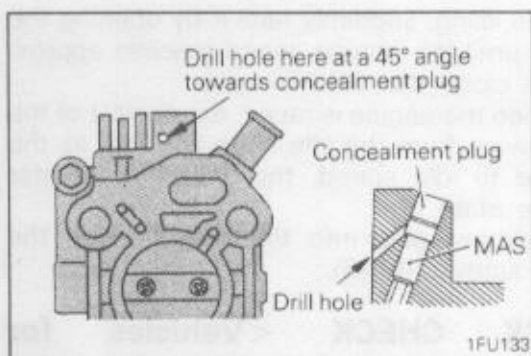
For vehicles for Switzerland, refer to the section "IDLE FEEDBACK CHECK" on P.11-20. Adjustment of idle mixture is not normally required because of closed-loop control of the air/fuel ratio.

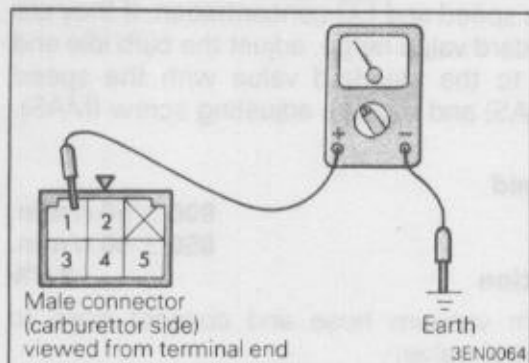
In case an idle mixture adjustment is required for some reason (e.g. overhauling carburettor), the following procedure should be followed.

1. Remove the carburettor from the engine.
2. Clamp the carburettor in a vice with the idle mixture adjusting screw (MAS) facing up (to protect the gasket surface from being damaged by the vice jaws).
3. Drill a 2 mm (5/64 in.) pilot hole in the casting surrounding the mixture adjusting screw (MAS) and then redrill the hole to 3 mm (1/8 in.) diameter.
4. Insert a blunt punch into the hole and drive out the plug.
5. Reinstall the carburettor on the engine.
6. Perform inspection and adjustment with the vehicle in the following condition.
 - Engine coolant temperature: 80 – 90°C (176 – 194°F)
 - Lamps and all accessories: OFF
 - Transmission: Neutral
 - Steering wheel: Straight forward position (Vehicles with power steering)
7. Set up a timing lamp and tachometer.
8. Depress the accelerator pedal once to cancel the fast idle mode.
9. Check the ignition timing. Adjust if necessary.

Standard value: 4° ± 2° BTDC

10. Turn off the ignition switch.
11. Disconnect the negative cable from the battery, wait 5 seconds or more and then reconnect it.



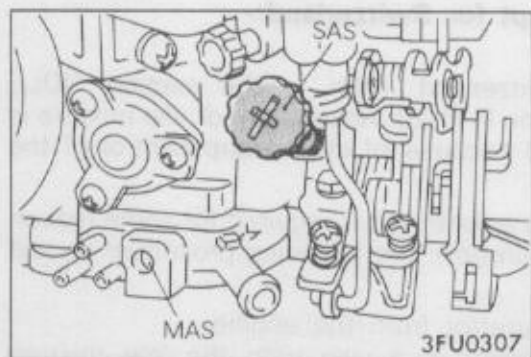


12. Disconnect the connector of the oxygen sensor.
13. Start and run the engine at least 5 minutes.
14. Connect the positive terminal of an analogue type voltmeter to the negative terminal of the feedback solenoid valve (FBSV) while connecting the negative terminal of the voltmeter to the vehicle body as the earth.

Caution

The feedback solenoid valve connector must not be disconnected.

15. Read and record the voltage value ("V-value"), at curb idle speed.
16. Reconnect the connector of the oxygen sensor.
17. Run the engine for about 10 seconds at an engine speed of 2,000 to 3,000 r/min.



18. Check the pointer travel of the voltmeter.
If the centre of the pointer travel is within the "V-value" ± 0.5 volt, then proceed to step 19.
If the centre of the pointer travel is out of the "V-value" ± 0.5 volt, adjust the mixture adjusting screw (MAS) so that the pointer swings centering on the "V-value" when idling. After adjustment, repeat above steps 17 and 18 for reconfirmation.

NOTE

If necessary, make an adjustment of the idling speed by using the idling speed adjustment screw (SAS).

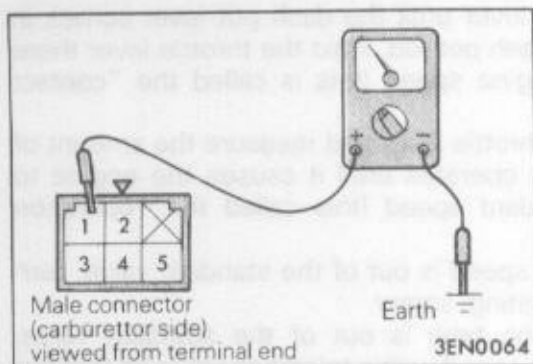
19. While the engine is idling, suddenly race it by opening the throttle valve fully until the engine speed reaches approx. 3,000 r/min., then close the throttle valve.
Make sure that when the engine is raced, the pointer of the voltmeter travels away from the idle state and that as the engine is returned to idle speed, the voltmeter pointer returns to the idle state.
20. Install the concealment plug into the hole to seal the mixture adjusting screws (MAS).

IDLE FEEDBACK CHECK <Vehicles for Switzerland>

E11FXBG

In case an idle condition check is required for some reason (except when overhauling carburettor), the following procedure should be followed.

1. Perform the inspection with the vehicle in the following condition.
 - Engine coolant temperature: 80 – 90°C (176 – 194°F)
 - Lamps and all accessories: OFF
 - Transmission: Neutral
 - Steering wheel: Straight forward position (Vehicles with power steering)



2. Connect the positive terminal of an analogue type voltmeter to the negative terminal of feedback solenoid valve while connecting the negative terminal of the voltmeter to the vehicle body as the earth.
3. Run the engine for about 10 seconds at an engine speed of 2,000 to 3,000 r/min.
4. Immediately after running the engine at high speed (above item 3), check the pointer travel of the voltmeter while the engine is running at idle.
In case the pointer of voltmeter has a swinging motion, and the centre of the pointer travel is between 2 and 12 volts, the system is in correct working condition.
5. In case the pointer has no swinging motion or the centre of the needle travel is out of specification (2 volts), check each part of the fuel system.
 - (a) If a certain part is found to be malfunctioning, repair or replace the part and repeat steps 3 and 4 for reconfirmation.
 - (b) If no part is found to be malfunctioning, clean the jets of the carburettor and repeat steps 3 and 4 for reconfirmation.
6. If the system is not working correctly after performing the above repair or replacement or cleaning, replace the throttle body of carburettor and repeat steps 3 and 4 for reconfirmation.
7. If the system is not working correctly even after replacing the throttle body, replace the carburettor assembly.

DASH POT INSPECTION AND ADJUSTMENT E11FYAH

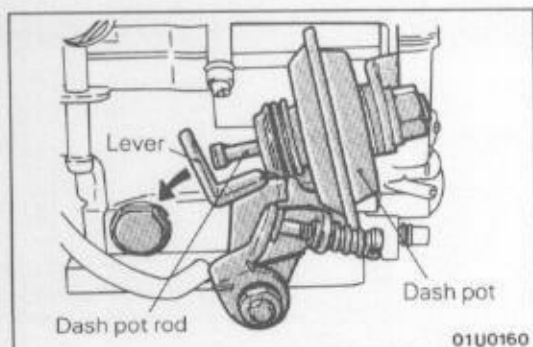
CONVENTIONAL CARBURETTOR

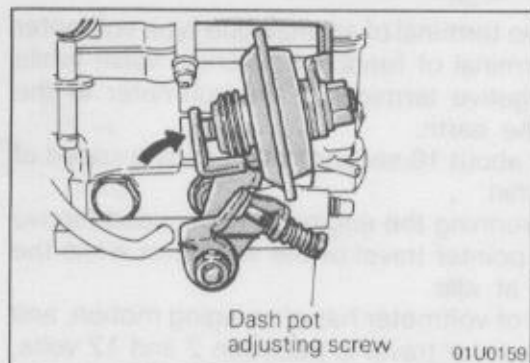
<All vehicles except for Australia>

NOTE

Check that the idle speed and the idle mixture are at the specified values.

1. Perform inspection and adjustment with the vehicle in the following condition.
 - Engine coolant temperature: 80 – 90°C (176 – 194°F)
 - Lamps and all accessories: OFF
 - Transmission: Neutral (N or P range on vehicles with A/T)
 - Steering wheel: Straight forward position (Vehicles with power steering)
2. Set up a tachometer.
3. Start the engine and run it at idle.
4. Open the throttle lever until the dash pot rod makes a full stroke.





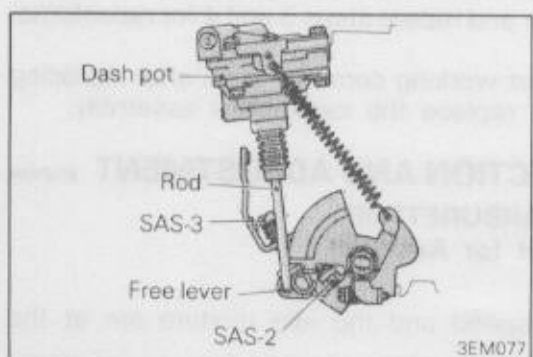
5. Close the throttle lever until the dash pot lever comes in contact with the dash pot rod. Hold the throttle lever there and check the engine speed (this is called the "contact speed").

Then release the throttle lever and measure the amount of time the dash pot operates until it causes the engine to return to its standard speed (this called the "operation time").

When the contact speed is out of the standard value, turn the dash pot adjusting screw.

When the operation time is out of the standard value, change the contact speed within tolerance value so that the operation time conforms to the standard value.

	Contact speed (r/min.)	Standard speed (r/min.)	Operation time (second)
M/T	1,600 – 2,000	900	3.5 – 6.5
A/T	1,300 – 1,700	1,000	1.5 – 4.5



FBC

NOTE

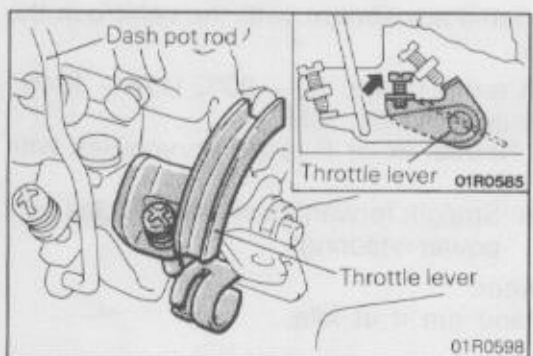
Curb idle speed must be properly adjusted before inspecting the dash pot.

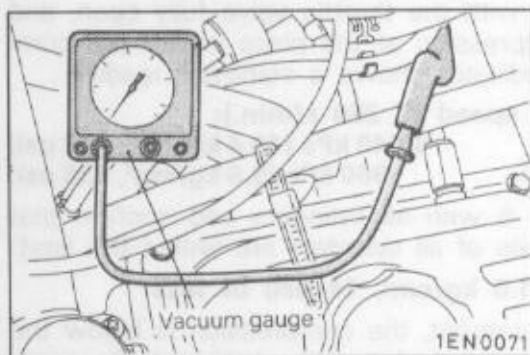
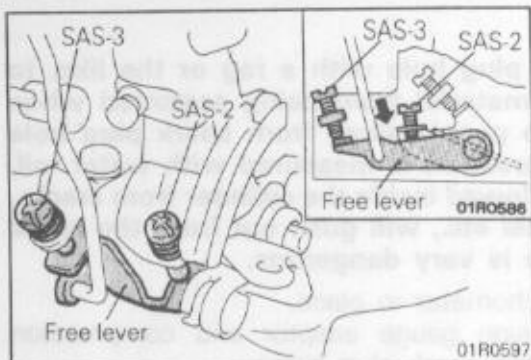
1. Perform inspection and adjustment with the vehicle in the following condition.

- Engine coolant temperature: 80 – 90°C (176 – 194°F)
- Lamps and all accessories: OFF
- Transmission: Neutral
- Steering wheel: Straight forward position (Vehicles with power steering)

2. Start the engine and run it at idle.

3. Open the throttle lever until the rod makes a full stroke (free lever touches SAS-3).





4. Close the throttle lever until the SAS-2 touches the free lever. Check the engine speed.

Standard value (engine speed when dash pot begins to operate): About 2,300 r/min.

5. If the engine speed deviates greatly from the standard value, adjust the dash pot r/min. by turning SAS-3.
6. Release the free lever and verify that engine returns to idle speed slowly.
7. If the engine speed has been adjusted, paint the SAS-3 (for vehicles for Switzerland).

MANIFOLD VACUUM INSPECTION

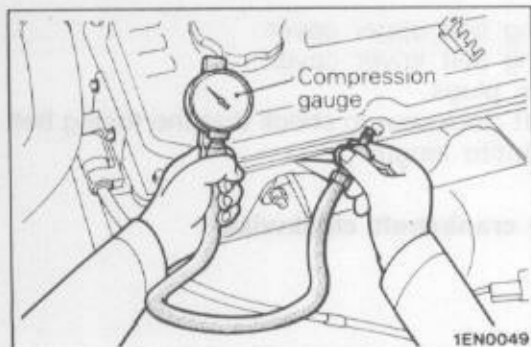
E11FWAI

1. Start the engine and allow it to warm up until the temperature of the engine coolant reaches 80 to 90°C (176 to 194°F).
2. Connect a tachometer.
3. Pull on and remove the ventilation hose from the positive crankcase ventilation valve, and connect a vacuum gauge to the disconnected end of the hose.
4. Start the engine and check that idle speed is within the standard value range. Read off the vacuum gauge.

Standard value: 70 kPa (0.7 kg/cm², 10 psi) or more

5. If not at standard value, refer to the following chart to locate the cause and make repairs.

Symptom	Probable cause	Remedy
Vacuum gauge reads under standard value but needle is stable.	• Delayed ignition timing. • Low valve clearance.	• Adjust ignition timing. • Adjust valve clearance.
Vacuum gauge needle fluctuates slowly.	• Air mixture concentration too high.	• Adjust carburettor.
Vacuum gauge reading decreases irregularly.	• Air mixture concentration too low.	• Adjust carburettor.
Vacuum gauge needle decreases about 4.0 – 21.3 kPa (0.04 – 0.22 kg/cm ² , 0.6 – 3.1 psi) intermittently.	• Poor contact of intake and exhaust valves with their seats.	• Check and repair valve.
Vacuum gauge needle suddenly decreases about 33.3 kPa (0.34 kg/cm ² , 4.8 psi) from standard value and then returns.	• Defective cylinder head gasket.	• Replace the cylinder head gasket.



COMPRESSION PRESSURE INSPECTION

E11FGBD

1. Check to be sure that the engine oil, starting motor and battery are in normal condition.
2. Start the engine and allow it to warm up until the temperature of the engine coolant reaches 80 to 90°C (176 to 194°F).
3. Disconnect the spark plug cable.
4. Remove all 4 spark plugs.
5. Crank the engine to discharge foreign material from the cylinder.

Caution

Cover the spark plug hole with a rag or the like, to prevent foreign material from being scattered when discharged. Keep people away from spark plug hole side. If the compression is measured with water, oil, fuel etc., having flowed inside the cylinder from cracks, hot water, oil, fuel etc., will gush out from the spark plug hole, which is very dangerous.

6. Set an engine tachometer in place.
7. Place a compression gauge adaptor and compression gauge in one of the spark plug holes.
8. Crank the engine with the throttle valve fully open, and measure the compression at the place where the compression gauge indicator shows a stabilized reading.

Limit (at engine speed of 250 r/min.):

<4G13> 1,040 kPa (10.4 kg/cm², 148 psi)

<4G15, 4G16> 960 kPa (9.6 kg/cm², 136 psi)

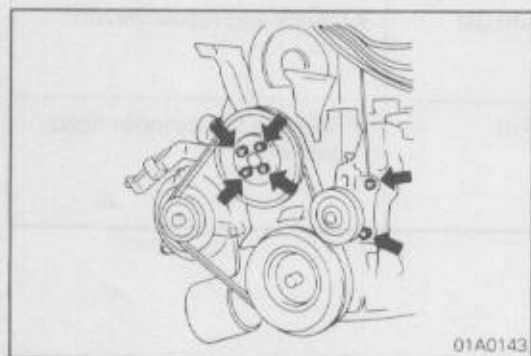
9. Conduct steps 7, 8 with all cylinders and confirm that pressure differences of all cylinders are within the limit.

Limit: 100 kPa (1.0 kg/cm², 14 psi) or less

10. If after the measurement, the compression is below the limit, put a small amount of engine oil through the spark plug hole into the cylinder; then measure the compression once again and determine the cause of the malfunction.
11. If, after oil is added, the compression rises, the cause of the malfunction is a worn or damaged piston ring and/or cylinder inner surface.

If, however, the compression does not rise, the cause is a bad valve or a bad gasket.

For information regarding the servicing procedures for these causes of malfunction, refer to the ENGINE AND TRANSMISSION MANUAL.



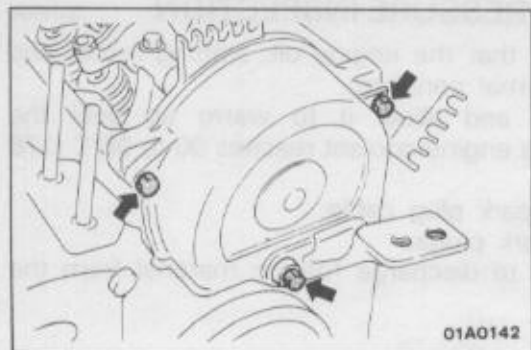
01A0143

TIMING BELT TENSION ADJUSTMENT

E11FFAP

The timing belt has an automatic tension adjusting mechanism. Adjustment can be made by the following procedure:

1. Remove the water pump pulley.
2. Remove the air conditioner pulley bracket.

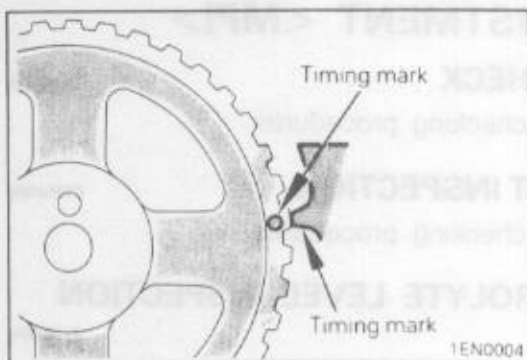


01A0142

3. Remove the timing belt upper cover.
4. Remove the timing belt lower cover.
5. Remove the spark plugs.
6. Turn the crankshaft clockwise to check that the timing belt is okay over its entire length.

Caution

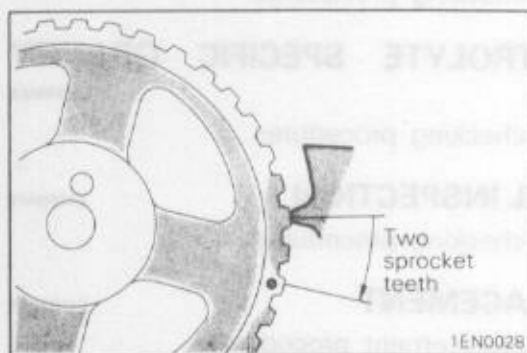
Always turn the crankshaft clockwise.



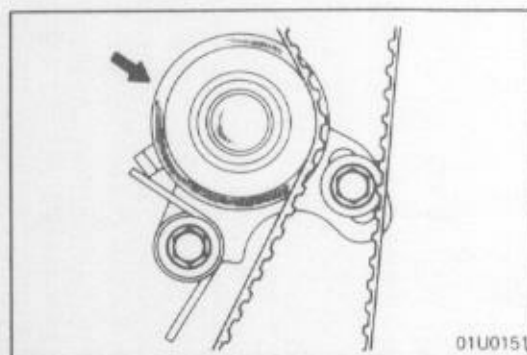
7. Turn the crankshaft clockwise to bring the No. 1 cylinder piston to the top dead centre on the compression stroke.

Caution

For aligning the timing marks, never turn the crankshaft counterclockwise as it could cause inadequate belt tensioning.

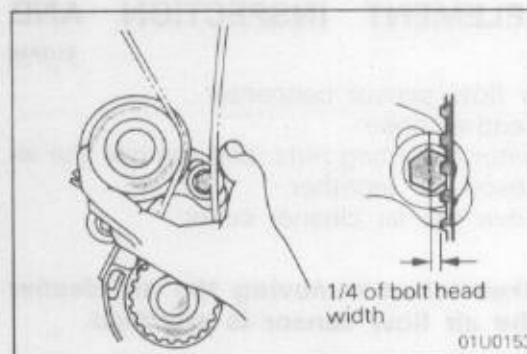


8. Loosen both pivot side and slot side tensioner bolts and tension the belt, making use of the tensioner spring force.
9. Turn the crankshaft clockwise by two sprocket teeth (18°).



10. Push the timing belt tensioner in the direction of the arrow to check that each sprocket is kept in firm and complete engagement with the belt cogs.

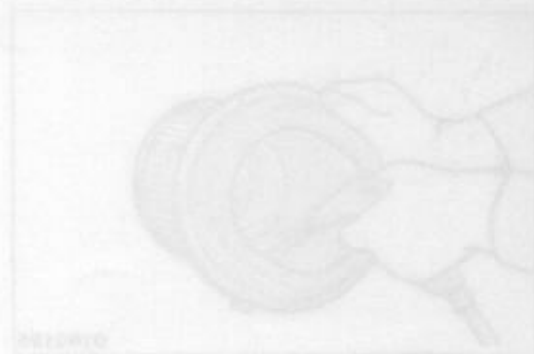
After this check, release hand pressure so that only the tensioner spring acts on belt and tighten the slot side bolt and then the pivot side bolt to fix the tensioner in position.



11. Check the timing belt tension.

Hold the timing belt tensioner and timing belt together by hand and give the belt a slight thumb pressure at a point level with tensioner centre. Make sure that the belt cog crest deflects approximately 1/4 of the tensioner attaching bolt head width.

12. Install the spark plugs.
13. Install the timing belt lower cover.
14. Install the timing belt upper cover.
15. Install the air conditioner pulley bracket.
16. Install the water pump pulley and adjust the drive belt deflection.



ENGINE ADJUSTMENT <MPI>**RADIATOR CAP CHECK**

E11FIAD0

Refer to P.11-11 for checking procedures.

ENGINE COOLANT INSPECTION

E11FJAE0

Refer to P.11-11 for checking procedures.

BATTERY ELECTROLYTE LEVEL INSPECTION

E11FLAF0

Refer to P.11-11 for checking procedures.

BATTERY ELECTROLYTE SPECIFIC GRAVITY CHECK

E11FMAC0

Refer to P.11-11 for checking procedures.

ENGINE OIL LEVEL INSPECTION

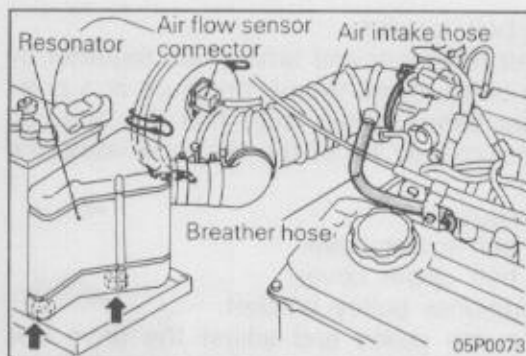
E11FNAF0

Refer to P.11-12 for checking procedures.

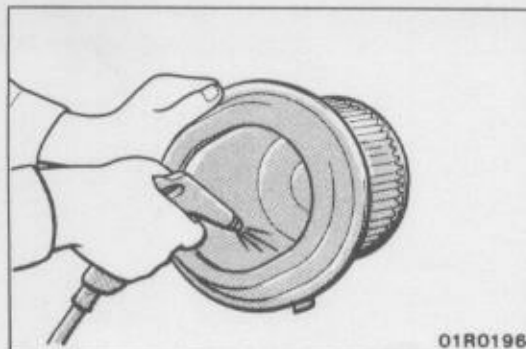
ENGINE OIL REPLACEMENT

E11FOAG0

Refer to P.11-12 for replacement procedures.



05P0073



01R0196

AIR CLEANER ELEMENT INSPECTION AND CLEANING

E11FPAK

1. Disconnect the air flow sensor connector.
2. Disconnect the breather hose.
3. Remove the resonator mounting nuts, and remove the air intake hose and resonator together.
4. Unclamp and remove the air cleaner cover.

Caution

Care must be taken when removing the air cleaner cover, because the air flow sensor is attached.

5. Take out the air cleaner element.
6. Check the air cleaner element for dirt or clogging; if necessary, clean by using compressed air.
7. Replace the air cleaner element if the dirt or clogging is serious.
8. Insert the element into the air cleaner body and install the air cleaner cover.
9. Install the air intake hose and resonator.
10. Connect the breather hose.
11. Connect the air flow sensor connector.

SPARK PLUG CHECK AND CLEANING

E11FRAG0

Refer to P.11-13 for information concerning checking, cleaning and replacement procedures.

Standard value:**Vehicles for Europe and Australia**

1.0 – 1.1 mm (0.039 – 0.043 in.)

Vehicles for General Export

0.7 – 0.8 mm (0.028 – 0.031 in.)

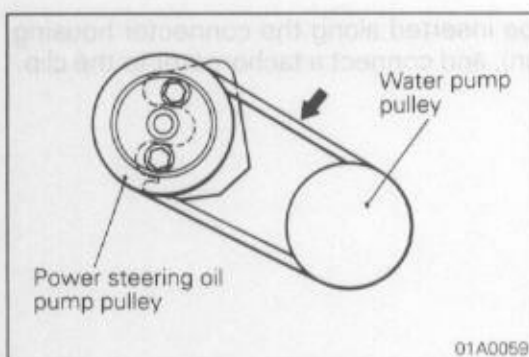
DRIVE BELT TENSION INSPECTION

E11FQAM

Refer to P.11-14 for checking procedures.

ALTERNATOR DRIVE BELT TENSION ADJUSTMENT

Refer to P.11-14 for adjusting procedures.

**POWER STEERING OIL PUMP DRIVE BELT TENSION ADJUSTMENT**

- (1) Loosen power steering oil pump fixing bolt.
- (2) Move power steering oil pump, tension belt moderately and adjust tension.

Vehicles built from June 1992**Standard value:**

If used belt (with correct tension) is used;

5.5 – 7.5 mm (0.22 – 0.30 in.)

If a new belt is used; 4.0 – 5.5 mm (0.16 – 0.22 in.)

- (3) Tighten fixing bolt.

Tightening torque: 40 Nm (4.0 kgm, 29 ft.lbs.)

- (4) Check belt tension and adjust if necessary.

AIR CONDITIONER COMPRESSOR DRIVE BELT TENSION ADJUSTMENT

Refer to P.11-15 for adjusting procedures.

VALVE CLEARANCE INSPECTION AND ADJUSTMENT

E11FDBT

Refer to P.11-15 for checking and adjustment procedures.

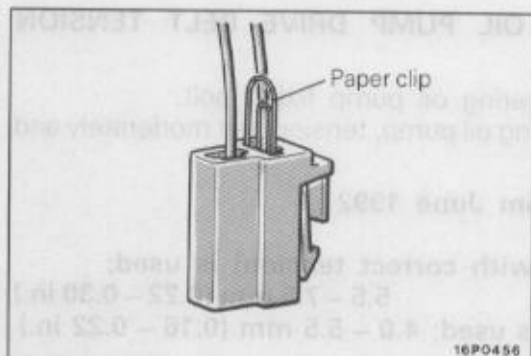
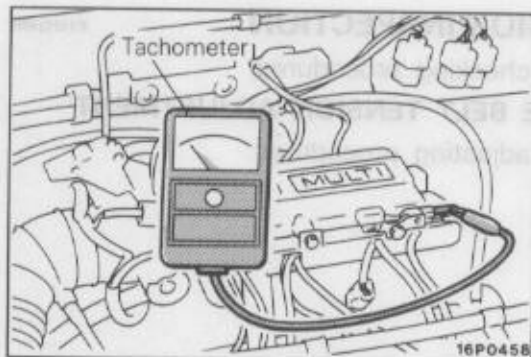
IGNITION TIMING INSPECTION AND ADJUSTMENT

E11FUAK

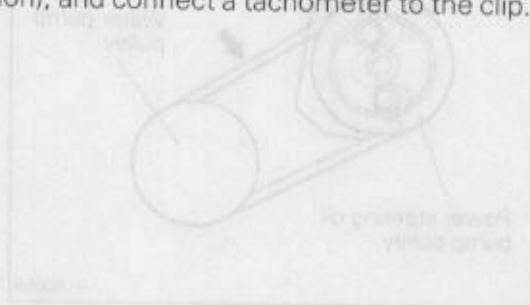
1. Perform inspection and adjustment with the vehicle in the following condition.

- Engine coolant temperature: 80 – 90°C (176 – 194°F)
- Lamps, electric cooling fan and all accessories: OFF
- Transmission: Neutral (P range on vehicles with A/T)
- Steering wheel: Straight forward position (Vehicles with power steering)

2. Connect a tachometer.



The paper clip should be inserted along the connector housing (shown in the illustration), and connect a tachometer to the clip.



NOTES

3. Set up the timing light.
4. Check that the engine speed is approx. 800/min.
5. Turn the ignition switch to OFF.
6. Remove the waterproof connector from the ignition timing adjustment connector.
7. Connect the jumper wire with the clip to the ignition timing adjustment terminal and earth this to the body (see illustration at left).
8. Start the engine and run it at curb idle speed.



9. Check that the basic ignition timing is within the standard value.

Standard value: $8^{\circ}\text{BTDC} \pm 1^{\circ}$



10. If the timing is not within the standard value range, loosen the distributor mounting nut and adjust by rotating the distributor body.

NOTE

- (1) Vehicles built up to May 1990:
Turning distributor body clockwise retards the ignition timing, turning it counterclockwise advances the ignition timing.



- (2) Vehicles built from June 1990:
Turning the distributor body clockwise advances the ignition timing, turning it counterclockwise retards the ignition timing.



11. Tighten the mounting nut after adjustment.
12. Turn the ignition switch to OFF, then disconnect the jumper wire from the ignition timing adjustment connector and return it to its original condition.
13. Check that the ignition timing is as specified.

Standard value: Approx. 10°BTDC

NOTE

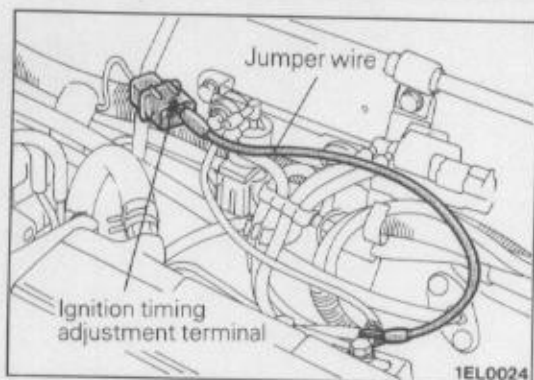
- (1) The ignition timing may vary within about $\pm 1^{\circ}$ and this is normal.
- (2) At elevated speeds, the timing is further advanced by about 5° from 10°BTDC .

14. Sealing tape is to be attached to the timing nut only for vehicles for Switzerland.

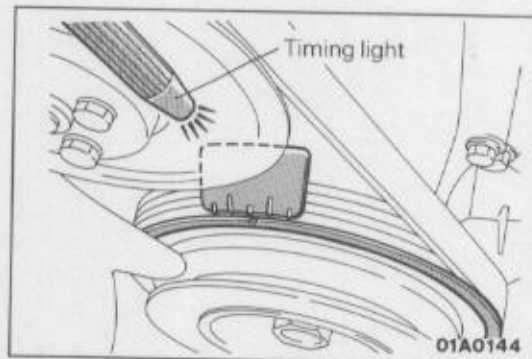
NOTE

- Sealing tape has been attached at the factory for all other vehicles for Europe.



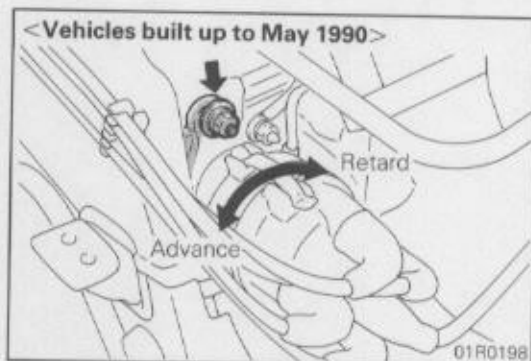


3. Set up the timing light.
4. Check that the engine speed is approx. 800 r/min.
5. Turn the ignition switch to OFF.
6. Remove the waterproof connector from the ignition timing adjustment connector.
7. Connect the jumper wire with the clip to the ignition timing adjustment terminal, and earth this to the body (see illustration at left).
8. Start the engine and run it at curb idle speed.



9. Check that the basic ignition timing is within the standard value.

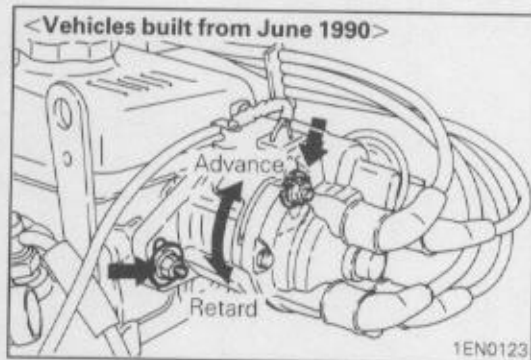
Standard value: 5°BTDC ± 2°



10. If the timing is not within the standard value range, loosen the distributor mounting nut and adjust by rotating the distributor body.

NOTE

- (1) Vehicles built up to May 1990:
Turning distributor body clockwise retards the ignition timing; turning it counterclockwise advances the ignition timing.



- (2) Vehicles built from June 1990:
Turning the distributor body clockwise advances the ignition timing; turning it counterclockwise retards the ignition timing.

11. Tighten the mounting nut after adjustment.
12. Turn the ignition switch to OFF; then disconnect the jumper wire from the ignition timing adjustment connector and return it to its original condition.
13. Check that the ignition timing is as specified.

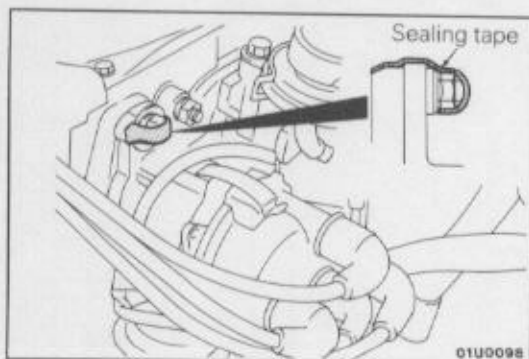
Standard value: Approx. 10°BTDC

NOTE

- (1) The ignition timing may vary within about ± 7° and this is normal.
 - (2) At elevated places, the timing is further advanced by about 5° from 10°BTDC.
14. Sealing tape is to be attached to the fitting nut only for vehicles for Switzerland.

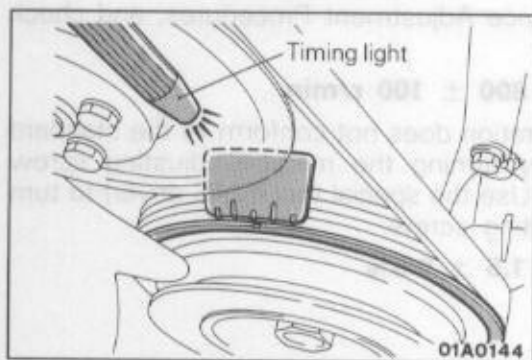
NOTE

Sealing tape has been attached at the factory for all other vehicles for Europe.



ENGINE IDLING SPEED INSPECTION <Vehicles for Europe and Australia>

E11FXAX



1. Perform inspection and adjustment with the vehicle in the following condition.
 - Engine coolant temperature: 80 – 90°C (176 – 194°F)
 - Lamps, electric cooling fan and all accessories: OFF
 - Transmission: Neutral (P range on vehicles with A/T)
 - Steering wheel: Straight forward position
2. Install a tachometer. Alternatively, connect the multi-use tester to the diagnosis connector located next to the fuse box. (For the method of installing the tachometer, refer to P.11-27.)
3. Set up the timing light.
4. Ground the ignition timing adjustment terminal using the jumper wire. (Refer to P.11-28.)
5. Start the engine and run it at idle.
6. Check the ignition timing. Adjust if necessary. (Refer to P.11-27.)

Standard value: 5°BTDC ± 2°

7. Unground the ignition timing adjustment terminal.
8. Run the engine at idle for 2 minutes.
9. Check the idle speed. When the multi-use tester is used, enter code No. 22 by pressing the key and read the idle speed on the display.

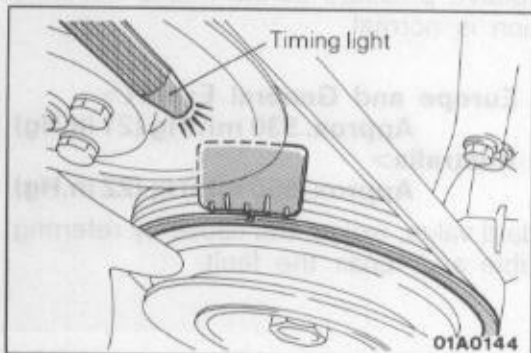
Curb idle speed:**Vehicles for Europe:****<4G13 Engine> 750 ± 100 r/min.****<4G15 Engine> 800 ± 100 r/min.****Vehicles built up to May 1990 for Australia:****700 ± 100 r/min.****Vehicles built from June 1990 for Australia:****750 ± 100 r/min.****NOTE**

The idle speed is adjusted automatically by the idle speed control (ISC) system.

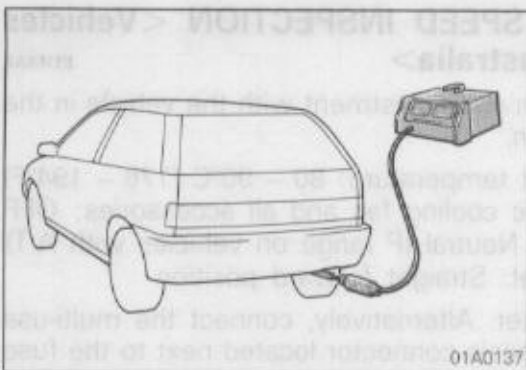
10. If there is a deviation from the standard value, refer to GROUP 13 – Check Chart Classified by Problem Symptoms, and check the MPI components.

ENGINE IDLING SPEED AND IDLE MIXTURE INSPECTION AND ADJUSTMENT <Vehicles for General Export>

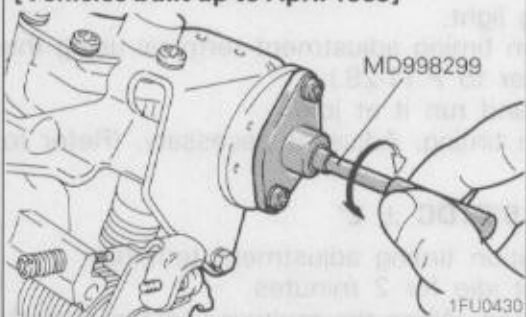
E11FXBH



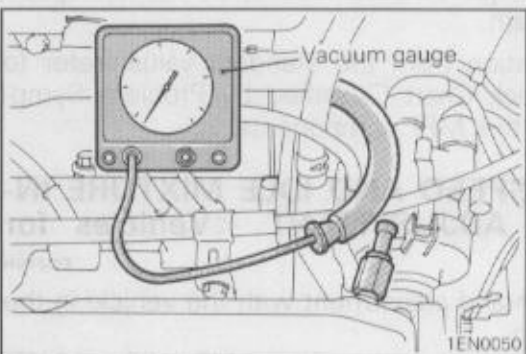
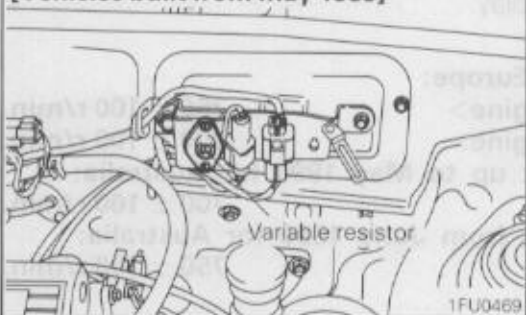
1. Perform inspection and adjustment with the vehicle in the following condition.
 - Engine coolant temperature: 80 – 90°C (176 – 194°F)
 - Lamps and all accessories: OFF
 - Transmission: Neutral (N or P range on vehicles with A/T)
 - Steering wheel: Straight forward position
2. Install a tachometer. Alternatively, connect the multi-use tester to the diagnosis connector located next to the fuse box. (For the method of installing the tachometer, refer to P.11-27.)
3. Set up the timing light.
4. Start the engine and run it at idle.



[Vehicles built up to April 1989]



[Vehicles built from May 1989]



5. Check the ignition timing. Adjust if necessary. (Refer to P.11-27.)

Standard value: $5^{\circ}\text{BTDC} \pm 2^{\circ}$

6. Set up the CO tester.
7. Run the engine for more than 5 seconds at an engine speed of 2,000 to 3,000 r/min.
8. Run the engine at idle for 2 minutes.
9. Check the idle speed. When the multi-use tester is used, enter code No. 22 by pressing the key and read the idle speed on the display.

If there is a deviation from the standard value, refer to GROUP 13 – Service Adjustment Procedures, and check the MPI system.

Standard value: 800 ± 100 r/min.

10. If the CO concentration does not conform to the standard value, adjust it by turning the mixture adjusting screw (variable resistor). Use the special tool (MAS driver) to turn the mixture adjusting screw.

Standard value: $1.5 \pm 0.5\%$

MANIFOLD VACUUM INSPECTION

E11FWAJ

- (1) Perform inspection and adjustment with the vehicle in the following condition.
 - Engine coolant temperature: $80 - 90^{\circ}\text{C}$ ($176 - 194^{\circ}\text{F}$)
 - Lamps, electric cooling fan, and accessories: OFF
 - Transmission: Neutral (N or P for A/T)
 - Steering wheel: Neutral position
- (2) Check that the idling revolution speed is normal.
- (3) Remove the PCV hose from the PCV valve and attach a vacuum gauge.
- (4) Check that the negative pressure at the intake manifold during idle revolution is normal.

Standard value:

<Vehicles for Europe and General Export>

Approx. 530 mmHg (21 in.Hg)

<Vehicles for Australia>

Approx. 550 mmHg (22 in.Hg)

- (5) If outside the standard value, isolate the cause by referring to the following table and repair the fault.

Symptom	Cause	Remedy
The vacuum gauge reading is less than the standard value, but the pointer is stable.	Ignition timing is retarded.	- Adjust the ignition timing. - Adjust the valve clearance.
The vacuum gauge pointer swings slowly.	The gas mixture is excessively rich.	Check ECI-MULTI system.
The vacuum gauge pointer drops irregularly.	The gas mixture is excessively lean.	Check ECI-MULTI system.
The vacuum gauge pointer drops intermittently to 4.0 – 21.3 kPa (0.04 – 0.22 kg/cm ² , 0.6 – 3.1 psi).	The valve is too tight.	Check and repair the valve.
The vacuum gauge pointer drops suddenly from the normal reading to 33.3 kPa (0.34 kg/cm ² , 4.8 psi), then returns to normal.	Defective of cylinder head gasket	Replace the cylinder head gasket.

COMPRESSION PRESSURE INSPECTION

E11FGBE0

Refer to P.11-23 for checking procedures.

Limit (at engine speed of 250 r/min.):**Compression pressure** 960 kPa (9.6 kg/cm², 136 psi)**Compression pressure difference between each cylinder** 100 kPa (1.0 kg/cm², 14 psi) or less**TIMING BELT TENSION ADJUSTMENT**

E11FFAQ

Refer to P.11-24 for adjustment procedures.

CAMSHAFT AND CAMSHAFT OIL SEAL

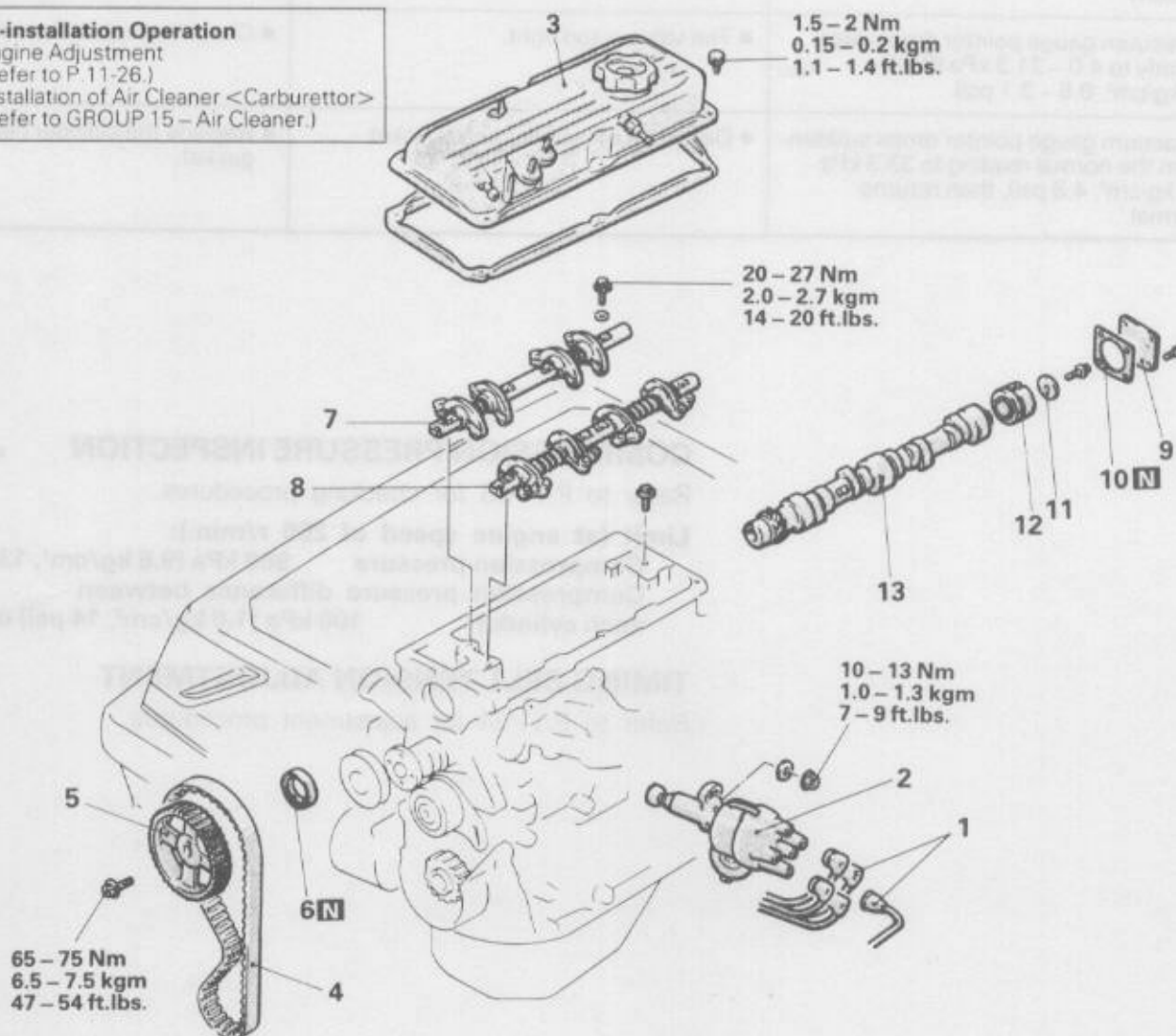
REMOVAL AND INSTALLATION

Pre-removal Operation

- Removal of Air Cleaner <Carburettor>
(Refer to GROUP 15 – Air Cleaner.)

Post-installation Operation

- Engine Adjustment
(Refer to P. 11-26.)
- Installation of Air Cleaner <Carburettor>
(Refer to GROUP 15 – Air Cleaner.)



01P0041

Removal steps

1. Spark plug cable and high tension cable
- ♦♦ 2. Distributor
- ♦♦ 3. Rocker cover
- ♦♦ ♦♦ 4. Timing belt
- ♦♦ 5. Camshaft sprocket
- ♦♦ 6. Oil seal
- ♦♦ ♦♦ 7. Rocker arm assembly
- ♦♦ ♦♦ 8. Rocker arm assembly
9. Rear cover
10. Rear cover gasket
11. Thrust plate
- ♦♦ 12. Camshaft thrust case
- ♦♦ 13. Camshaft

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ♦♦: Refer to "Service Points of Removal".
- (3) ♦♦: Refer to "Service Points of Installation".
- (4) N Non-reusable parts

SERVICE POINTS OF REMOVAL

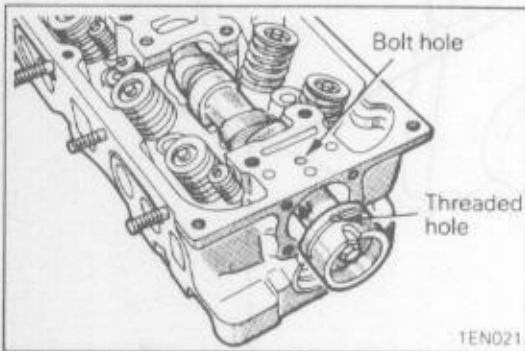
E11HBAD

4. REMOVAL OF TIMING BELT

Refer to P.11-46.

7. 8. REMOVAL OF ROCKER ARM ASSEMBLY

When removing the flange bolts, loosen little by little and uniformly.

**SERVICE POINTS OF INSTALLATION**

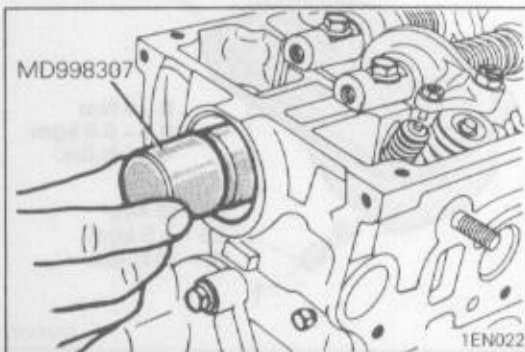
E11HCAD

13. INSTALLATION OF CAMSHAFT / 12. CAMSHAFT THRUST CASE

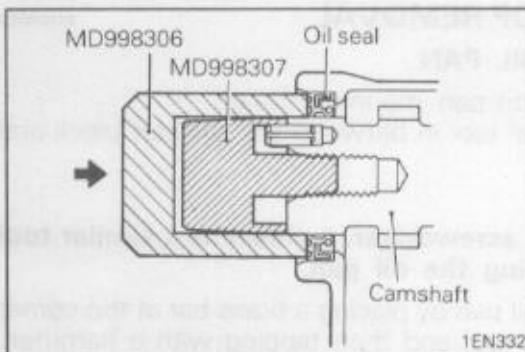
Insert the camshaft thrust case in cylinder head with the threaded hole facing up, and align the threaded hole with the bolt hole in the cylinder head. Install and firmly tighten the bolt.

8. 7. INSTALLATION OF ROCKER ARM ASSEMBLY

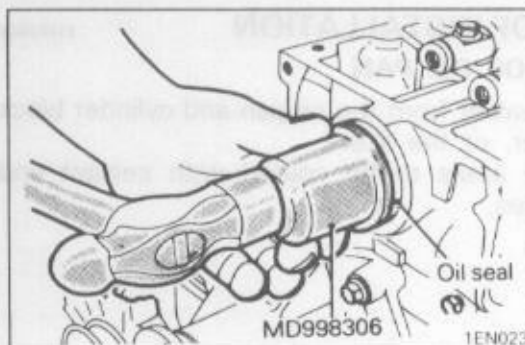
Tighten the rocker arm attaching bolts little by little and uniformly. Finally tighten to the specified torque.

**6. INSTALLATION OF OIL SEAL**

(1) Fit the special tool on the camshaft end and apply engine oil to the outside of the tool.



(2) Apply a light coat of engine oil to the oil seal lip and slide it along the tool inward.



(3) Drive the oil seal into cylinder head using the special tool and a hammer.

4. INSTALLATION OF TIMING BELT

Refer to P.11-46.

2. INSTALLATION OF DISTRIBUTOR

Refer to GROUP 16 – Ignition System.

OIL PAN

E11KA-A

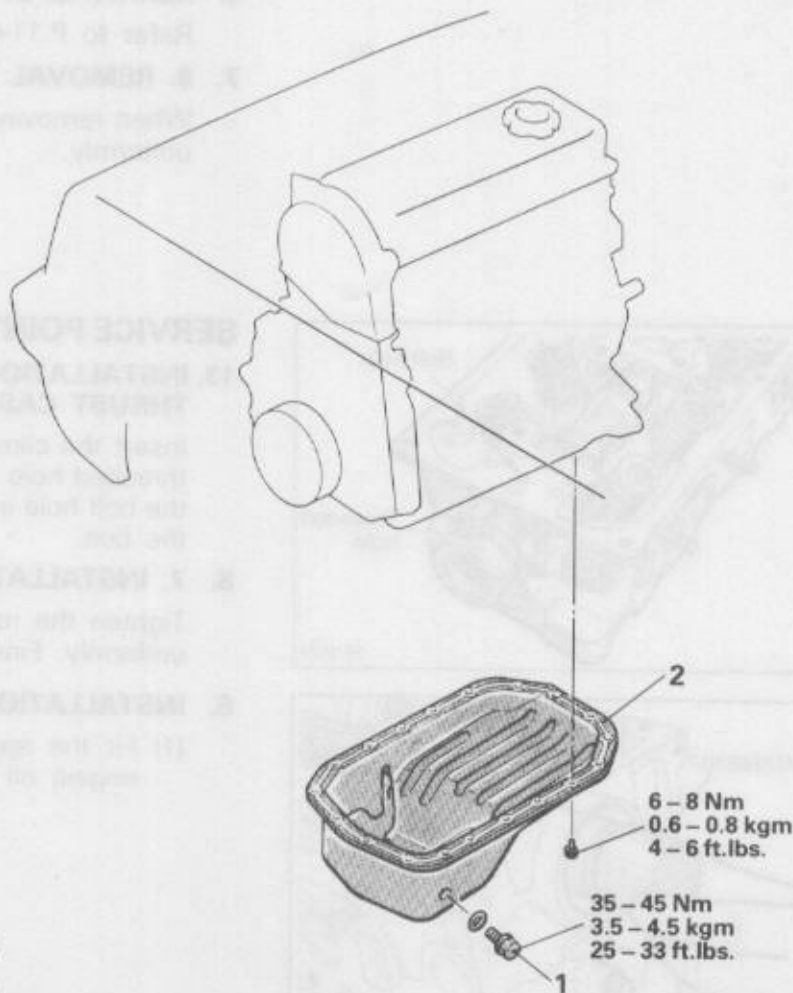
REMOVAL AND INSTALLATION

Pre-removal Operation

- Draining Engine Oil
(Refer to P.11-12.)

Post-installation Operation

- Refilling Engine Oil
(Refer to P.11-12.)

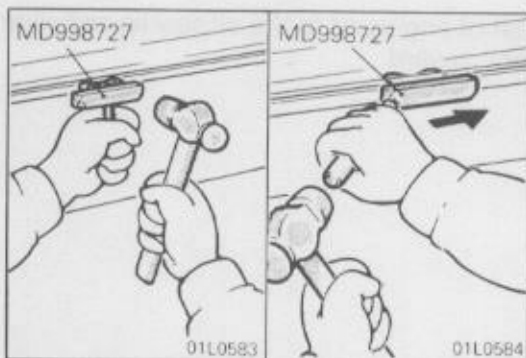
**Removal steps**

1. Drain plug
2. Oil pan

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆: Refer to "Service Points of Removal".
- (3) ◆◆: Refer to "Service Points of Installation".

01P0027

**SERVICE POINT OF REMOVAL**

E11KB8D0

2. REMOVAL OF OIL PAN

- (1) Remove the oil pan mounting bolts.
- (2) Tap the special tool in between the cylinder block and the oil pan.

Caution

Do not use a screwdriver, a chisel or a similar tool when removing the oil pan.

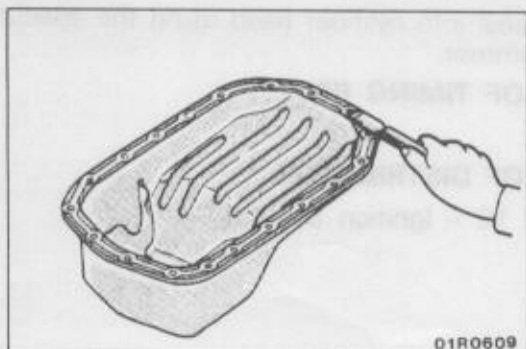
- (3) Remove the oil pan by placing a brass bar at the corner of the special tool and then tapping with a hammer.

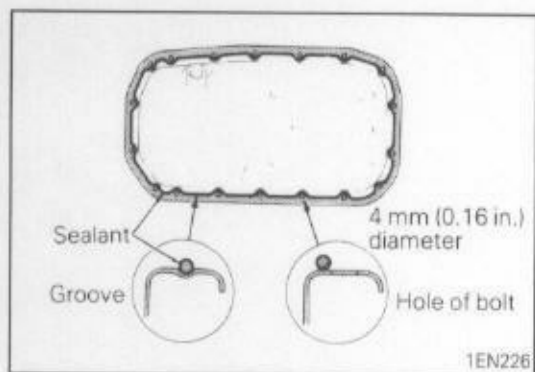
SERVICE POINT OF INSTALLATION

E11KB8D0

2. INSTALLATION OF OIL PAN

- (1) Remove all sealant from the oil pan and cylinder block with a scraper, or the like.
- (2) Degrease the areas to be coated with sealant and mating surfaces.

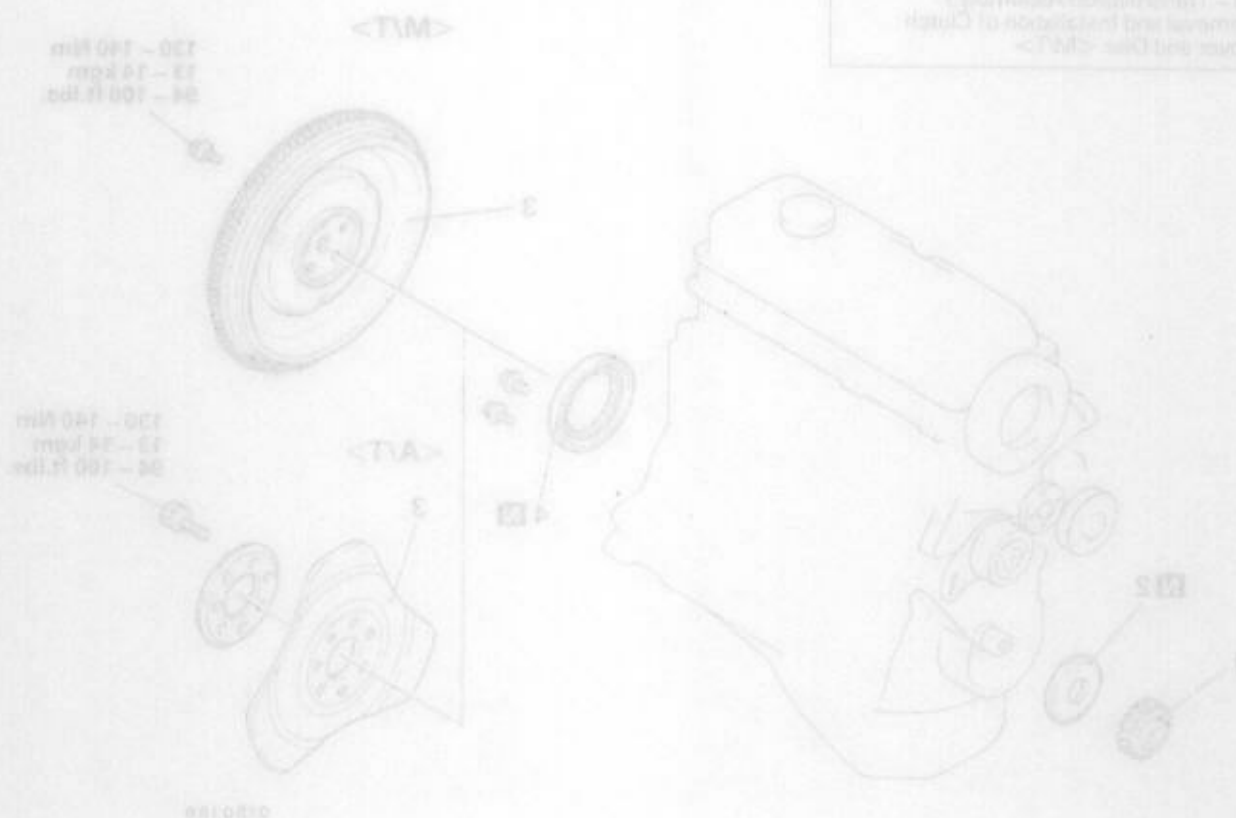




- (3) Apply the specified sealant around the surface of oil pan as specified in illustration.

**Specified sealant: MITSUBISHI GENUINE PART
No. MD970389 or equivalent**

- (4) Install the oil pan on the cylinder block within 15 minutes after applying the sealant.



CRANKSHAFT OIL SEAL

REMOVAL AND INSTALLATION

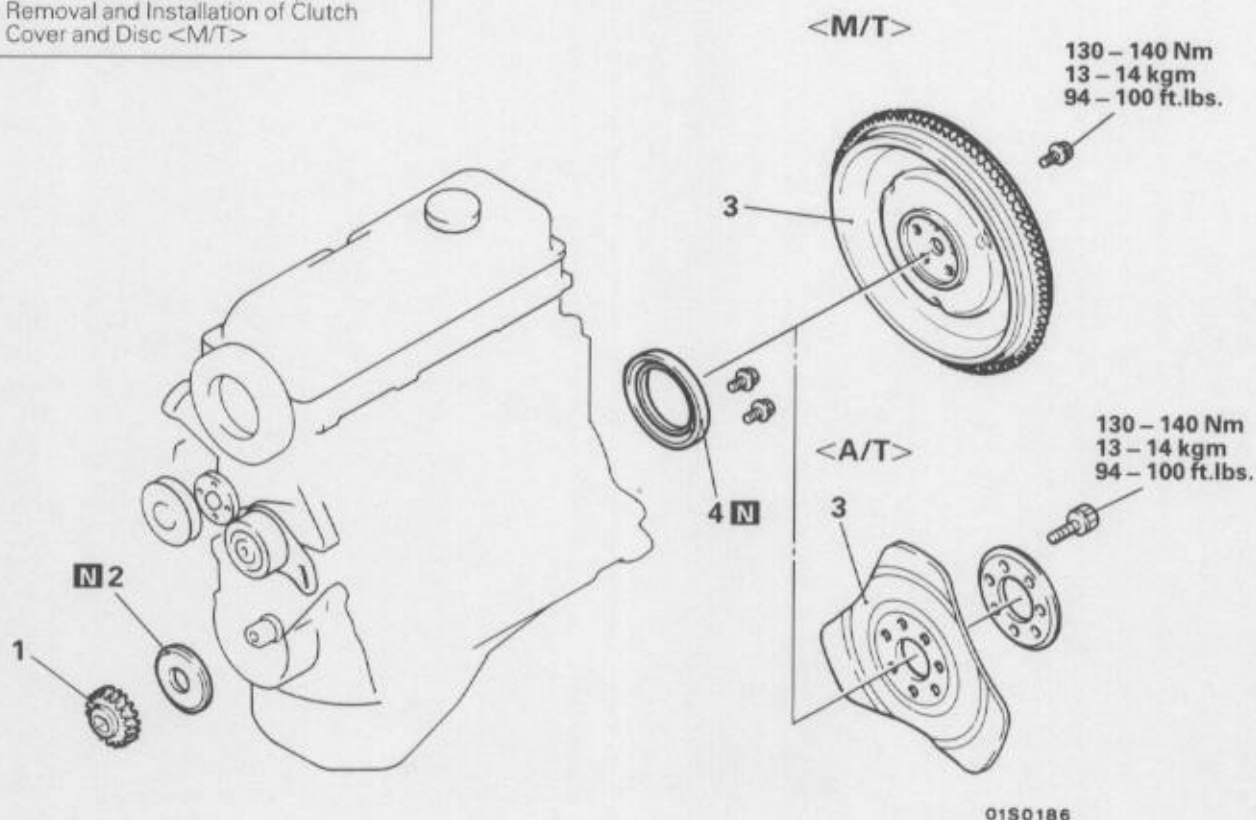
Pre-removal and Post-installation Operation

<Crankshaft Oil Seal>

- Removal and Installation of Timing Belt (Refer to P.11-46.)

<Crankshaft Rear Oil Seal>

- Removal and Installation of Oil Pan (Refer to P.11-34.)
- Removal and Installation of Transmission Assembly (Refer to GROUP 22 or 23 – Transmission Assembly.)
- Removal and Installation of Clutch Cover and Disc <M/T>



Removal steps of crankshaft front oil seal

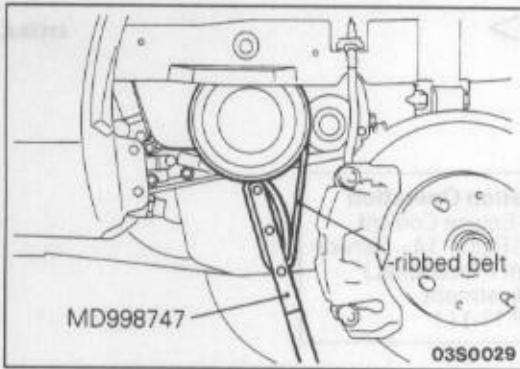
1. Crankshaft sprocket
- ♦♦ 2. Crankshaft front oil seal

Removal steps of crankshaft rear oil seal

- ♦♦ 3. Flywheel assembly <M/T> or drive plate <A/T>
- ♦♦ 4. Crankshaft rear oil seal

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ♦♦: Refer to "Service Points of Removal".
- (3) ♦♦: Refer to "Service Points of Installation".
- (4) **N**: Non-reusable parts



SERVICE POINT OF REMOVAL

E11UBAF

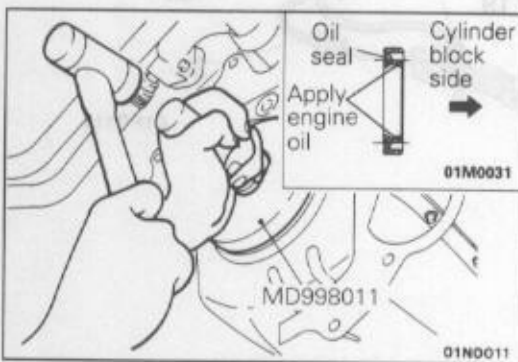
3. REMOVAL OF FLYWHEEL ASSEMBLY <M/T> OR DRIVE PLATE <A/T>

- (1) Fix the crank shaft pulley by using the V-ribbed belt and the special tool.

Caution

- (1) Because the V-ribbed belt installed in the vehicle may be damaged, use a disused V-ribbed belt.
- (2) Do not use a damaged V-ribbed belt.

- (2) Remove the flywheel assembly <M/T> or the drive plate <A/T>.

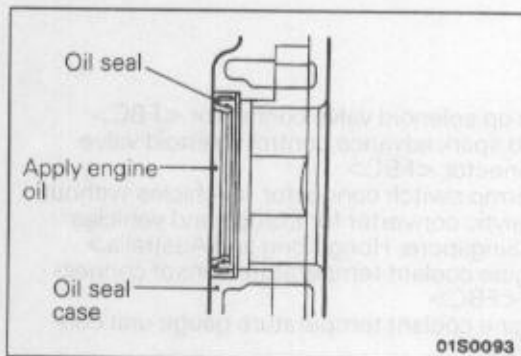


SERVICE POINTS OF INSTALLATION

E11UCAL

4. INSTALLATION OF CRANKSHAFT REAR OIL SEAL

- (1) Apply a small amount of engine oil to the entire circumference of the oil seal lip.
- (2) Tap the oil seal as shown in the illustration until it is flush with the oil seal case.



2. INSTALLATION OF CRANKSHAFT FRONT OIL SEAL

- (1) Apply a small amount of engine oil to the entire circumference of the oil seal lip.
- (2) Tap the oil seal until it is flush with the oil seal case.

CYLINDER HEAD GASKET <CARBURETTOR>

E11JA-A

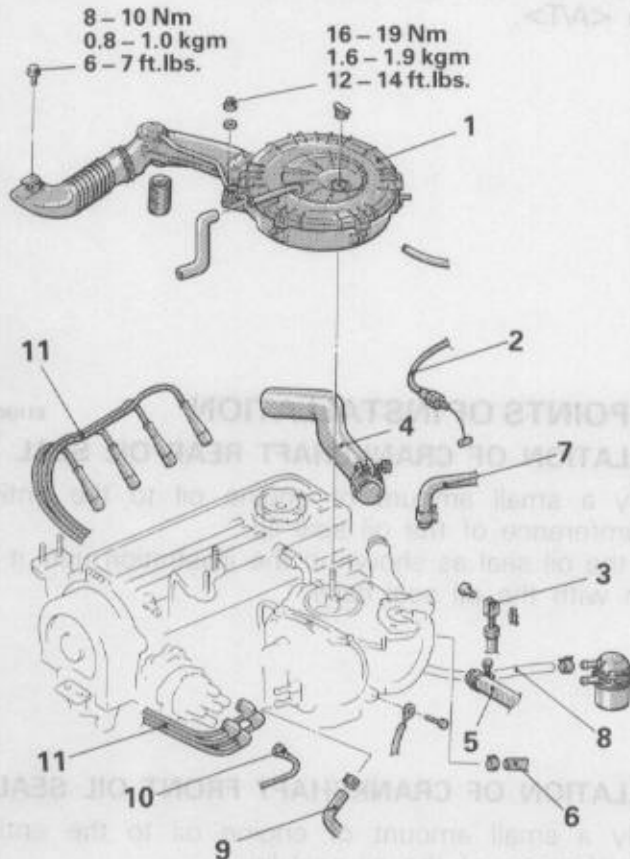
REMOVAL AND INSTALLATION

Pre-removal Operation

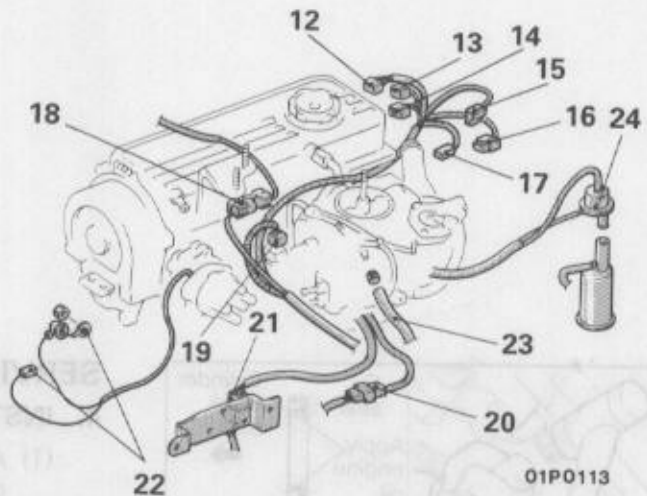
- Draining of Engine Coolant (Refer to GROUP 14 - Service Adjustment Procedures.)

Post-installation Operation

- Supplying Engine Coolant (Refer to GROUP 14 - Service Adjustment Procedures.)
- Engine Adjustment (Refer to P.11-11.)



01P0028

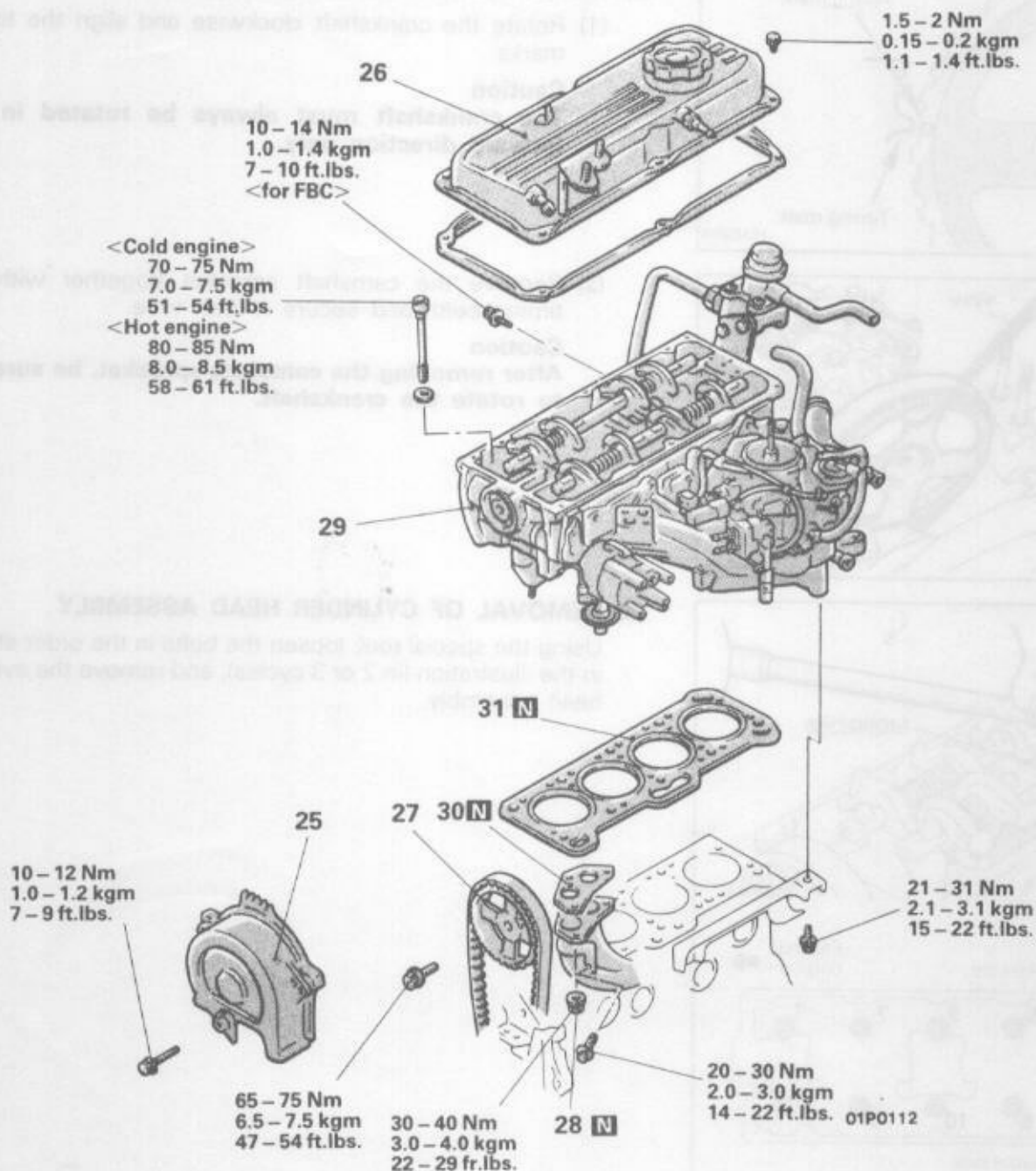


01P0113

Removal steps

1. Air cleaner
- ♦♦ 2. Connection for accelerator cable
- ♦♦ 3. Connection for throttle control cable <A/T>
4. Connection for radiator upper hose
5. Connection for heater hose
6. Connection for water bypass hose
7. Connection for brake booster vacuum hose
8. Connection for fuel main hose
9. Connection for fuel return hose
10. Connection for high tension cable <Vehicles built up to May 1990>
11. Spark plug cable
12. Secondary air solenoid valve connector <FBC>

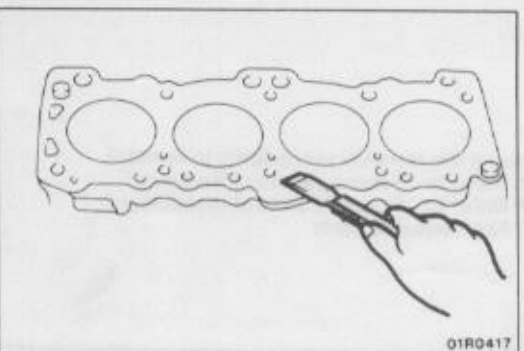
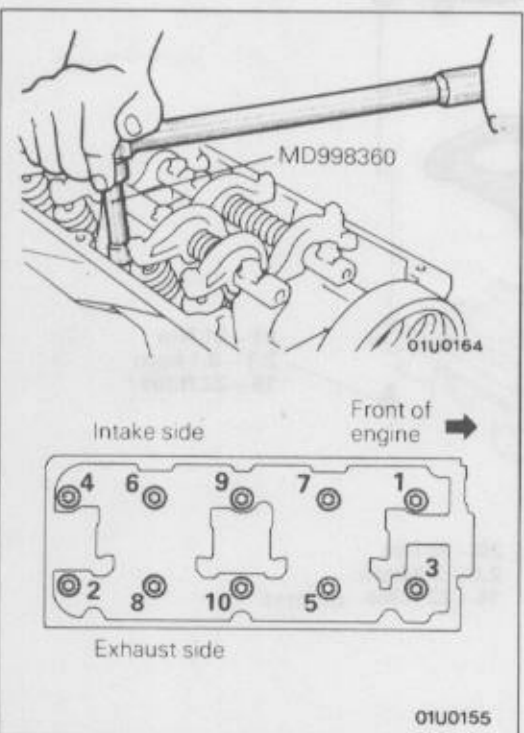
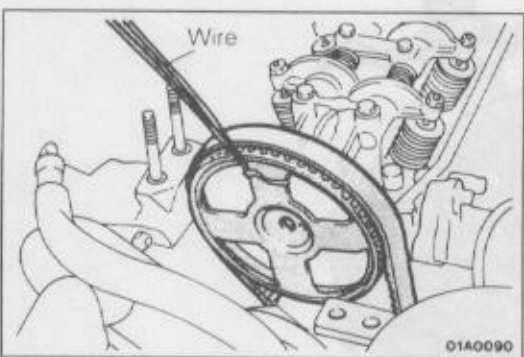
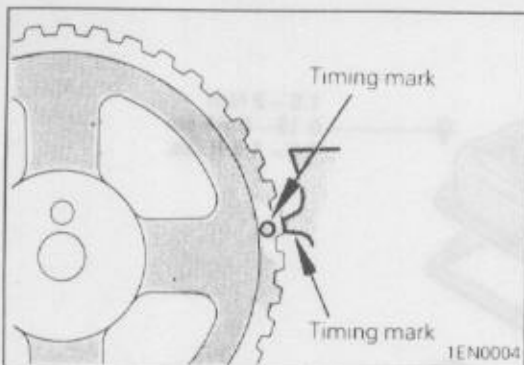
13. Idle up solenoid valve connector <FBC>
14. Cold spark advance control solenoid valve connector <FBC>
15. Thermo switch connector <Vehicles without catalytic converter for Europe and vehicles for Singapore, Hong Kong and Australia>
16. Engine coolant temperature sensor connector <FBC>
17. Engine coolant temperature gauge unit connector
18. Oxygen sensor connector <FBC>
19. Feedback solenoid valve connector <FBC>
20. Cold mixture heater connector <Vehicles for Europe, Singapore, Hong Kong and Australia>
21. Throttle position sensor connector <FBC>
22. Distributor connector <Vehicles built up to May 1990>
23. Connection for vacuum hose
24. Connection for purge control valve <FBC, vehicles for GCC and Australia>



- 25. Timing belt upper cover
- 26. Rocker cover
- ♦♦ 27. Camshaft sprocket
- ♦♦ ♦♦ 28. Self-locking nut
- ♦♦ ♦♦ 29. Cylinder head assembly
- ♦♦ 30. Gasket
- ♦♦ 31. Cylinder head gasket

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ♦♦: Refer to "Service Points of Removal".
- (3) ♦♦ ♦♦: Refer to "Service Points of Installation".
- (4) N: Non-reusable parts



SERVICE POINTS OF REMOVAL

E11JBAQ

27. REMOVAL OF CAMSHAFT SPROCKET

- (1) Rotate the crankshaft clockwise and align the timing marks.

Caution

The crankshaft must always be rotated in the forward direction only.

- (2) Remove the camshaft sprocket (together with the timing belt), and secure it with wire.

Caution

After removing the camshaft sprocket, be sure not to rotate the crankshaft.

29. REMOVAL OF CYLINDER HEAD ASSEMBLY

Using the special tool, loosen the bolts in the order shown in the illustration (in 2 or 3 cycles), and remove the cylinder head assembly.

SERVICE POINTS OF INSTALLATION

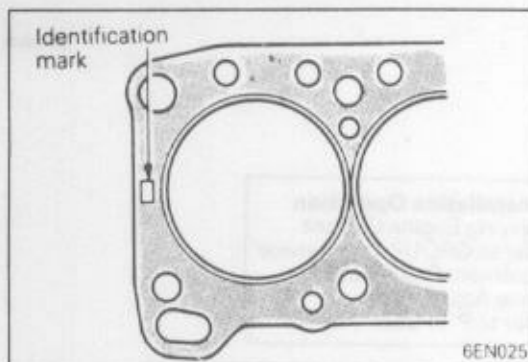
E11JDCE

31. INSTALLATION OF CYLINDER HEAD GASKET

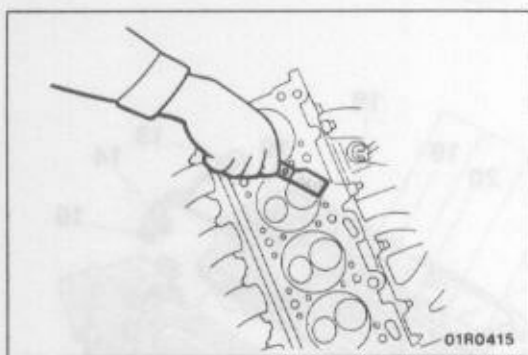
- (1) Use a scraper to remove the cylinder head gasket from the cylinder block.

Caution

Take care that no foreign material gets into the cylinder, or into the engine coolant or oil passages.



- (2) Place the cylinder head gasket on the cylinder block with the marks facing upward.

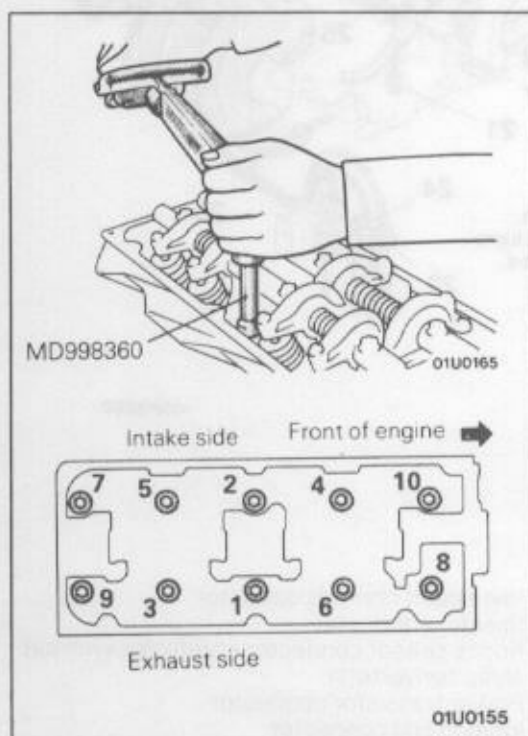


29. INSTALLATION OF CYLINDER HEAD ASSEMBLY

- (1) Use a scraper to remove the cylinder head gasket from the cylinder head assembly.

Caution

Take care that no foreign material gets into the engine coolant or oil passages.



- (2) Using the special tool, tighten the bolts in the order shown repeating the sequence once or twice.

3. ADJUSTMENT OF THROTTLE CONTROL CABLE <A/T>

Refer to GROUP 23 – Service Adjustment Procedures.

2. ADJUSTMENT OF ACCELERATOR CABLE

Refer to GROUP 13 – Service Adjustment Procedures.

CYLINDER HEAD GASKET <MPI>

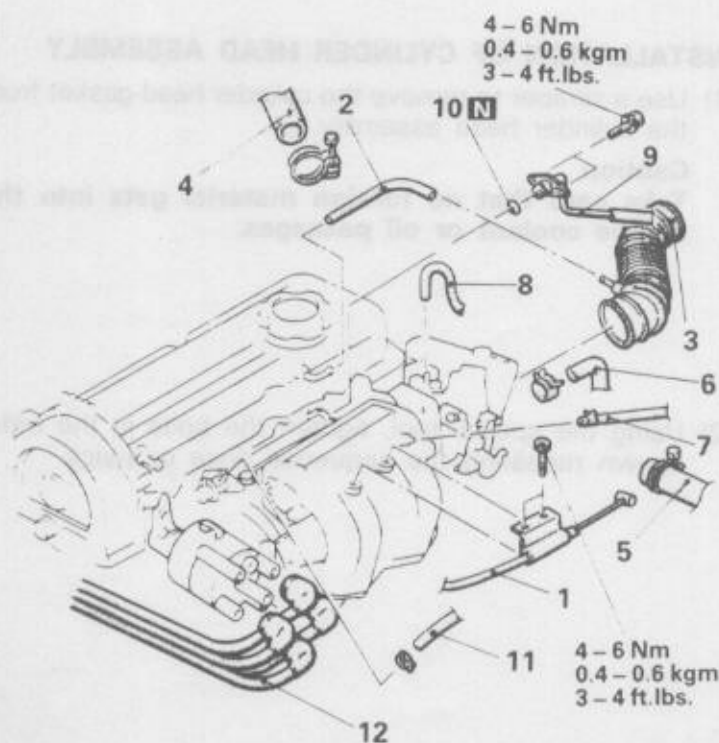
REMOVAL AND INSTALLATION

Pre-removal Operation

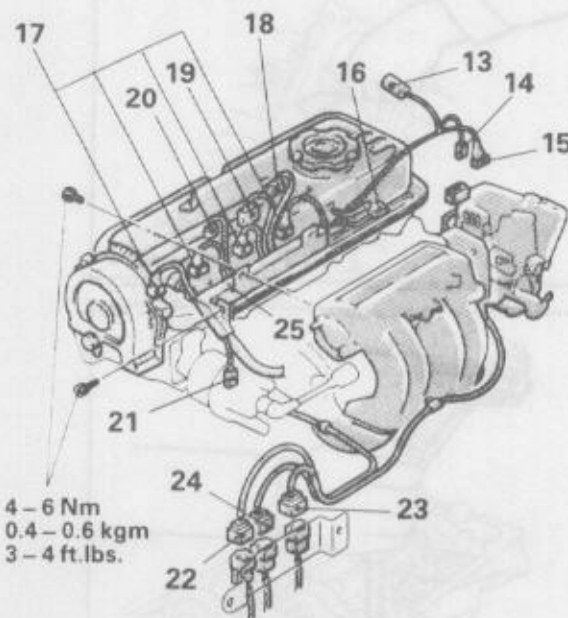
- Draining of Engine Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)

Post-installation Operation

- Supplying Engine Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
- Engine Adjustment (Refer to P 11-26.)



01P0096

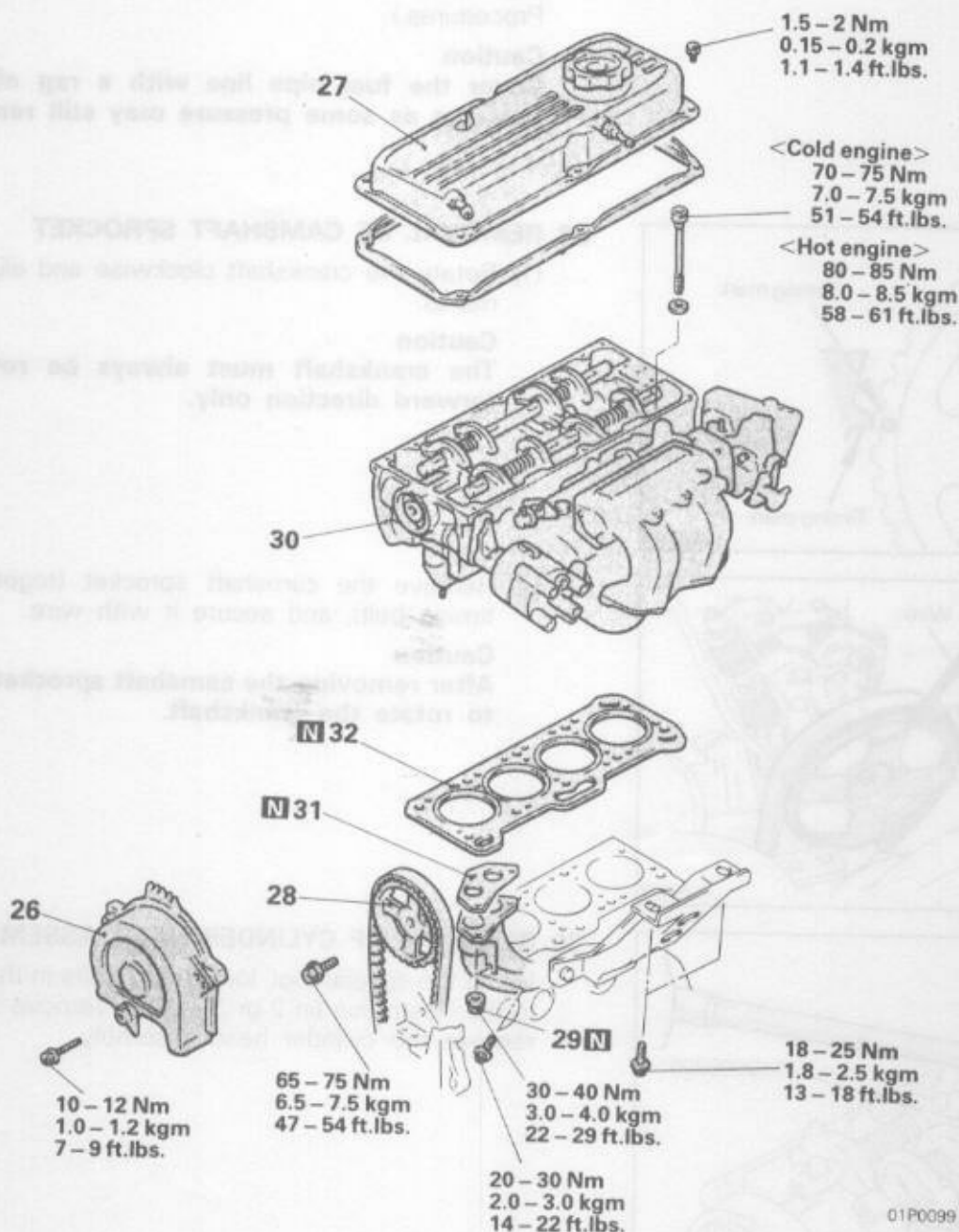


05P0090

Removal steps

- ◆◆ 1. Connection for accelerator cable
2. Breather hose
3. Air intake hose
4. Connection for radiator upper hose
5. Connection for heater hose
6. Connection for water bypass hose
7. Connection for brake booster vacuum hose
8. Connection for vacuum hoses
- ◆◆ 9. Connection for high pressure hose
10. O-ring
11. Connection for fuel return hose
12. Spark plug cable
13. Oxygen sensor connector
<Vehicles with catalytic converter>
14. Engine coolant temperature gauge unit connector
15. Engine coolant temperature sensor connector

16. Idle speed control connector
17. Injector connector
18. Knock sensor connector <Vehicles with catalytic converter>
19. Power transistor connector
20. Ignition coil connector
21. Condenser connector
22. Throttle position sensor
23. Motor position sensor connector
24. Distributor connector
25. Control harness



- 26. Timing belt upper cover
- 27. Rocker cover
- 28. Camshaft sprocket
- 29. Self-locking nut
- 30. Cylinder head assembly
- 31. Gasket
- 32. Cylinder head gasket

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ♦♦: Refer to "Service Points of Removal".
- (3) ♦♦: Refer to "Service Points of Installation".
- (4) N Non-reusable parts

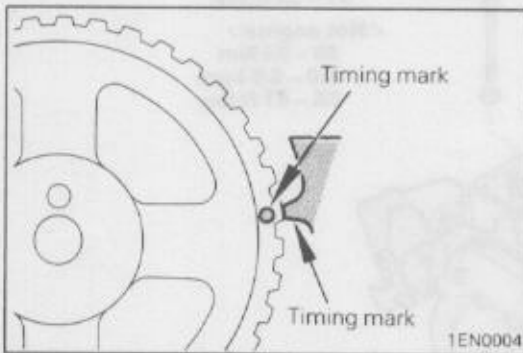
SERVICE POINTS OF REMOVAL

9. DISCONNECTION OF FUEL HIGH PRESSURE HOSE

Relieve pressure in the fuel pipe line to prevent fuel outflow. (Refer to GROUP 13 – Service Adjustment Procedures.)

Caution

Cover the fuel pipe line with a rag after relieving pressure as some pressure may still remain.

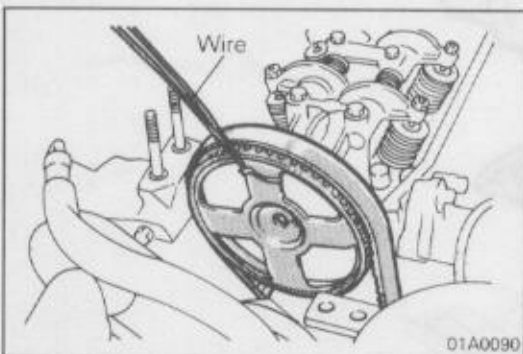


28. REMOVAL OF CAMSHAFT SPROCKET

- (1) Rotate the crankshaft clockwise and align the timing marks.

Caution

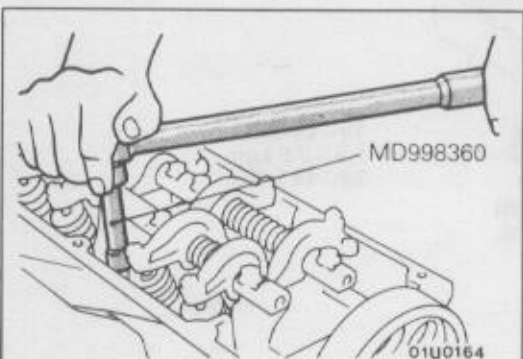
The crankshaft must always be rotated in the forward direction only.



- (2) Remove the camshaft sprocket (together with the timing belt), and secure it with wire.

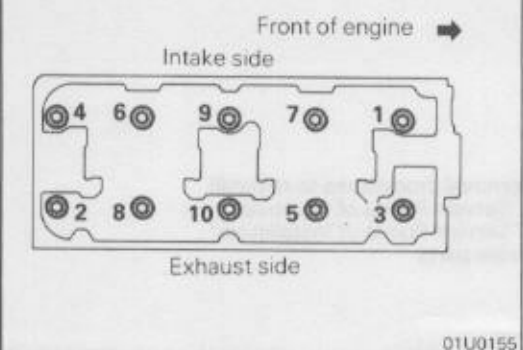
Caution

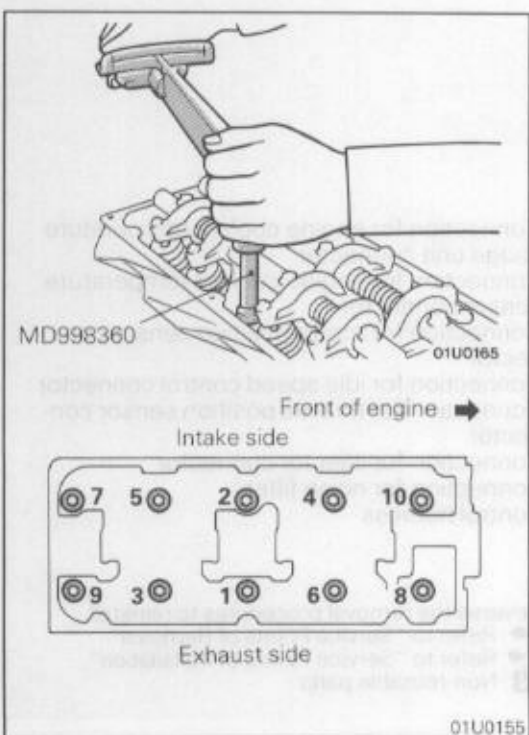
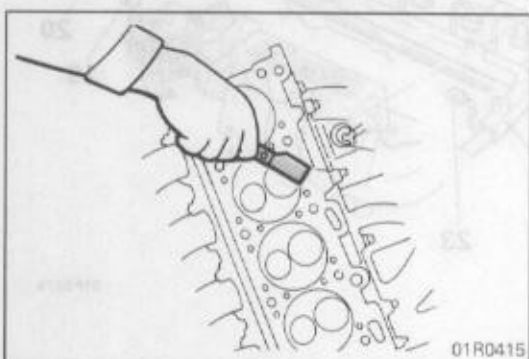
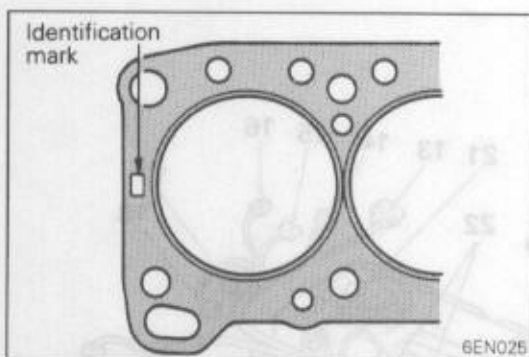
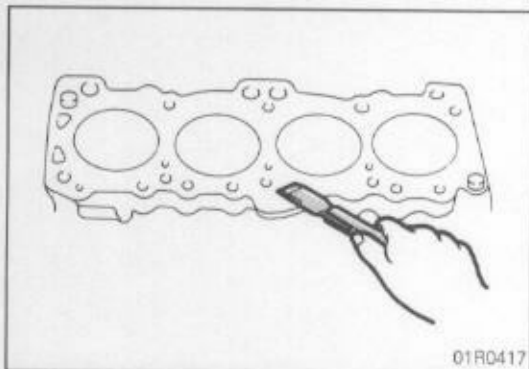
After removing the camshaft sprocket, be sure not to rotate the crankshaft.



30. REMOVAL OF CYLINDER HEAD ASSEMBLY

Using the special tool, loosen the bolts in the order shown in the illustration (in 2 or 3 cycles), remove them and then remove the cylinder head assembly.





SERVICE POINTS OF INSTALLATION

E11JDCF

32. INSTALLATION OF CYLINDER HEAD GASKET

- (1) Use a scraper to remove the cylinder head gasket from the cylinder block.

Caution

Take care that no foreign material gets into the cylinder, or into the engine coolant or oil passages.

- (2) Place the cylinder head gasket on the cylinder block with the marks facing upward.

30. INSTALLATION OF CYLINDER HEAD ASSEMBLY

- (1) Use a scraper to remove the cylinder head gasket from the cylinder head assembly.

Caution

Take care that no foreign material gets into the engine coolant or oil passages.

- (2) Using the special tool, tighten the bolts in the order shown repeating the sequence once or twice.

1. ADJUSTMENT OF ACCELERATOR CABLE

Refer to GROUP 13 – Service Adjustment Procedures.

PWME8802

Vehicles built from June 1990

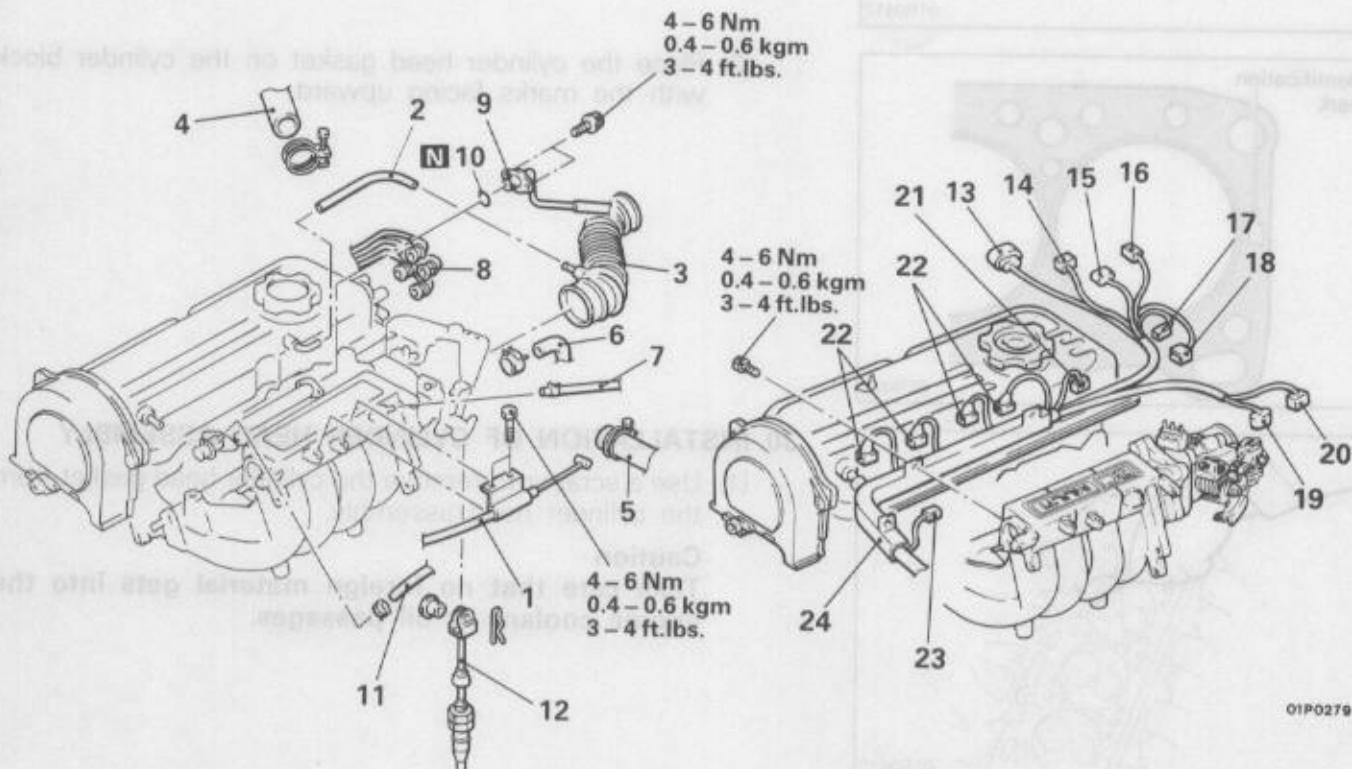
Vehicles built up to May 1992

Pre-removal Operation

- Draining of Engine Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)

Post-installation Operation

- Supplying Engine Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
- Engine Adjustment (Refer to P.11-26.)



01P0276

01P0279

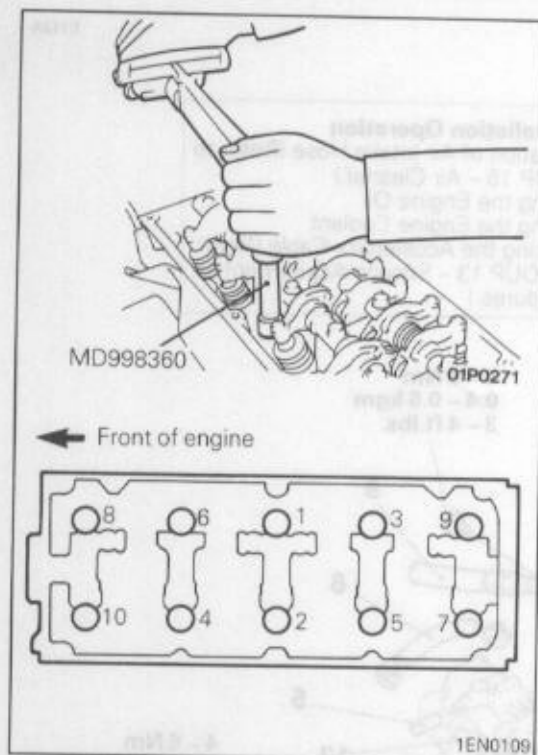
Removal steps

- ◆◆ 1. Connection for accelerator cable
- 2. Breather hose
- 3. Air intake hose
- 4. Connection for radiator upper hose
- 5. Connection for heater hose
- 6. Connection for water bypass hose
- 7. Connection for brake booster vacuum hose
- 8. Spark plug cable
- ◆◆ 9. Connection for fuel high pressure hose
- 10. O-ring
- 11. Connection for fuel return hose
- ◆◆ 12. Connection for throttle control cable <AT>
- 13. Connection for distributor connector
- 14. Connection for distributor connector
- 15. Oxygen sensor connector
- <Vehicles with catalytic converter>
- 16. Connection for condenser connector

- 17. Connection for engine coolant temperature gauge unit connector
- 18. Connection for engine coolant temperature sensor connector
- 19. Connection for motor position sensor connector
- 20. Connection for idle speed control connector
- 21. Connection for throttle position sensor connector
- 22. Connection for injector connector
- 23. Connection for noise filter
- 24. Control harness

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆: Refer to "Service Points of Removal".
- (3) ◆◆: Refer to "Service Points of Installation".
- (4) [N]: Non-reusable parts



30. INSTALLATION OF CYLINDER HEAD ASSEMBLY

Using the special tool, tighten two to three times in the illustrated sequence until snug, finally tightening to the specified torque.

12. ADJUSTMENT OF THROTTLE CONTROL CABLE <A/T>

Refer to GROUP 23 – Service Adjustment Procedures.

1. ADJUSTMENT OF ACCELERATOR CABLE

Refer to GROUP 13 – Service Adjustment Procedures.

Removal steps

1. Belt cable connection
2. Accelerator cable connection
3. PCV hose connection
4. Breather hose connection
5. Vacuum hose connection
6. Water hose connection
7. Throttle body – throttle linkage
8. Throttle body – water inlet pipe
9. Throttle body – water inlet pipe
10. Throttle body – water inlet pipe
11. Throttle body – water inlet pipe
12. Throttle body – water inlet pipe
13. Throttle body – water inlet pipe
14. Throttle body – water inlet pipe
15. Throttle body – water inlet pipe

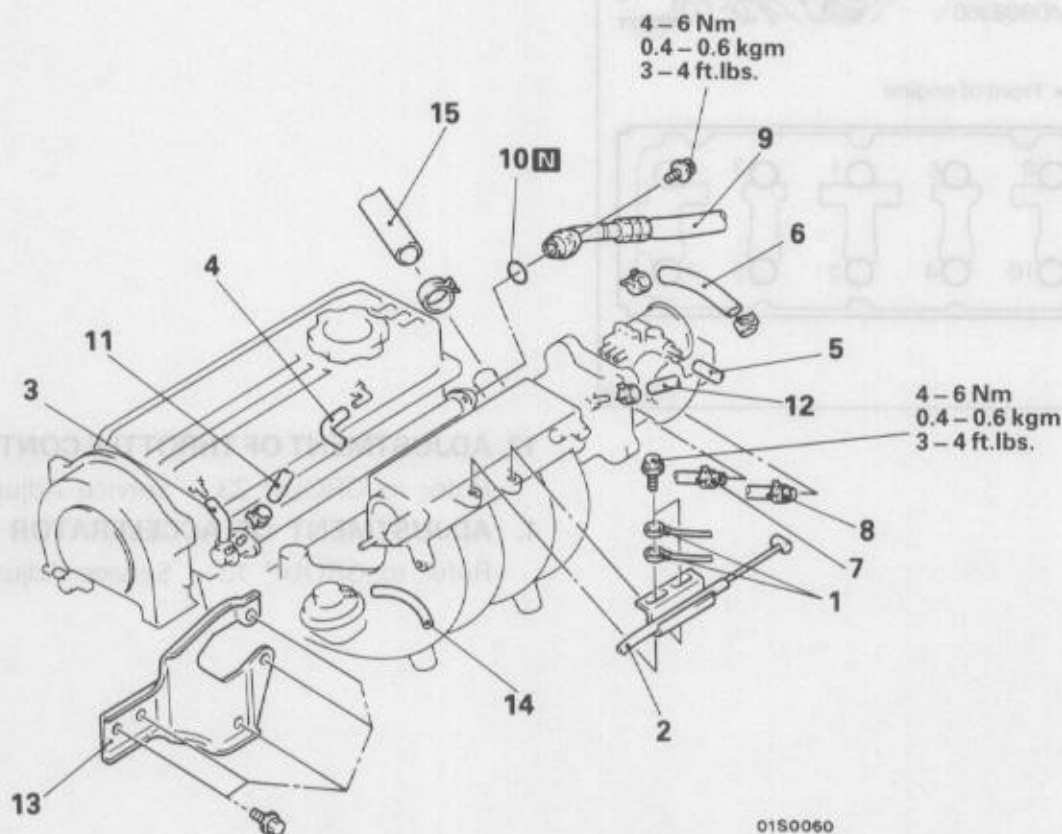
Vehicles built from June 1992 (LANCER – Hatchback)

Pre-removal Operation

- Reduce the Inner Pressure of Fuel Line and Hose (Refer to GROUP 13 – Service Adjustment Procedures.)
- Draining the Engine Coolant
- Draining the Engine Oil
- Removal of Air Intake Hose (Refer to GROUP 15 – Air Cleaner.)

Post-installation Operation

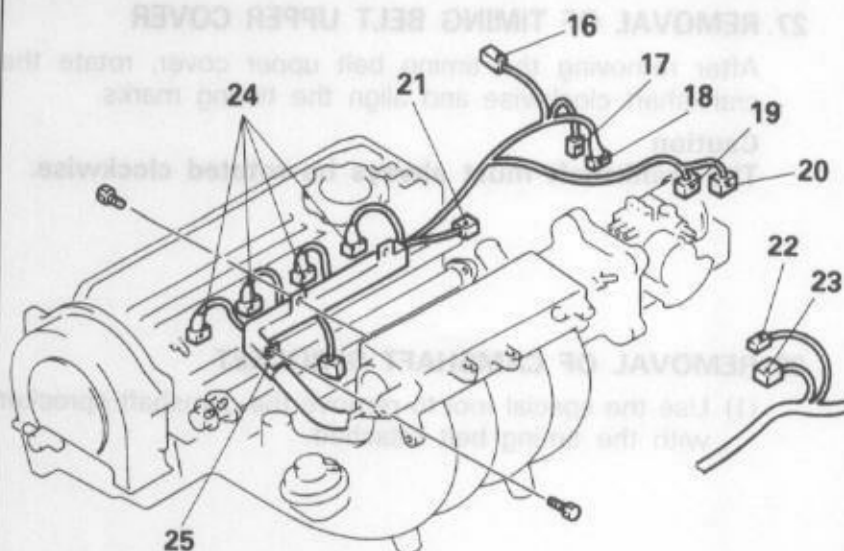
- Installation of Air Intake Hose (Refer to GROUP 15 – Air Cleaner.)
- Refilling the Engine Oil
- Refilling the Engine Coolant
- Adjusting the Accelerator Cable (Refer to GROUP 13 – Service Adjustment Procedures.)

**Removal steps**

1. Earth cable connection
2. Accelerator cable connection
3. PCV hose connection
4. Breather hose connection
5. Vacuum hose connection
6. Water hose connection
(Throttle body → thermostat housing)
7. Water hose connection
(Throttle body → water inlet pipe)
8. Water hose connection
(Heater unit → thermostat housing)
- ◆◆ 9. High-pressure fuel hose connection
10. O-ring
11. Return hose connection
12. Brake booster vacuum hose connection
13. Engine mounting stay
14. Vacuum hose
15. Radiator upper hose

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆: Refer to "Service Points of Removal".
- (3) ◆◆: Refer to "Service Points of Installation".
- (4) N: Non-reusable parts

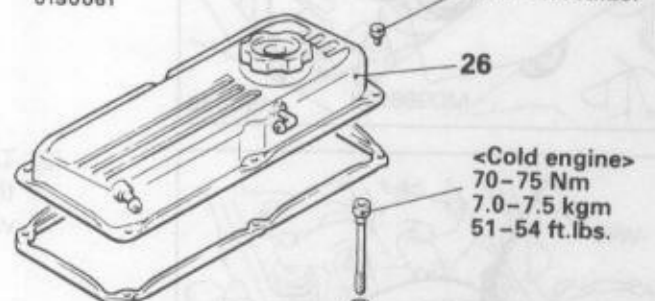


- 16. Oxygen sensor connector
- 17. Ignition coil connector
- 18. Crank angle sensor and top dead center sensor connector
- 19. Engine coolant temperature sensor connector
- 20. Water temperature gauge unit connector
- 21. Throttle position sensor connector
- 22. Idle switch connector
- 23. Idle speed control connector
- 24. Injector connector
- 25. Control harness
- 26. Rocker cover
- 27. Timing belt upper cover
- 28. Camshaft sprocket
- 29. Self-locking nuts
- 30. Cylinder head assembly
- 31. Gasket
- 32. Cylinder head gasket

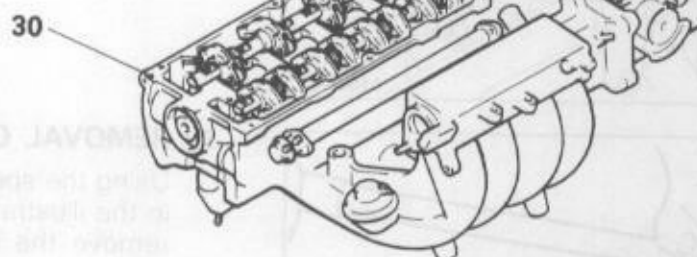
NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆: Refer to "Service Points of Removal".
- (3) ◆◆◆: Refer to "Service Points of Installation".
- (4) **N**: Non-reusable parts

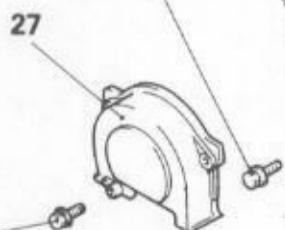
01S0061



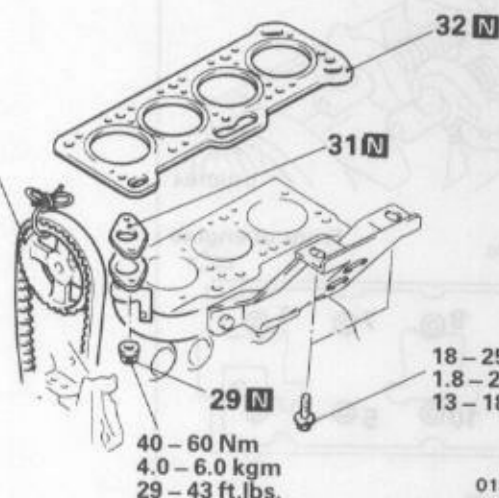
<Cold engine>
70 - 75 Nm
7.0 - 7.5 kgm
51 - 54 ft.lbs.



65 - 75 Nm
6.5 - 7.5 kgm
47 - 54 ft.lbs.



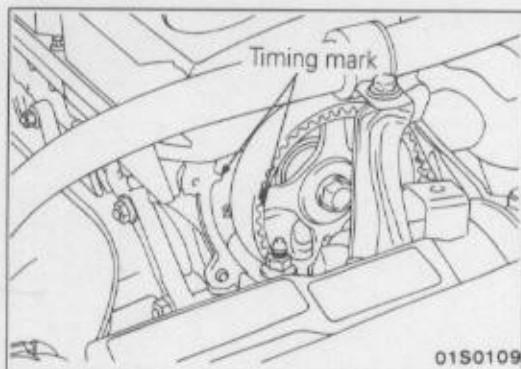
10 - 12 Nm
1.0 - 1.2 kgm
7.2 - 8.7 ft.lbs.



18 - 25 Nm
1.8 - 2.5 kgm
13 - 18 ft.lbs.

40 - 60 Nm
4.0 - 6.0 kgm
29 - 43 ft.lbs.

01S0062



SERVICE POINTS OF REMOVAL

E11JB8D

27. REMOVAL OF TIMING BELT UPPER COVER

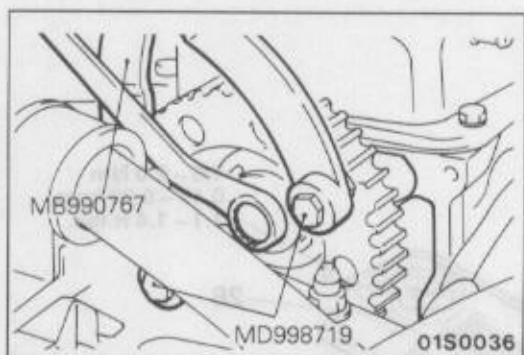
After removing the timing belt upper cover, rotate the crankshaft clockwise and align the timing marks.

Caution

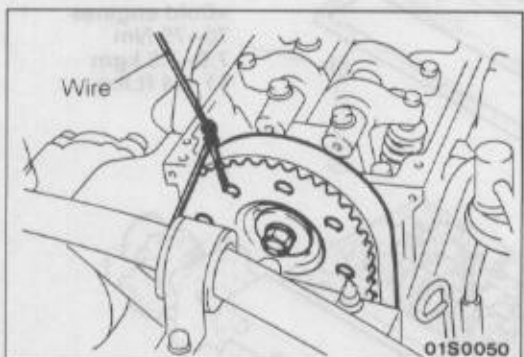
The crankshaft must always be rotated clockwise.

28. REMOVAL OF CAMSHAFT SPROCKET

- (1) Use the special tool to remove the camshaft sprocket with the timing belt attached.

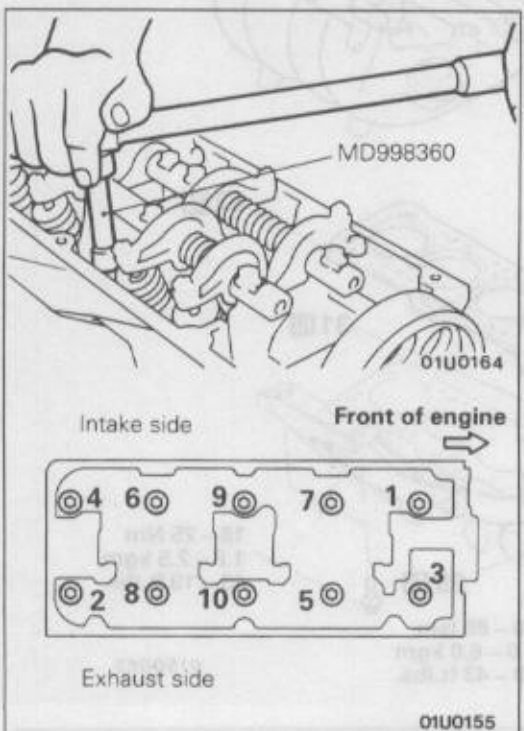


- (2) Tie the camshaft sprocket and timing belt with a wire so that the position of the camshaft sprocket will not move with respect to the timing belt.



30. REMOVAL OF CYLINDER HEAD ASSEMBLY

Using the special tool, loosen the bolts in the order shown in the illustration (in 2 or 3 cycles), remove them and then remove the cylinder head assembly.



E11JDCY

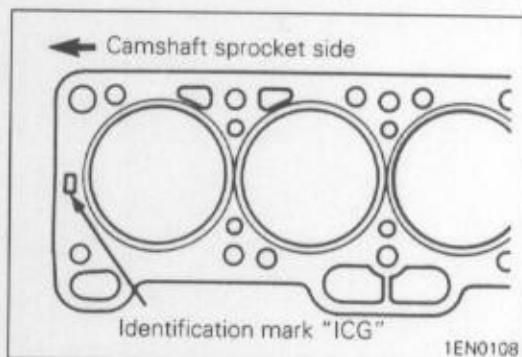
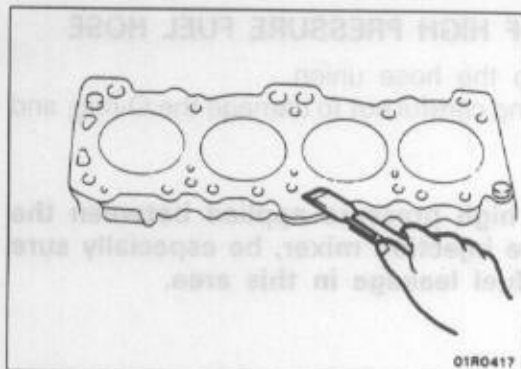
SERVICE POINTS OF INSTALLATION

32. INSTALLATION OF CYLINDER HEAD GASKET

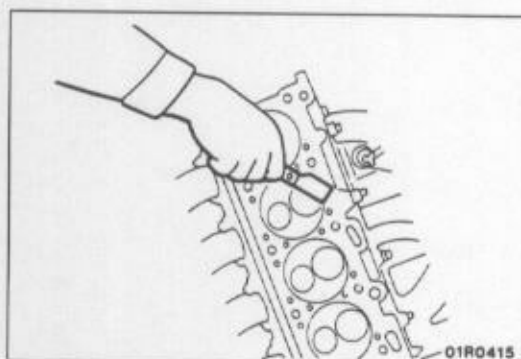
- (1) Use a scraper to remove the cylinder head gasket from the cylinder block.

Caution

Take care that no foreign material gets into the cylinder, or into the engine coolant or oil passages.



- (2) Place the cylinder head gasket on the cylinder block with the marks facing upward.

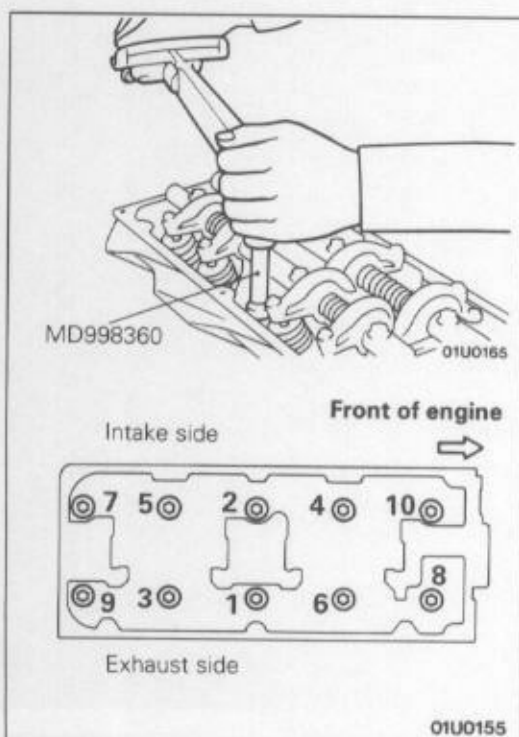


30. INSTALLATION OF CYLINDER HEAD ASSEMBLY

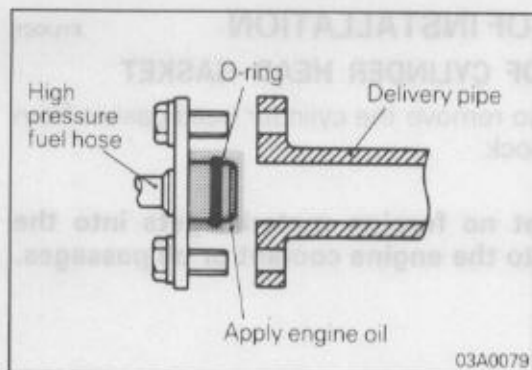
- (1) Use a scraper to remove the cylinder head gasket from the cylinder head assembly.

Caution

Take care that no foreign material gets into the engine coolant or oil passages.



- (2) Using the special tool, tighten the bolts in the order shown repeating the sequence once or twice.

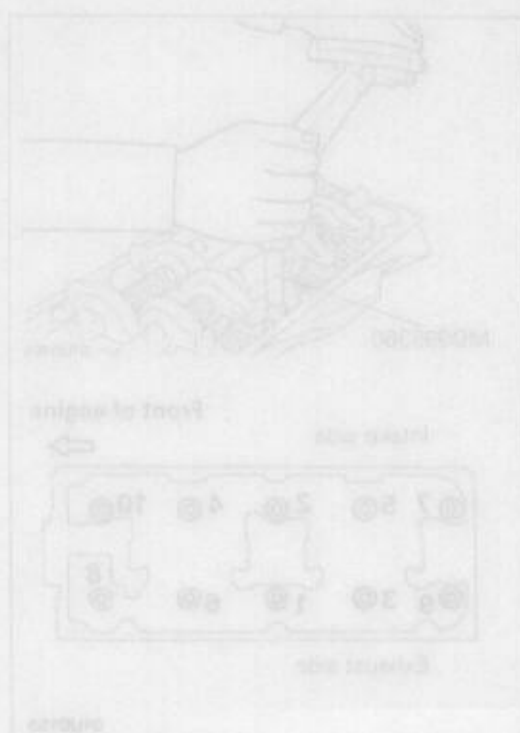
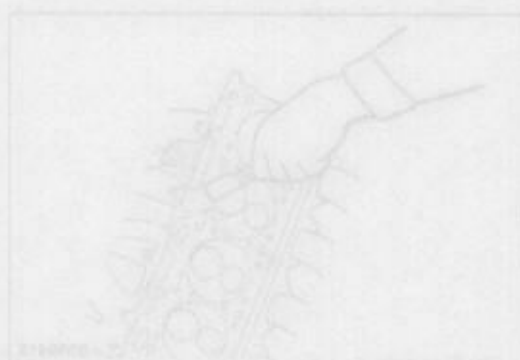
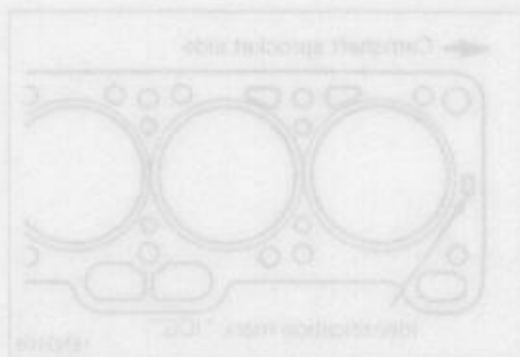


9. INSTALLATION OF HIGH PRESSURE FUEL HOSE

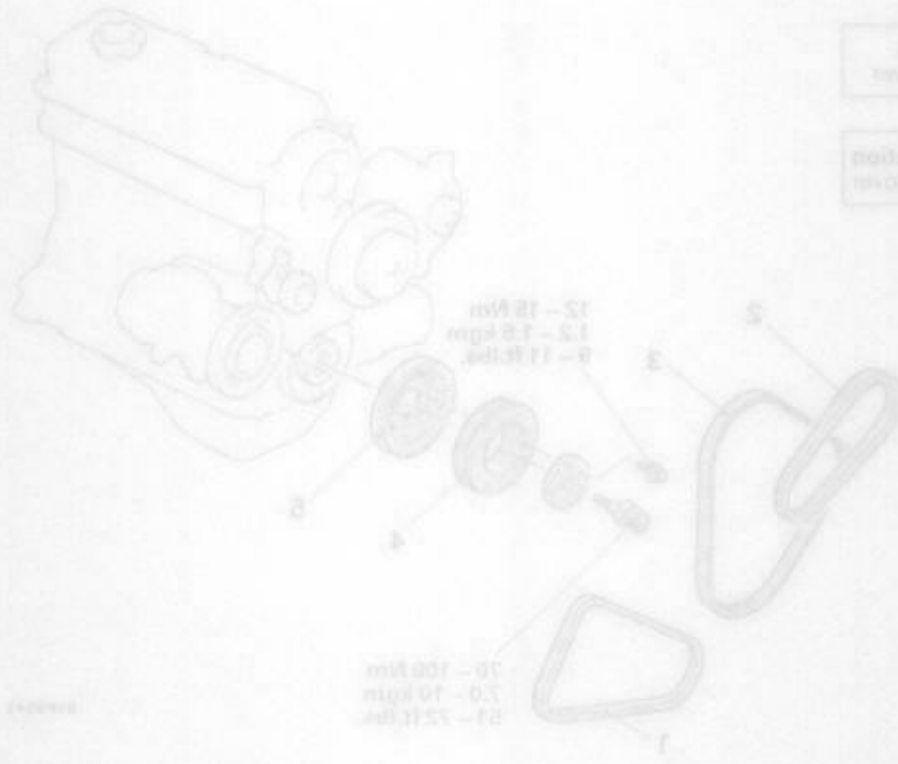
Apply engine oil to the hose union.
Insert the hose, being careful not to damage the O-ring, and tighten securely.

Caution

Because there is high pressure applied between the fuel pump and the injection mixer, be especially sure that there is no fuel leakage in this area.



NOTES

CRANKSHAFT PULLEY
REMOVAL AND INSTALLATION

Pre-removal Operation
• Removal of Under Cover

Post-removal Operation
• Installation of Under Cover

Removal steps

1. Drive belt (air conditioner)
2. Drive belt (power steering)
3. Drive belt (alternator)
4. Crankshaft compressor pulley
5. Crankshaft pulley

NOTE
1. Remove the timing belt tensioner to install.
2. Refer to "Crankshaft Pulley Removal".
3. Refer to "Crankshaft Pulley Installation".

SERVICE POINTS OF REMOVAL

A. REMOVAL OF CRANKSHAFT COMPRESSOR PULLEY
B. CRANKSHAFT PULLEY

Remove the crankshaft pulley and crankshaft compressor pulley in the following procedure. <Vehicle for European market>

- (1) Using the special tool and a disconnected drive belt, stop the rotation of the crankshaft pulley.

Caution

1. This drive belt will get damaged. Do not use the engine's drive belt.
2. Never use a damaged drive belt.
- (2) Remove the crankshaft sprocket bolts.
- (3) Remove the crankshaft pulley bolts, and remove the crankshaft pulley and crankshaft compressor pulley.



CRANKSHAFT PULLEY

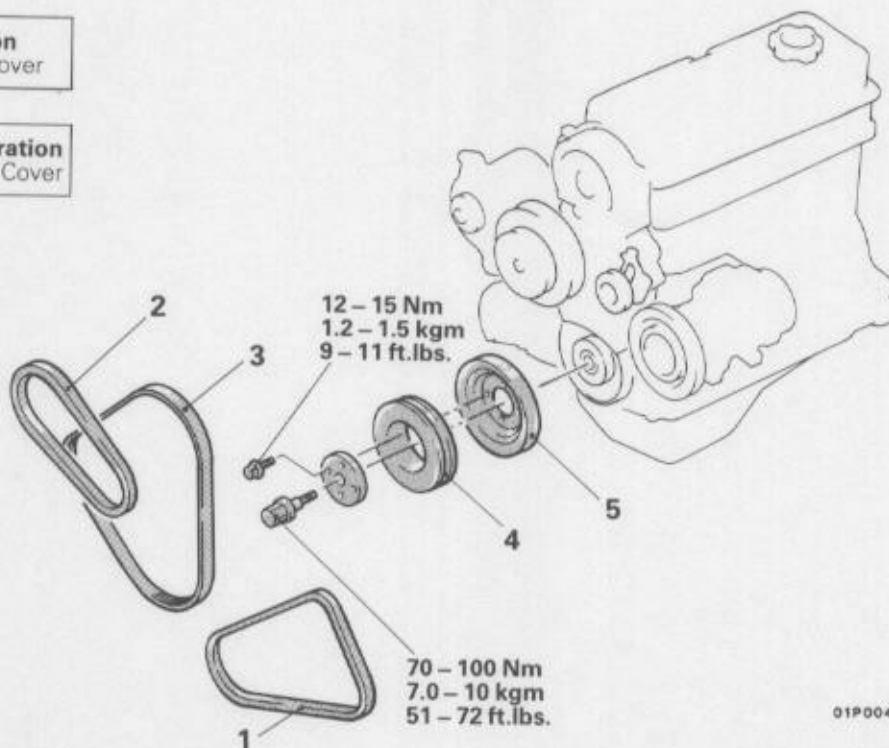
REMOVAL AND INSTALLATION

Pre-removal Operation

- Removal of Under Cover

Post-installation Operation

- Installation of Under Cover



Removal steps

- ◆◆ 1. Drive belt (Air conditioner)
- ◆◆ 2. Drive belt (Power steering)
- ◆◆ 3. Drive belt (Alternator)
- ◆◆ ◆◆ 4. Crankshaft compressor pulley (Air conditioner)
- ◆◆ ◆◆ 5. Crankshaft pulley.

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆: Refer to "Service Points of Removal".
- (3) ◆◆◆: Refer to "Service Points of Installation".

SERVICE POINTS OF REMOVAL

E11LB8B

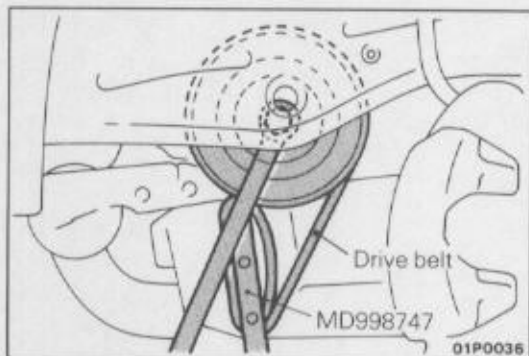
4. REMOVAL OF CRANKSHAFT COMPRESSOR PULLEY / 5. CRANKSHAFT PULLEY

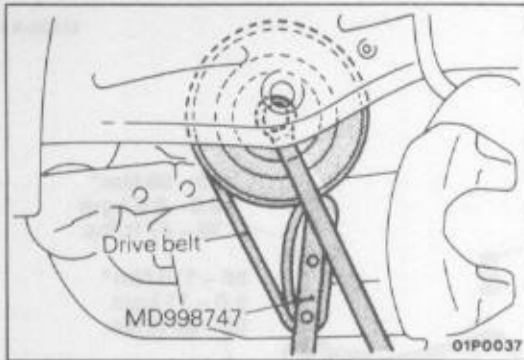
Remove the crankshaft pulley and crankshaft compressor pulley in the following procedure. <Vehicles for Europe and Australia>

- (1) Using the special tool and a discarded drive belt, stop the rotation of the crankshaft pulley.

Caution

- 1. This drive belt will get damaged. Do Not use the engine's drive belt.
- 2. Never use a damaged drive belt.
- (2) Remove the crankshaft sprocket bolts.
- (3) Remove the crankshaft pulley bolts, and remove the crankshaft pulley and crankshaft compressor pulley.





SERVICE POINTS OF INSTALLATION

E11LDBC

5. INSTALLATION OF CRANKSHAFT PULLEY / 4. CRANKSHAFT COMPRESSOR PULLEY

Install the crankshaft pulley and crankshaft compressor pulley in the following procedure. <Vehicles for Europe and Australia>

- (1) Using the special tool and a discarded drive belt, stop the rotation of the crankshaft pulley.
- (2) Tighten the crankshaft sprocket bolt to the specified torque.

3. 2. 1. ADJUSTMENT OF DRIVE BELTS TENSION

Refer to P.11-14.

TIMING BELT

REMOVAL AND INSTALLATION

E11GA-A

Pre-removal Operation

- Removal of Under Cover

Post-installation Operation

- Installation of Under Cover
- Engine Adjustment
(Refer to P.11-11, 26.)

50 – 65 Nm*
5.0 – 6.5 kgm
36 – 47 ft.lbs.

50 – 65 Nm*
5.0 – 6.5 kgm
36 – 47 ft.lbs.

90 – 110 Nm*
9.0 – 11 kgm
65 – 80 ft.lbs.

45 – 60 Nm
4.5 – 6.0 kgm
33 – 43 ft.lbs.

01P0017

8 – 10 Nm
0.8 – 1.0 kgm
6 – 7 ft.lbs.

01P0026

12 – 15 Nm
1.2 – 1.5 kgm
9 – 11 ft.lbs.

70 – 100 Nm
7.0 – 10 kgm
51 – 72 ft.lbs.

18 – 22 Nm
1.8 – 2.2 kgm
13 – 15 ft.lbs.

10 – 12 Nm
1.0 – 1.2 kgm
7 – 9 ft.lbs.

20 – 27 Nm
2.0 – 2.7 kgm
14 – 20 ft.lbs.

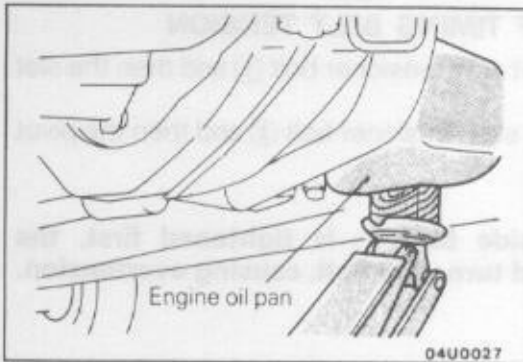
01P0114

Removal steps

- ◆◆ 1. Engine mount bracket
- ◆◆◆ 2. Drive belt (Air conditioner)
- ◆◆◆ 3. Drive belt (Power steering)
- ◆◆◆ 4. Drive belt (Alternator)
- ◆◆◆ 5. Tension pulley bracket
- ◆◆◆ 6. Water pump pulley (Power steering)
- ◆◆◆ 7. Water pump pulley
- ◆◆◆◆ 8. Crankshaft compressor pulley
(Air conditioner)
- ◆◆◆◆ 9. Crankshaft pulley
- ◆◆◆◆ 10. Timing belt upper cover
- ◆◆◆◆ 11. Timing belt lower cover
- ◆◆◆◆ Adjustment of timing belt tension
- ◆◆◆◆ 12. Timing belt

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆◆ Refer to "Service Points of Removal".
- (3) ◆◆◆◆ Refer to "Service Points of Installation".
- (4) The fasteners marked * should be temporarily tightened before they are finally tightened once the total weight of the engine has been placed on the vehicle body.

**SERVICE POINTS OF REMOVAL**

E11GBGA

1. REMOVAL OF ENGINE MOUNT BRACKET

- (1) Jack up the vehicle after placing a wooden block between the jack and the engine's oil pan.

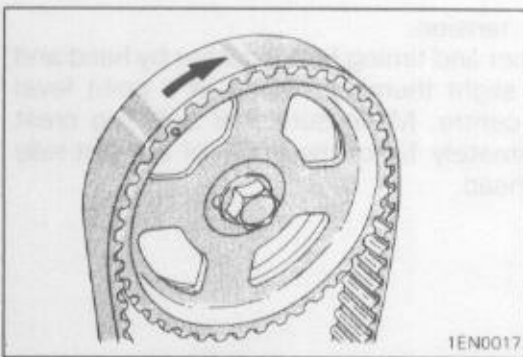
Caution

Jack up carefully, so as not to stress excessively the various parts.

- (2) Remove the engine mount bracket.

8. REMOVAL OF CRANKSHAFT COMPRESSOR PULLEY / 9. CRANKSHAFT PULLEY

Refer to P.11-44.

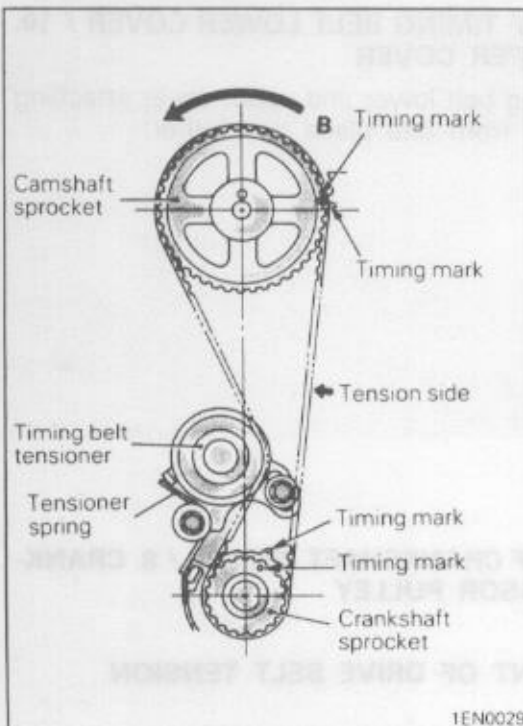
**12. REMOVAL OF TIMING BELT**

Make a mark on the back of the timing belt indicating the direction of rotation so it may be reassembled in the same direction if it is to be reused.

Caution

Water or oil on the belt shortens its life drastically, so the removed timing belt, sprocket, and tensioner must be free from oil and water. These parts should not be washed. Replace parts if seriously contaminated.

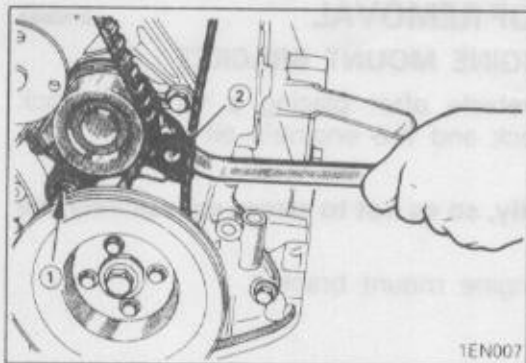
If there is oil or water on each part check the front case oil seals, camshaft oil seal and water pump for leaks.

**SERVICE POINTS OF INSTALLATION**

E11GDGA

12. INSTALLATION OF TIMING BELT

- (1) Align the timing marks on the camshaft sprocket and crankshaft sprocket. (Now the piston in No. 1 cylinder is at the top dead centre on the compression stroke.)
- (2) Set the timing belt first on crankshaft sprocket and then keeping the tension side of belt tight, set on the camshaft sprocket.
- (3) Apply counterclockwise force (in the direction B) to the camshaft sprocket to give tension to the belt on tension side and make sure that all timing marks are lined up.
- (4) Install the crankshaft pulley temporarily. This is to prevent the belt from coming off when crankshaft is turned.



• ADJUSTMENT OF TIMING BELT TENSION

- (1) Loosen the pivot side tensioner bolt ① and then the slot side bolt ②.
- (2) Tighten the slot side tensioner bolt ② and then the pivot side bolt ①.

Caution

If the pivot side bolt ① is tightened first, the tensioner could turn with bolt, causing overtension.

- (3) Turn the crankshaft clockwise.

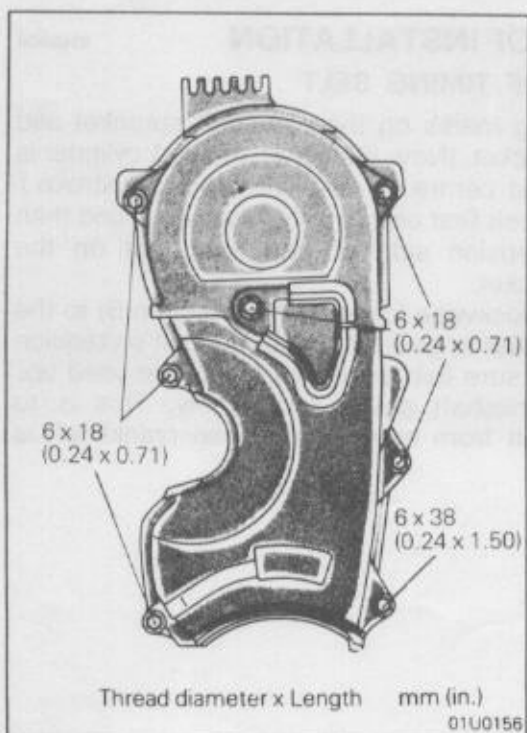
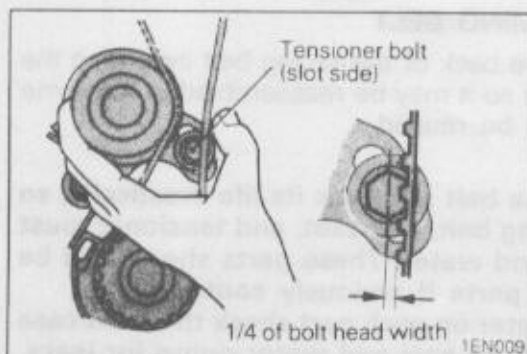
Caution

1. Turn the crankshaft smoothly at a constant speed. Do not turn it counterclockwise.
2. Do not apply any other force than spring force to give tension to the belt.

- (4) Loosen the pivot side tensioner bolt ① and then the slot side bolt ②.
- (5) Tighten the slot side bolt ② and then the pivot side bolt ①.

- (6) Check the belt tension.

Hold the tensioner and timing belt together by hand and give the belt a slight thumb pressure at a point level with tensioner centre. Make sure that belt cog crest deflects approximately 1/4 of the width of the slot side tensioner bolt head.



11. INSTALLATION OF TIMING BELT LOWER COVER / 10. TIMING BELT UPPER COVER

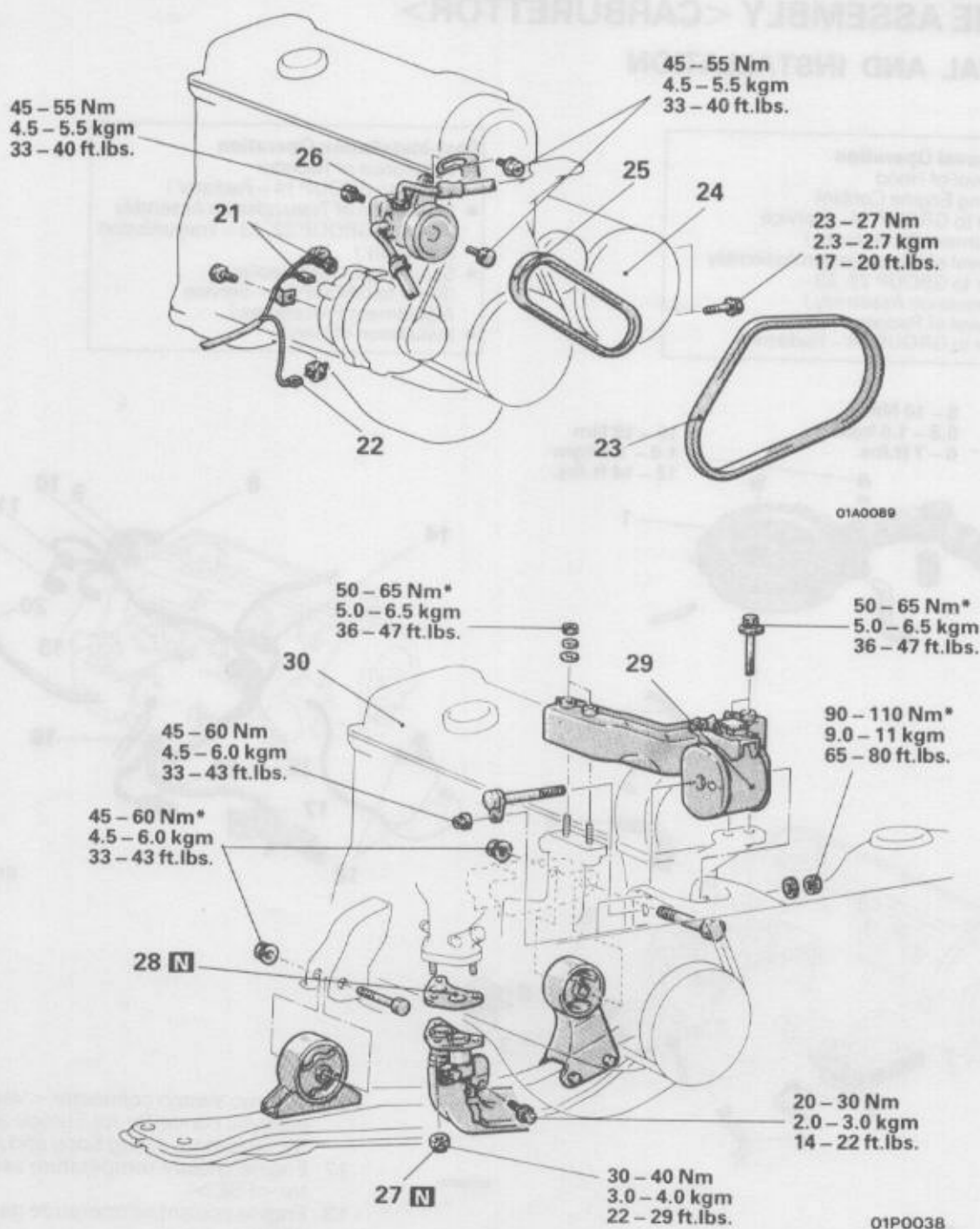
Note that the timing belt lower and upper cover attaching bolts differ in size from one place to another.

9. INSTALLATION OF CRANKSHAFT PULLEY / 8. CRANKSHAFT COMPRESSOR PULLEY

Refer to P.11-44.

4. 3. 2. ADJUSTMENT OF DRIVE BELT TENSION

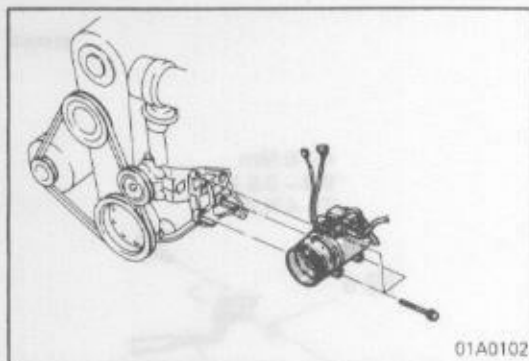
Refer to P.11-14.

**Removal steps**

- 21. Alternator connector
- 22. Connection for oil pressure switch
- ♦♦ 23. Drive belt (Air conditioner)
- ♦♦ 24. Air conditioner compressor
- ♦♦ 25. Drive belt (Power steering)
- ♦♦ 26. Power steering oil pump
- 27. Self-locking nut
- 28. Gasket
- ♦♦ 29. Engine mount bracket
- ♦♦ ♦♦ 30. Engine assembly

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ♦♦ Refer to "Service Points of Removal".
- (3) ♦♦ Refer to "Service Points of Installation".
- (4) **N** Non-reusable parts
- (5) The fasteners marked * should be temporarily tightened before they are finally tightened once the total weight of the engine has been placed on the vehicle body.

**SERVICE POINTS OF REMOVAL**

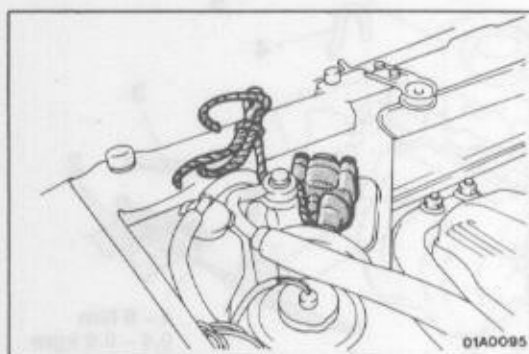
E11TBAB0

24. REMOVAL OF AIR CONDITIONER COMPRESSOR

Disconnect the connection of the air conditioner compressor, and then remove the compressor (with the hose attached) from the compressor bracket.

NOTE

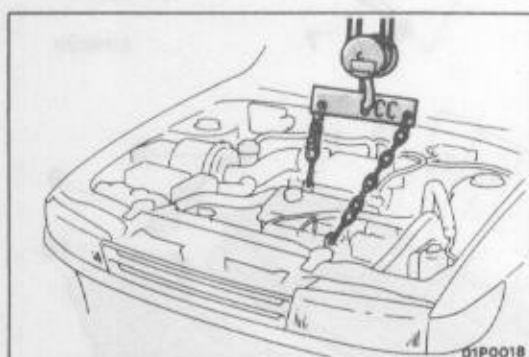
Suspend the removed air conditioner compressor (by using wire or similar material) at a place where it will not be damaged during removal/installation of the engine assembly.

**26. REMOVAL OF POWER STEERING OIL PUMP .**

Remove the oil pump (with the hose attached).

NOTE

Suspend the removed oil pump (by using wire or similar material) at a place where it will not be damaged during removal/installation of the engine assembly.

**29. REMOVAL OF ENGINE MOUNT BRACKET**

- (1) Attach wire or similar material to the engine hook, and then suspend (to the extent that there is no slackness of the wire) by using a chain block or similar arrangement.
- (2) Remove the engine mount bracket.

30. REMOVAL OF ENGINE ASSEMBLY

- (1) Check to be sure that all cables, hoses, harness connectors, etc. are disconnected from the engine.
- (2) Lift the chain block slowly to remove the engine assembly upward from the engine compartment.

SERVICE POINTS OF INSTALLATION

E11TDAC0

30. INSTALLATION OF ENGINE ASSEMBLY

When installing the engine assembly, check carefully to be sure that all pipes and hoses are connected, and that none are twisted, damaged, etc.

25. 23. ADJUSTMENT OF DRIVE BELT TENSION

Refer to P.11-14.

2. ADJUSTMENT OF ACCELERATOR CABLE

Refer to GROUP 13 – Service Adjustment Procedures.

ENGINE ASSEMBLY <MPI>

E11TA-8

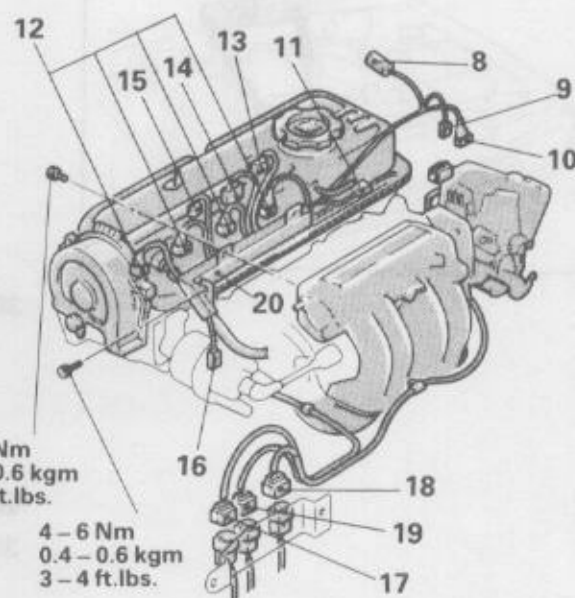
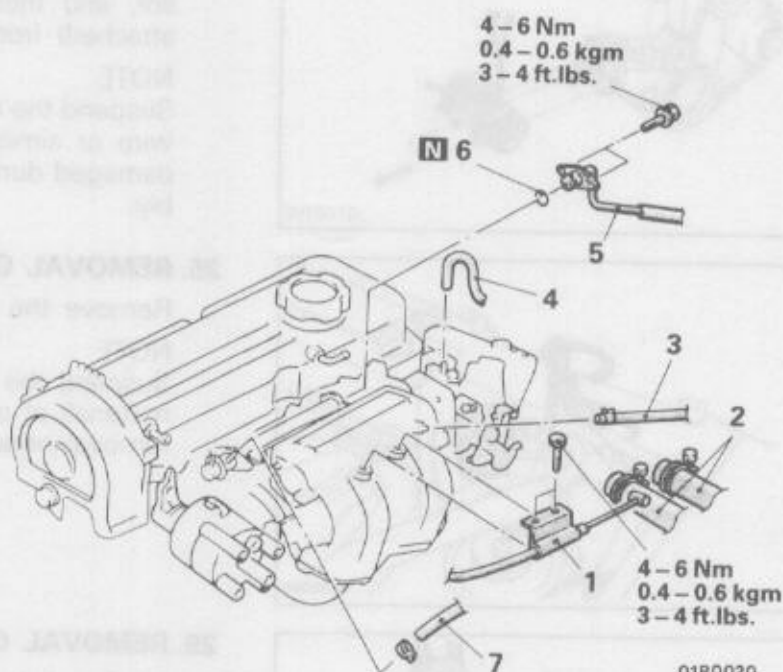
REMOVAL AND INSTALLATION

Pre-removal Operation

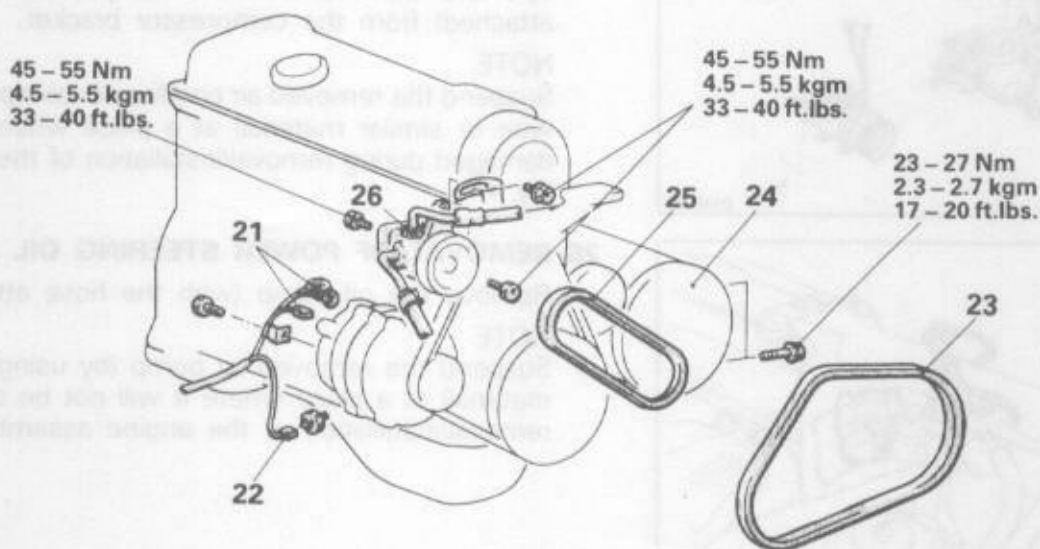
- Eliminating Fuel Pressure in Fuel Lines (Refer to GROUP 13 – Service Adjustment Procedures.)
- Removal of Hood
- Draining Engine Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
- Removal of Transmission Assembly (Refer to GROUP 22, 23 – Transmission Assembly.)
- Removal of Radiator Assembly (Refer to GROUP 14 – Radiator.)

Post-installation Operation

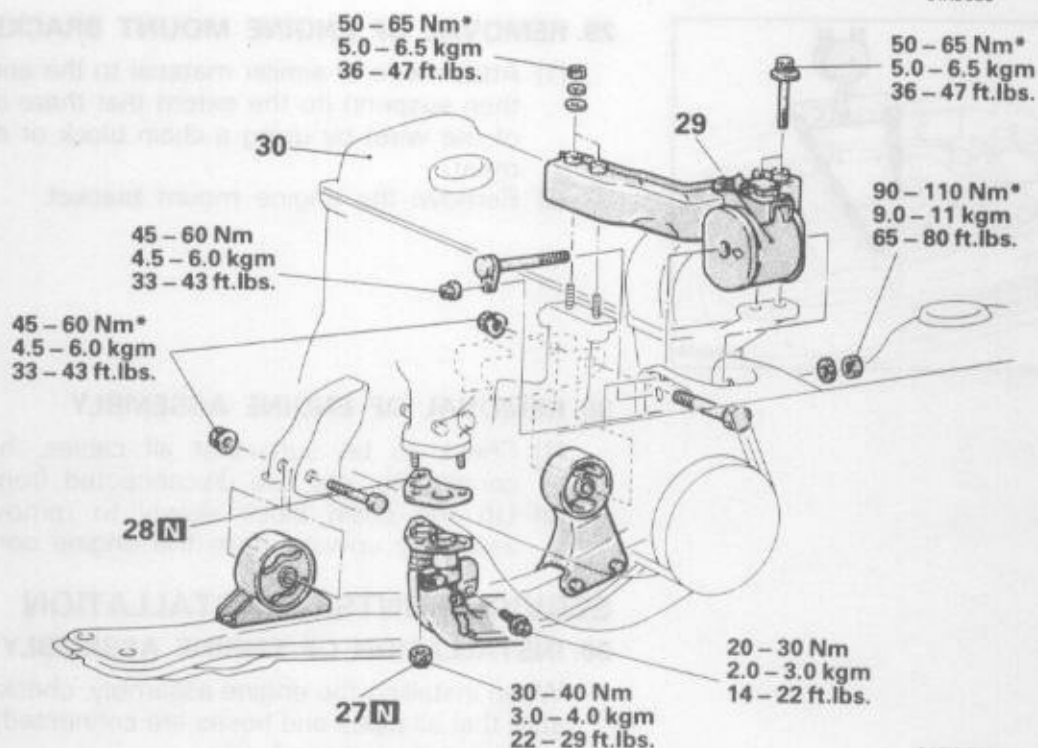
- Installation of Radiator Assembly (Refer to GROUP 14 – Radiator.)
- Installation of Transmission Assembly (Refer to GROUP 22, 23 – Transmission Assembly.)
- Refilling Engine Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
- Installation of Hood

**Removal steps**

1. Connection for accelerator cable
2. Connection for heater hose
3. Connection for brake booster vacuum hose
4. Connection for vacuum hoses
5. Connection for fuel high pressure hose
6. O-ring
7. Connection for fuel return hose
8. Oxygen sensor connector <Vehicles with catalytic converter>
9. Engine coolant temperature gauge unit connector
10. Engine coolant temperature sensor connector
11. Idle speed control connector
12. Injector connector
13. Knock sensor connector <Vehicles with catalytic converter>
14. Power transistor connector
15. Ignition coil connector
16. Condenser connector
17. Throttle position sensor connector
18. Motor position sensor connector
19. Distributor connector
20. Control harness



01A0089

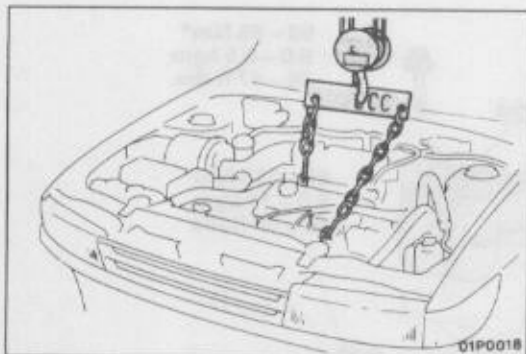
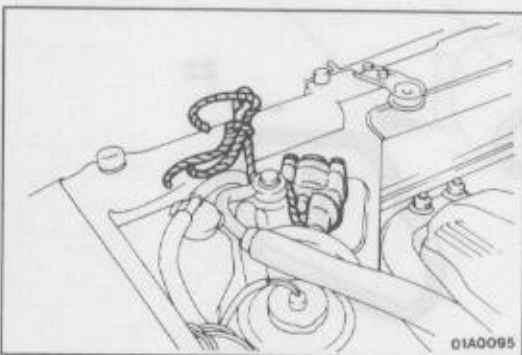
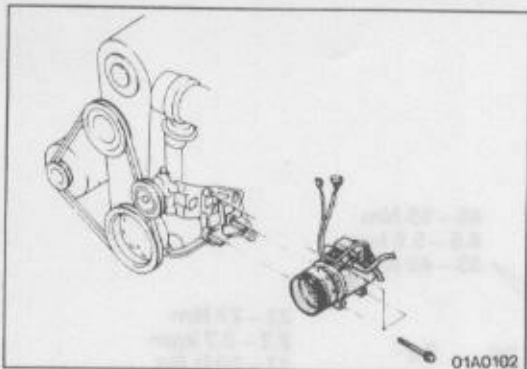


01P0038

- 21. Alternator connector
- 22. Connection for oil pressure switch
- ♦♦ 23. Drive belt (Air conditioner)
- ♦♦ 24. Air conditioner compressor
- ♦♦ 25. Drive belt (Power steering)
- ♦♦ 26. Power steering oil pump
- 27. Self-locking nut
- 28. Gasket
- ♦♦ 29. Engine mount bracket
- ♦♦ ♦♦ 30. Engine assembly

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ♦♦: Refer to "Service Points of Removal".
- (3) ♦♦♦: Refer to "Service Points of Installation".
- (4) **N**: Non-reusable parts
- (5) The fasteners marked * should be temporarily tightened before they are finally tightened once the total weight of the engine has been placed on the vehicle body.



SERVICE POINTS OF REMOVAL

E11TBAB1

24. REMOVAL OF AIR CONDITIONER COMPRESSOR

Disconnect the connection of the air conditioner compressor, and then remove the compressor (with the hose attached) from the compressor bracket.

NOTE

Suspend the removed air conditioner compressor (by using wire or similar material) at a place where it will not be damaged during removal/installation of the engine assembly.

26. REMOVAL OF POWER STEERING OIL PUMP

Remove the oil pump (with the hose attached).

NOTE

Suspend the removed oil pump (by using wire or similar material) at a place where it will not be damaged during removal/installation of the engine assembly.

29. REMOVAL OF ENGINE MOUNT BRACKET

- (1) Attach wire or similar material to the engine hook, and then suspend (to the extent that there is no slackness of the wire) by using a chain block or similar arrangement.
- (2) Remove the engine mount bracket.

30. REMOVAL OF ENGINE ASSEMBLY

- (1) Check to be sure that all cables, hoses, harness connectors, etc. are disconnected from the engine.
- (2) Lift the chain block slowly to remove the engine assembly upward from the engine compartment.

SERVICE POINTS OF INSTALLATION

E11TDAC1

30. INSTALLATION OF ENGINE ASSEMBLY

When installing the engine assembly, check carefully to be sure that all pipes and hoses are connected, and that none are twisted, damaged, etc.

25. 23. ADJUSTMENT OF DRIVE BELT TENSION

Refer to P.11-14.

1. ADJUSTMENT OF ACCELERATOR CABLE

Refer to GROUP 13 - Service Adjustment Procedures.

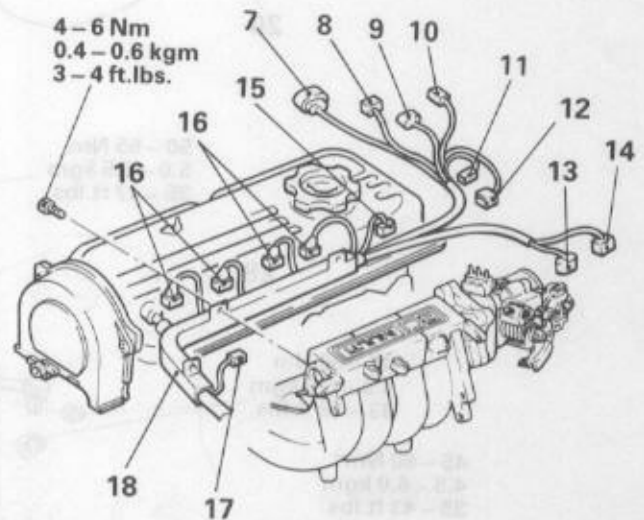
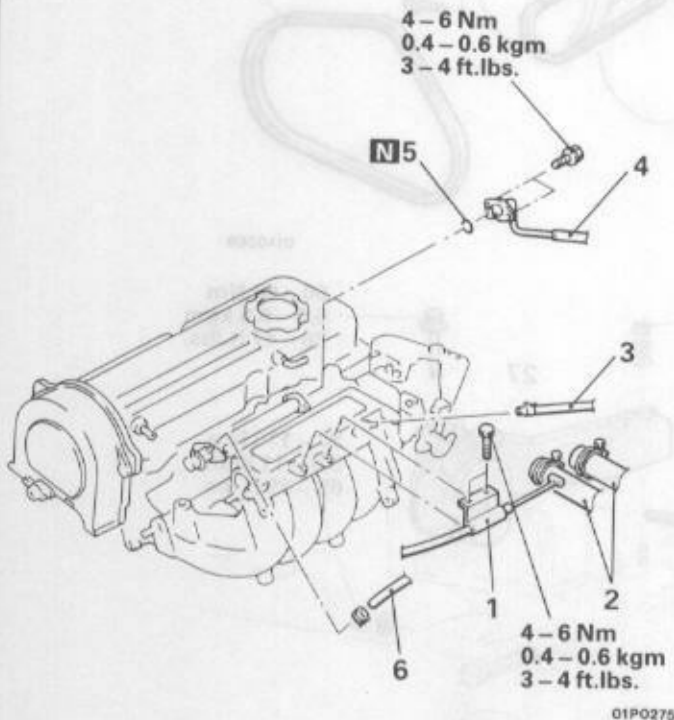
Vehicles built from June 1990
Vehicles built up to May 1992

Pre-removal Operation

- Elimination of Fuel Pressure in Fuel Lines (Refer to GROUP 13 – Service Adjustment Procedures.)
- Removal of Hood
- Draining Engine Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
- Removal of Transmission Assembly (Refer to GROUP 22, 23 – Transmission Assembly.)
- Removal of Radiator Assembly (Refer to GROUP 14 – Radiator.)

Post-installation Operation

- Installation of Radiator Assembly (Refer to GROUP 14 – Radiator.)
- Installation of Transmission Assembly (Refer to GROUP 22, 23 – Transmission Assembly.)
- Refilling Engine Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
- Installation of Hood

**Removal steps**

- ♦♦ 1. Connection for accelerator cable
2. Connection for heater hose
3. Connection for brake booster vacuum hose
4. Connection for fuel high pressure hose
5. O-ring
6. Connection for fuel return hose
7. Connection for distributor connector
8. Connection for distributor connector
9. Connection for oxygen sensor connector <Vehicles with catalytic converter>
10. Connection for condenser connector
11. Connection for engine coolant temperature gauge unit connector
12. Connection for engine coolant temperature sensor connector
13. Connection for motor position sensor connector
14. Connection for idle speed control connector
15. Connection for throttle position sensor
16. Connection for injector connector
17. Connection for noise filter
18. Control harness

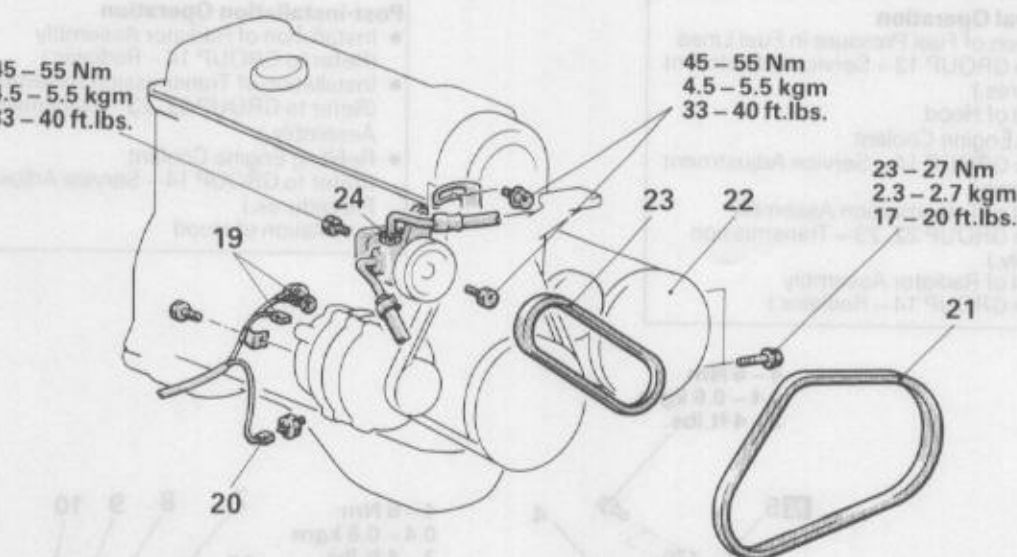
NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ♦♦: Refer to "Service Points of Installation".

45 – 55 Nm
4.5 – 5.5 kgm
33 – 40 ft.lbs.

45 – 55 Nm
4.5 – 5.5 kgm
33 – 40 ft.lbs.

23 – 27 Nm
2.3 – 2.7 kgm
17 – 20 ft.lbs.



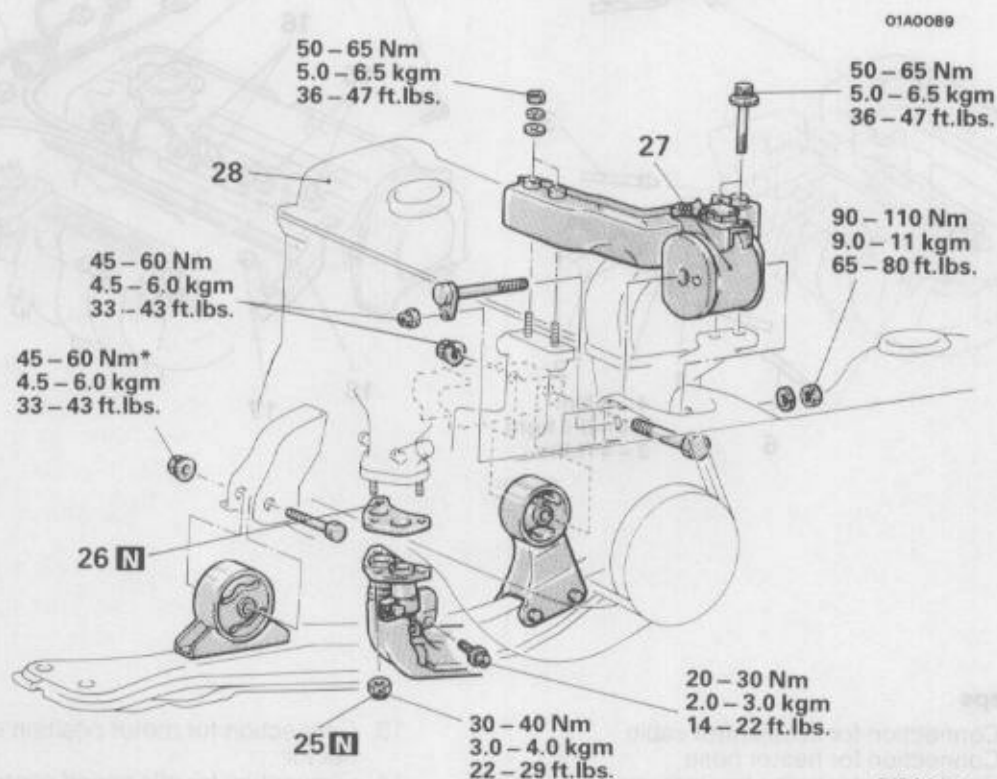
50 – 65 Nm
5.0 – 6.5 kgm
36 – 47 ft.lbs.

50 – 65 Nm
5.0 – 6.5 kgm
36 – 47 ft.lbs.

45 – 60 Nm
4.5 – 6.0 kgm
33 – 43 ft.lbs.

90 – 110 Nm
9.0 – 11 kgm
65 – 80 ft.lbs.

45 – 60 Nm*
4.5 – 6.0 kgm
33 – 43 ft.lbs.



20 – 30 Nm
2.0 – 3.0 kgm
14 – 22 ft.lbs.

30 – 40 Nm
3.0 – 4.0 kgm
22 – 29 ft.lbs.

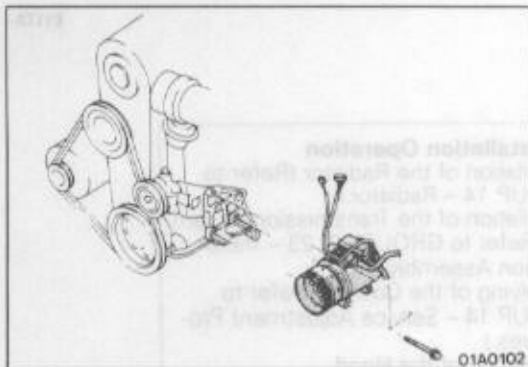
01P0038

Removal steps

19. Alternator connector
20. Connection for oil pressure switch
- ♦♦ 21. Drive belt (Air conditioner)
- ♦♦ 22. Air conditioner compressor
- ♦♦ 23. Drive belt (Power steering)
- ♦♦ 24. Power steering oil pump
25. Self-locking nut
26. Gasket
- ♦♦ 27. Engine mount bracket
- ♦♦ ♦♦ 28. Engine assembly

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ♦♦: Refer to "Service Points of Removal".
- (3) ♦♦♦: Refer to "Service Points of Installation".
- (4) **N**: Non-reusable parts
- (5) The fasteners marked * should be temporarily tightened before they are finally tightened once the total weight of the engine has been placed on the vehicle body.

**SERVICE POINTS OF REMOVAL**

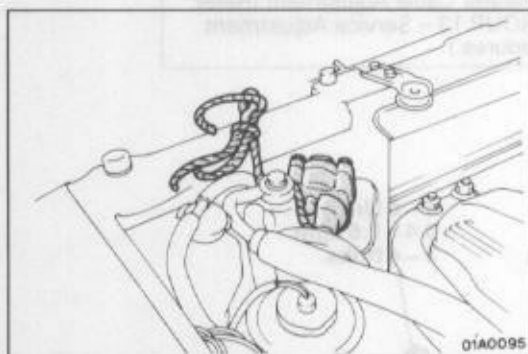
E11TBAB1

22. REMOVAL OF AIR CONDITIONER COMPRESSOR

Disconnect the connection of the air conditioner compressor, and then remove the compressor (with the hose attached) from the compressor bracket.

NOTE

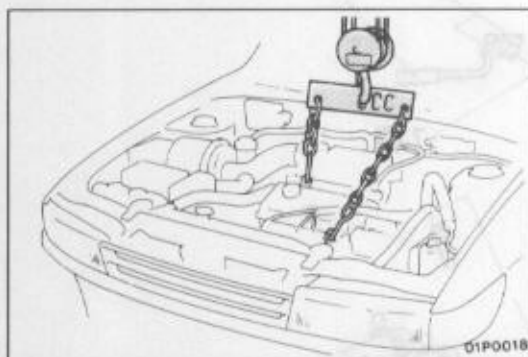
Suspend the removed air conditioner compressor (by using wire or similar material) at a place where it will not be damaged during removal/installation of the engine assembly.

**24. REMOVAL OF POWER STEERING OIL PUMP**

Remove the oil pump (with the hose attached).

NOTE

Suspend the removed oil pump (by using wire or similar material) at a place where it will not be damaged during removal/installation of the engine assembly.

**27. REMOVAL OF ENGINE MOUNT BRACKET**

- (1) Attach wire or similar material to the engine hook, and then suspend (to the extent that there is no slackness of the wire) by using a chain block or similar arrangement.
- (2) Remove the engine mount bracket.

28. REMOVAL OF ENGINE ASSEMBLY

- (1) Check to be sure that all cables, hoses, harness connectors, etc. are disconnected from the engine.
- (2) Lift the chain block slowly to remove the engine assembly upward from the engine compartment.

SERVICE POINTS OF INSTALLATION

E11TDAC1

28. INSTALLATION OF ENGINE ASSEMBLY

When installing the engine assembly, check carefully to be sure that all pipes and hoses are connected, and that none are twisted, damaged, etc.

23. 21. ADJUSTMENT OF DRIVE BELT TENSION

Refer to P.11-14.

1. ADJUSTMENT OF ACCELERATOR CABLE

Refer to GROUP 13 – Service Adjustment Procedures.

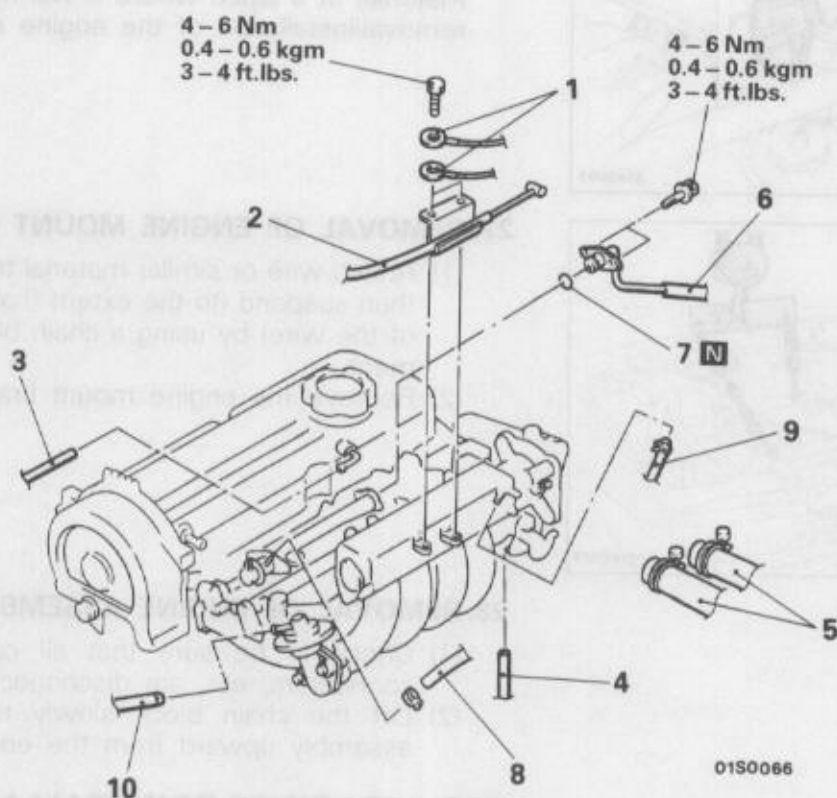
Vehicles built from June 1992 (LANCER - Hatchback)

Pre-removal Operation

- Releasing of Fuel Line Pressure (Refer to GROUP 13 - Service Adjustment Procedures.)
- Removal of the Hood
- Draining of the Coolant (Refer to GROUP 14 - Service Adjustment Procedures.)
- Removal of the Transmission Assembly (Refer to GROUP 22, 23 - Transmission Assembly.)
- Removal of the Radiator (Refer to GROUP 14 - Radiator.)

Post-installation Operation

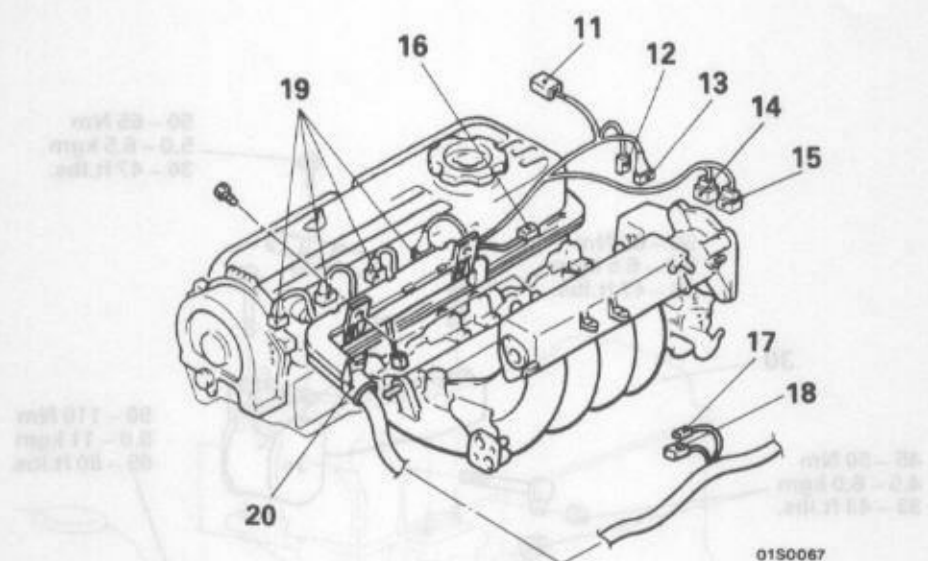
- Installation of the Radiator (Refer to GROUP 14 - Radiator.)
- Installation of the Transmission Assembly (Refer to GROUP 22, 23 - Transmission Assembly.)
- Supplying of the Coolant (Refer to GROUP 14 - Service Adjustment Procedures.)
- Installation of the Hood
- Accelerator Cable Adjustment (Refer to GROUP 13 - Service Adjustment Procedures.)

**Removal steps**

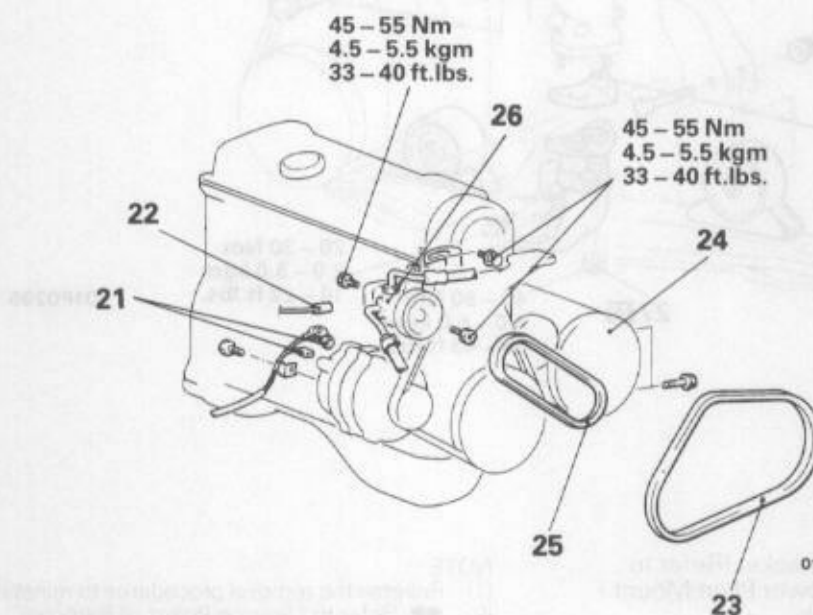
1. Earth cable connection
2. Accelerator cable connection
3. Breather hose connection
4. Vacuum hose connection
5. Heater hose connection
- ◆◆ 6. High-pressure fuel hose connection
7. O-ring
8. Return hose connection
9. Brake booster vacuum hose connection
10. Vacuum hose connection

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆: Refer to "Service Points of Removal".
- (3) ◆◆: Refer to "Service Points of Installation".
- (4) N: Non-reusable parts



01S0067

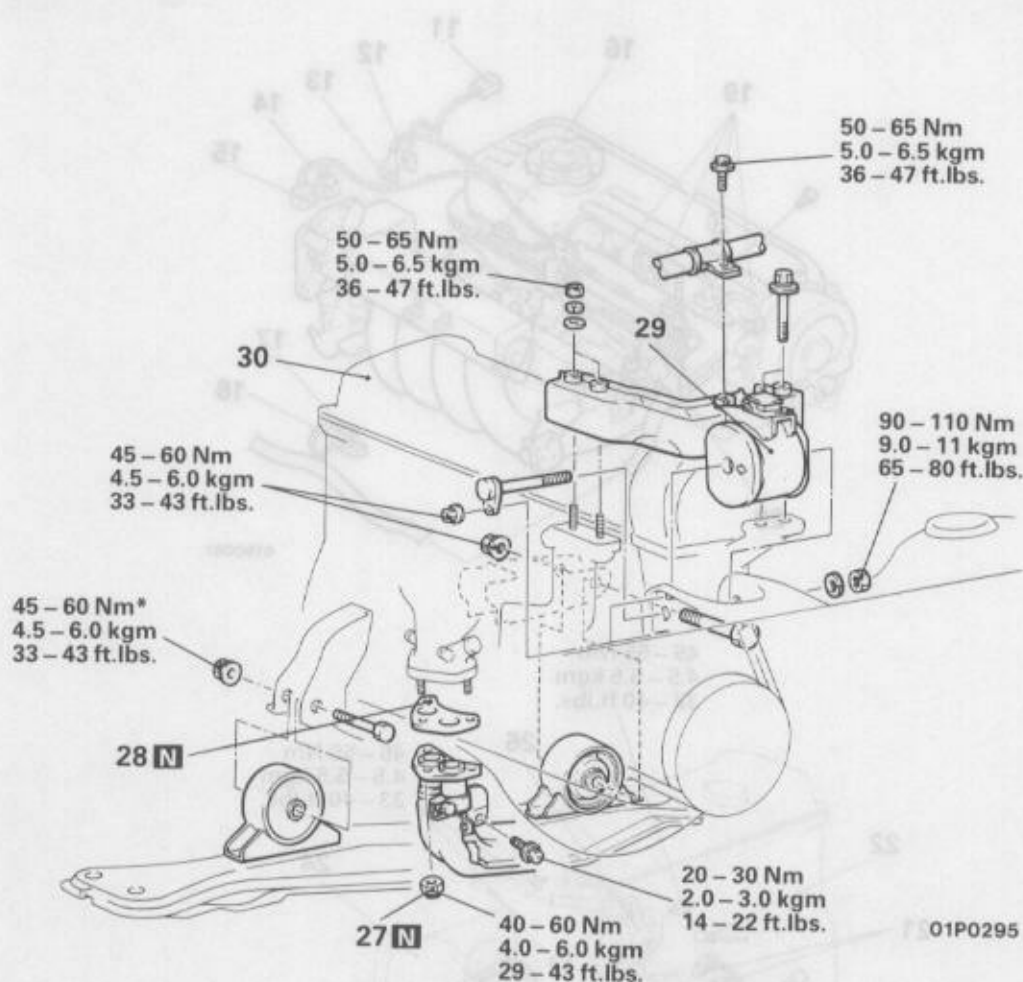


01S0068

11. Oxygen sensor connector
12. Ignition coil connector
13. Crank angle sensor and top dead center sensor connector
14. Engine coolant temperature sensor connector
15. Water temperature gauge unit connector
16. Throttle position sensor connector
17. Idle switch connector
18. Idle speed control connector
19. Injector connector
20. Control harness
21. Alternator connector
22. Power steering oil pressure switch connector
 - Adjustment of V-ribbed belts (Refer to P.11-27.)
23. V-ribbed belt for air conditioner
24. Air conditioner compressor
25. V-ribbed belt for power steering
26. Power steering oil pump

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ♦♦: Refer to "Service Points of Removal".
- (3) ♦♦: Refer to "Service Points of Installation".



27. Self-locking nut

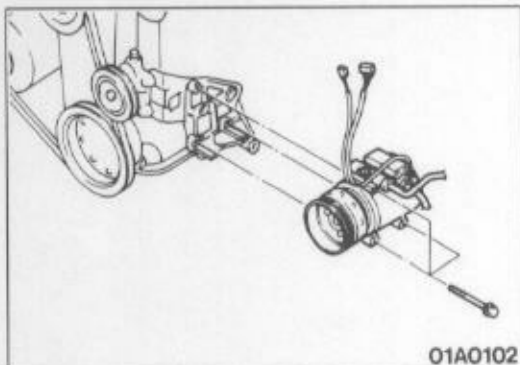
28. Gasket

29. Engine mount bracket (Refer to GROUP 32 – Power Plant Mount.)

30. Engine assembly

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ♦♦♦: Refer to "Service Points of Removal".
- (3) ♦♦♦♦: Refer to "Service Points of Installation".
- (4) N: Non-reusable parts
- (5) The fasteners marked * should be temporarily tightened before they are finally tightened once the total weight of the engine has been placed on the vehicle body.

**SERVICE POINTS OF REMOVAL**

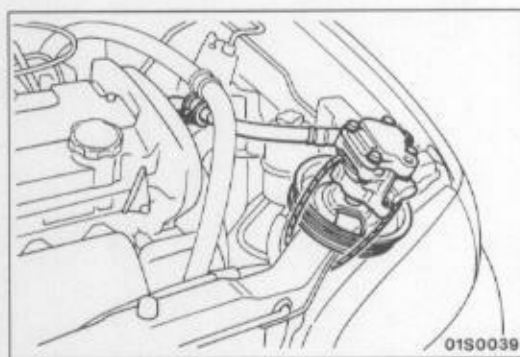
E11TBAQ

**24. REMOVAL OF AIR CONDITIONER COMPRESSOR
<VEHICLES WITH AIR CONDITIONER>**

Disconnect the air conditioner compressor connector and remove the compressor from the compressor bracket with the hose still attached.

NOTE

Place the removed air conditioner compressor in a place where it will not be a hindrance when removing and installing the engine assembly, and tie it with a cord.

**26. REMOVAL OF POWER STEERING OIL PUMP**

Remove the power steering oil pump from the bracket with the hose attached.

NOTE

Place the removed power steering oil pump in a place where it will not be a hindrance when removing and installing the engine assembly, and tie it with a cord.

30. REMOVAL OF ENGINE ASSEMBLY

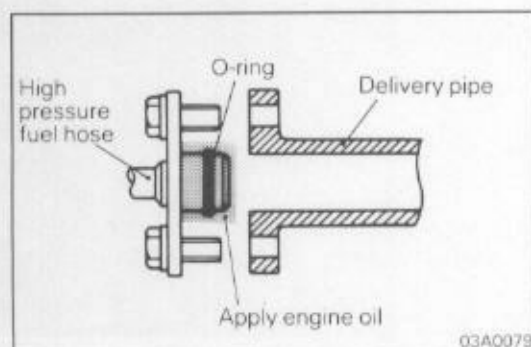
After checking that all cables, hoses and harness connectors, etc., are disconnected from the engine, lift the chain block slowly to remove the engine assembly upward from the engine compartment.

SERVICE POINTS OF INSTALLATION

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30. INSTALLATION OF ENGINE ASSEMBLY

Install the engine assembly while checking to be sure that the cables, hoses, and harness connectors are not clamped.

**6. INSTALLATION OF HIGH PRESSURE FUEL HOSE**

- (1) Apply engine oil to the hose union.
Insert the hose, being careful not to damage the O-ring, and tighten securely.

Caution

Because there is high pressure applied between the fuel pump and the injection mixer, be especially sure that there is no fuel leakage in this area.

SERVICE POINTS OF REMOVAL

24. REMOVAL OF AIR CONDITIONER COMPRESSOR > VEHICLES WITH AIR CONDITIONER <

Disconnect the air conditioner compressor connector and remove the compressor from the compressor bracket with the hose still attached.

NOTE

Place the removed air conditioner compressor in a place where it will not be a hindrance when removing and installing the engine assembly, and tie it with a cord.

25. REMOVAL OF POWER STEERING OIL PUMP

Remove the power steering oil pump from the bracket with the hose attached.

NOTE

Place the removed power steering oil pump in a place where it will not be a hindrance when removing and installing the engine assembly, and tie it with a cord.

30. REMOVAL OF ENGINE ASSEMBLY

After checking that all cables, hoses and harness (wiring) are disconnected from the engine, the engine block assembly is removed from the engine compartment.

SERVICE POINTS OF INSTALLATION

30. INSTALLATION OF ENGINE ASSEMBLY

Install the engine assembly while checking to be sure that the cables, hoses and harness (wiring) are all connected.

6. INSTALLATION OF HIGH PRESSURE FUEL HOSE

(1) Apply engine oil to the hose union. Insert the hose being careful not to damage the O-ring and tighten securely.

Caution

Because there is high pressure applied between the fuel pump and the injection mixer, be especially sure that there is no fuel leakage in this area.

