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PRECAUTIONS AND PREPARATION

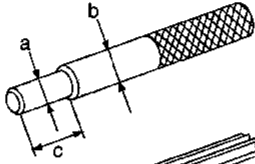
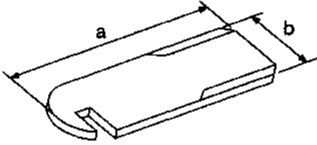

Precaution

WARNING:

After cleaning the clutch disc, wipe it with a dust collector.
Do not use compressed air.

Special Service Tools

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV30101600 (New) KV30101000 (Former) (J33213) Clutch aligning bar	<div style="display: flex; justify-content: space-between;"> <div data-bbox="553 625 602 651">New</div> <div data-bbox="1003 611 1390 636">Installing clutch cover and clutch disc</div> </div>  <div style="display: flex; justify-content: space-between;"> <div data-bbox="553 835 626 856">Former</div> <div data-bbox="1003 867 1279 953"> a: 15.9 mm (0.626 in) dia. b: 17.9 mm (0.705 in) dia. c: 40 mm (1.57 in) </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div data-bbox="430 930 488 951">NT645</div> <div data-bbox="1003 1115 1211 1171"> a: 150 mm (5.91 in) b: 25 mm (0.98 in) </div> </div>
ST20050240 (—) Diaphragm spring adjusting wrench	<div style="display: flex; justify-content: space-between;"> <div data-bbox="1003 980 1451 1037">Adjusting unevenness of diaphragm spring of clutch cover</div> </div>  <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div data-bbox="430 1146 488 1167">NT404</div> <div data-bbox="1003 1115 1211 1171"> a: 150 mm (5.91 in) b: 25 mm (0.98 in) </div> </div>
KV32101000 (J25689-A) Pin punch	<div style="display: flex; justify-content: space-between;"> <div data-bbox="1003 1199 1352 1224">Removing and installing spring pin</div> </div>  <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div data-bbox="430 1318 488 1339">NT410</div> <div data-bbox="1003 1314 1227 1339"> a: 4 mm (0.16 in) dia. </div> </div>

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

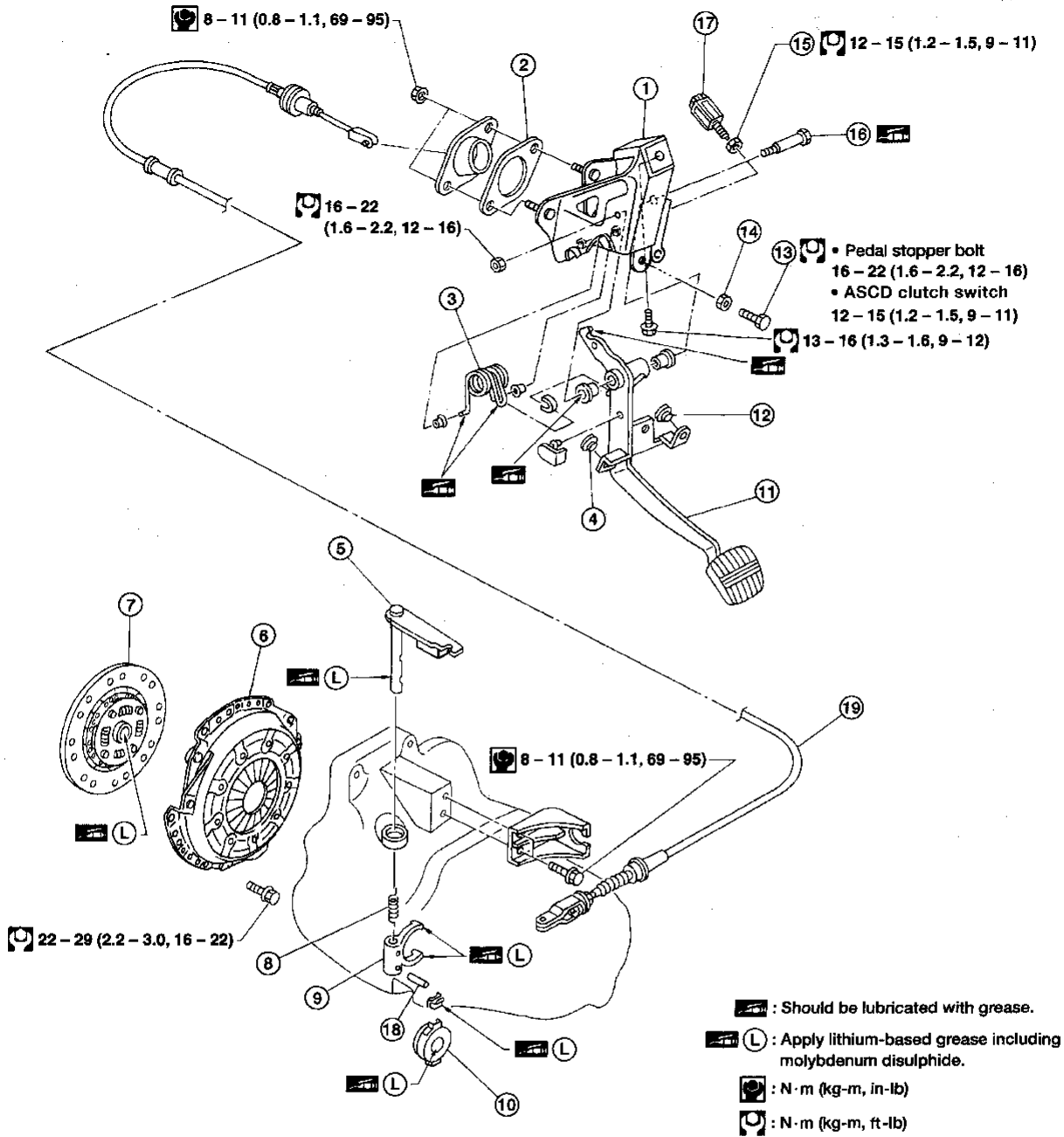
Use the chart below to help you find the cause of the symptom. The numbers indicate the order of inspection. If necessary, repair or replace these parts.

Symptom		SUSPECTED PARTS (possible cause)																		
		CL-5	Refer to EM section	CL-6	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-8	CL-8	CL-8	CL-8	
Reference page		CL-5	Refer to EM section	CL-6	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-7	CL-8	CL-8	CL-8	CL-8	
SUSPECTED PARTS (possible cause)		CLUTCH PEDAL (Free play out of adjustment)	ENGINE MOUNTING (Loose)	RELEASE BEARING (Worn, dirty or damaged)	CLUTCH DISC (Out of true)	CLUTCH DISC (Runout is excessive)	CLUTCH DISC (Lining broken)	CLUTCH DISC (Dirty or burned)	CLUTCH DISC (Oily)	CLUTCH DISC (Worn out)	CLUTCH DISC (Hardened)	CLUTCH DISC (Lack of spline grease)	DIAPHRAGM SPRING (Damaged)	DIAPHRAGM SPRING (Out of tip alignment)	CLUTCH COVER (Distortion)	FLYWHEEL (Distortion)				
Symptom	Clutch grabs/chatters		1			2			2	2	2			2						
	Clutch noisy			1																
	Clutch slips	1							2	2			3			4	5			
	Clutch does not disengage	1			2	2	2	2	2			2	3	3	4					

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CLUTCH SYSTEM

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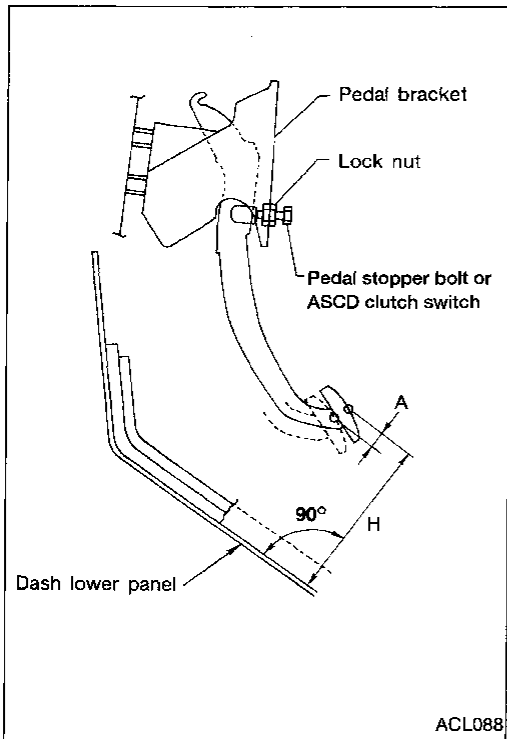
ACL087

- ① Clutch pedal bracket
- ② Insulator
- ③ Assist spring
- ④ Stopper rubber
- ⑤ Withdrawal lever
- ⑥ Clutch cover
- ⑦ Clutch disc

- ⑧ Return spring
- ⑨ Clutch lever
- ⑩ Release bearing
- ⑪ Clutch pedal
- ⑫ Stopper rubber
- ⑬ Pedal stopper bolt or ASCD clutch switch

- ⑭ Lock nut
- ⑮ Lock nut
- ⑯ Fulcrum pin
- ⑰ Clutch interlock switch
- ⑱ Spring pin
- ⑲ Clutch cable

INSPECTION AND ADJUSTMENT



Adjusting Clutch Pedal

1. Adjust pedal height with pedal stopper bolt or ASCD clutch switch.

Pedal height "H":

153 - 163 mm (6.02 - 6.42 in)

2. Adjust withdrawal lever play "B" according to the following procedure.

CAUTION:

When clutch cable is replaced with a new one, fully depress clutch pedal 50 times as a break-in procedure (to pre-stretch the clutch cable). Then, adjust the cable as follows.

- a. Push withdrawal lever by hand until resistance is felt, and then tighten adjusting nut.
- b. Turn back adjusting nut 2.5 to 3.5 turns, and then tighten lock nut.

Withdrawal lever play "B":

2.5 - 3.5 mm (0.098 - 0.138 in)

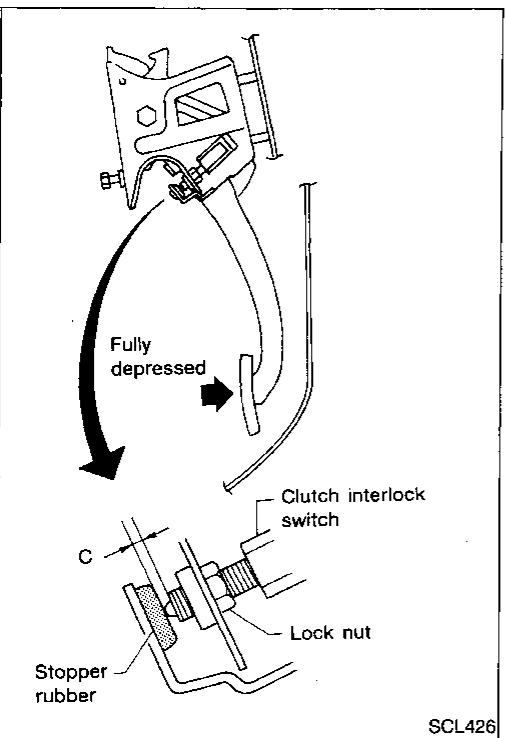
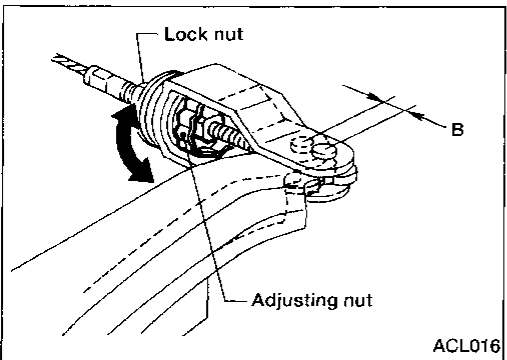
Lock nut:

⊗: 4.3 - 5.9 N·m (0.44 - 0.60 kg·m, 38 - 52 in·lb)

3. As a final check, measure pedal free travel at center of pedal pad.

Pedal free travel "A":

11.0 - 15.0 mm (0.433 - 0.591 in)



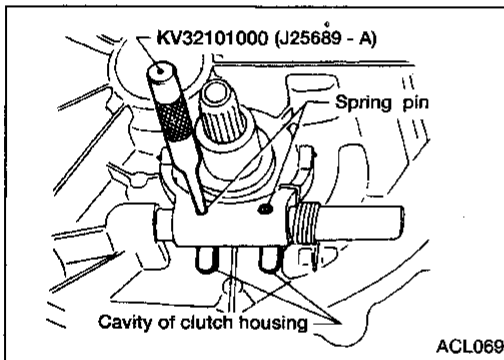
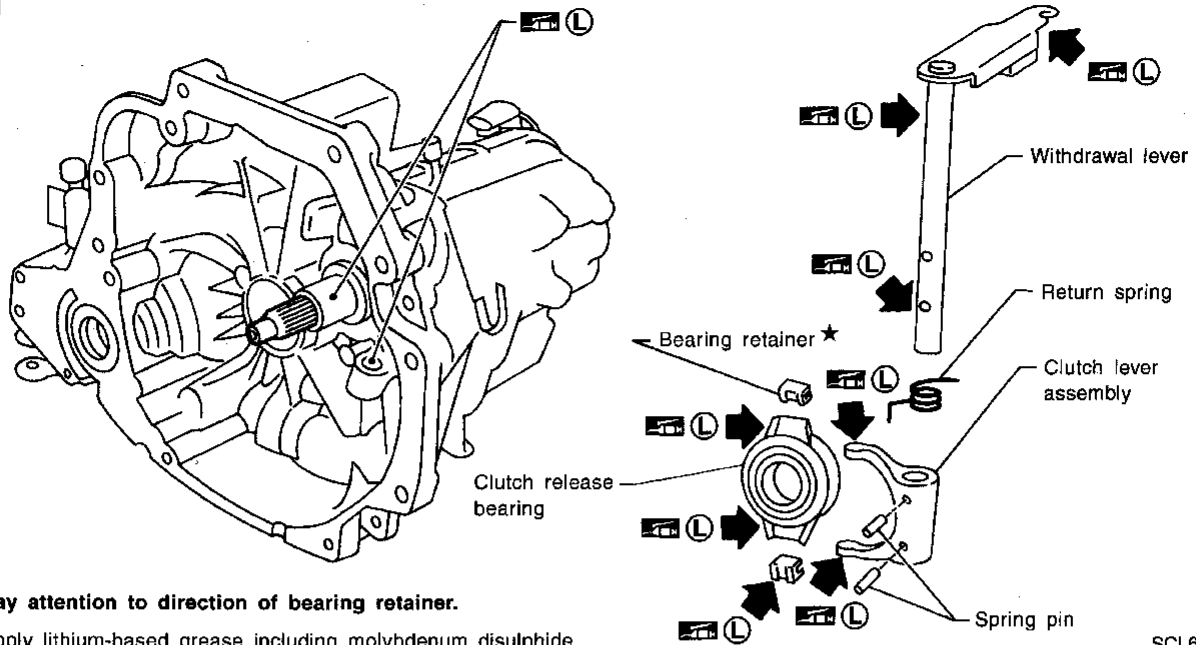
4. Adjust clearance "C" shown in the figure while fully depressing clutch pedal.

Clearance "C":

0.3 - 1.0 mm (0.012 - 0.039 in)

CLUTCH RELEASE MECHANISM

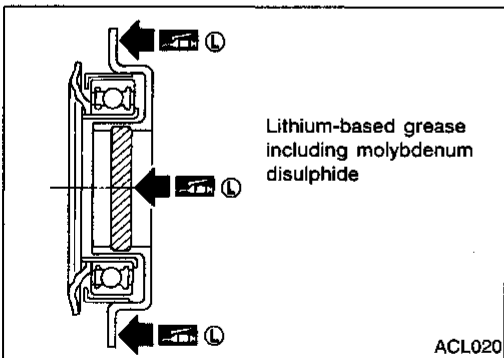
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Clutch Release Mechanism

REMOVAL AND INSTALLATION

- Remove release bearing by pulling bearing retainers outward.
- Align spring pin with cavity of clutch housing and tap out spring pin.
- To install, reverse removal procedure.



INSPECTION

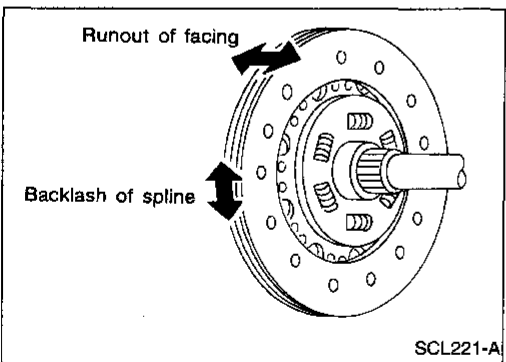
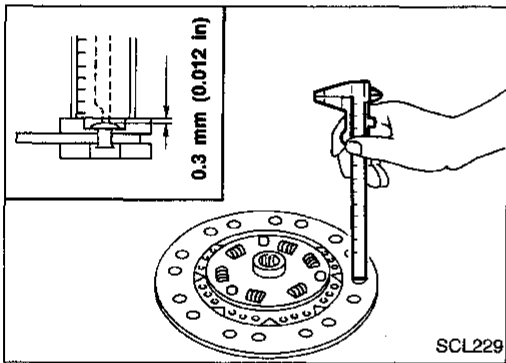
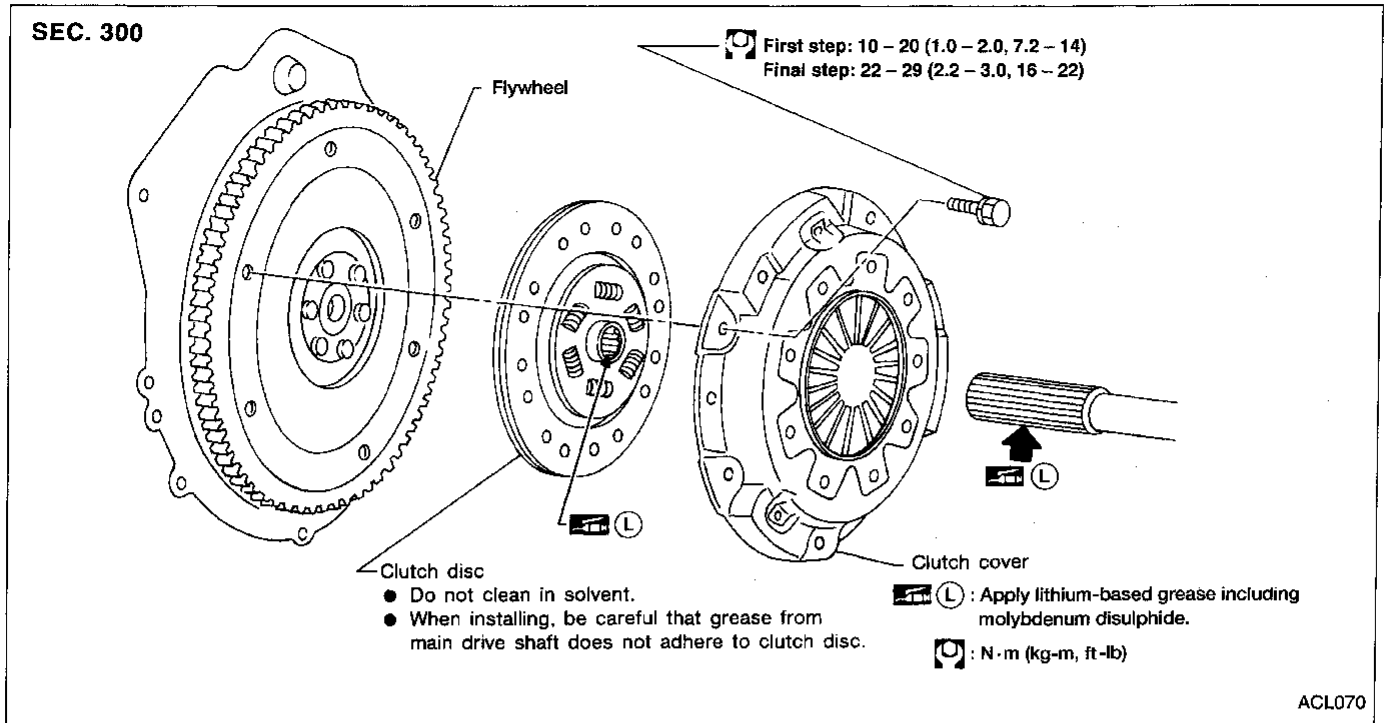
Check the following items, and replace if necessary.

- Release bearing, to see that it rolls freely and is free from noise, cracks, pitting or wear
- Release sleeve and withdrawal lever rubbing surface, for wear, rust or damage

LUBRICATION

- Apply recommended grease to contact surface and rubbing surface.
- Too much lubricant may damage clutch disc facing.

CLUTCH DISC AND CLUTCH COVER



Clutch Disc

INSPECTION

Check the following items, and replace if necessary.

- Clutch disc, for burns, discoloration, oil or grease leakage
- Clutch disc, for wear of facing

Wear limit of facing surface to rivet head:
Model 190, 215 0.3 mm (0.012 in)

- Clutch disc, for backlash of spline and runout of facing
Maximum backlash of spline (at outer edge of disc):

Model 190 0.8 mm (0.031 in)

Model 215 0.9 mm (0.035 in)

Runout limit:

Model 190, 215 1.0 mm (0.039 in)

Distance of runout check point (from hub center):

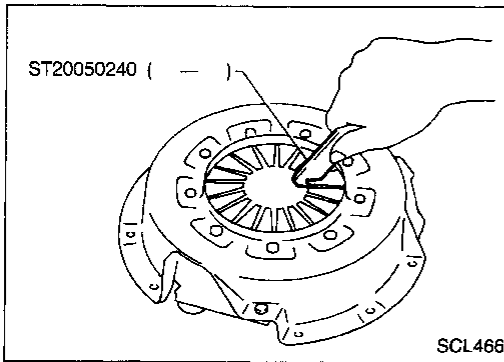
Model 190 90 mm (3.54 in)

Model 215 102.5 mm (4.04 in)

INSTALLATION

- Apply recommended grease to contact surface of splines.
- Too much lubricant may damage clutch disc facing.

CLUTCH DISC AND CLUTCH COVER



Clutch Cover and Flywheel

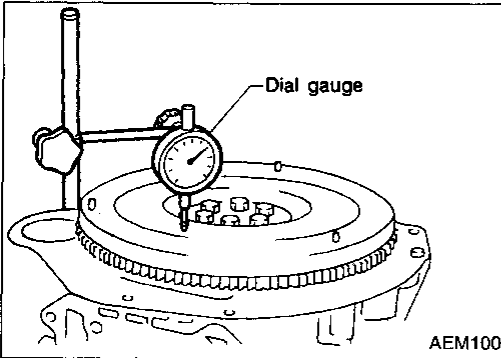
INSPECTION AND ADJUSTMENT

- Check clutch cover while installed on vehicle for uneven diaphragm spring toe height.

Uneven limit:

Model 190, 215 0.7 mm (0.028 in)

- If out of limit, adjust the height with Tool.



FLYWHEEL INSPECTION

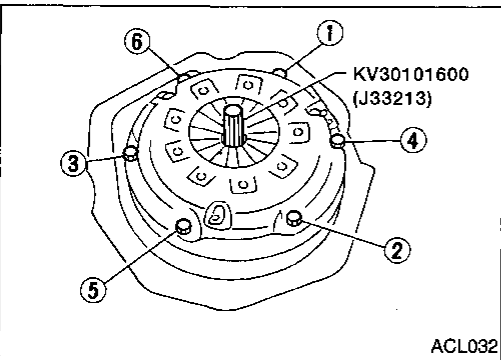
CAUTION:

Do not allow any magnetic materials to contact the ring gear teeth.

- Inspect contact surface of flywheel for slight burns or discoloration. Clean flywheel with emery paper.
- Check flywheel runout.

Maximum allowable runout:

Refer to EM section ("Inspection", "CYLINDER BLOCK").



INSTALLATION

- Insert Tool into clutch disc hub when installing clutch cover and disc.
- Be careful not to allow grease to contaminate clutch facing.
- Tighten bolts in numerical order, in two steps.

First step:

☐: 10 - 20 N·m (1.0 - 2.0 kg·m, 7.2 - 14 ft·lb)

Final step:

☐: 22 - 29 N·m (2.2 - 3.0 kg·m, 16 - 22 ft·lb)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

CLUTCH CONTROL SYSTEM

Type of clutch control	Mechanical type
------------------------	-----------------

CLUTCH DISC

Unit: mm (in)

Engine	GA16DE	SR20DE
Model	190	215
Facing size (Outer dia. x inner dia. x thickness)	190 x 132 x 3.5 (7.48 x 5.20 x 0.138)	215 x 140 x 3.5 (8.46 x 5.51 x 0.138)
Thickness of disc assembly with load	7.6 - 8.0 (0.299 - 0.315) with 3,825 N (390 kg, 860 lb)	7.6 - 8.0 (0.299 - 0.315) with 3,923 N (400 kg, 882 lb)

CLUTCH COVER

Engine	GA16DE	SR20DE
Model	190	215
Full-load N (kg, lb)	3,825 (390, 860)	4,413 (450, 992)

Inspection and Adjustment

CLUTCH PEDAL

Unit: mm (in)

Engine	GA16DE, SR20DE
Pedal height "H" ¹	153 - 163 (6.02 - 6.42)
Pedal free travel "A" (at pedal pad)	11.0 - 15.0 (0.433 - 0.591)
Withdrawal lever play "B"	2.5 - 3.5 (0.098 - 0.138)
Clearance "C" (between pedal stopper rubber and clutch inter- lock switch) ²	0.3 - 1.0 (0.012 - 0.039)

¹: Measured from surface of dash lower panel to surface of pedal pad.

²: Clutch pedal fully depressed.

CLUTCH COVER

Unit: mm (in)

Engine	GA16DE	SR20DE
Model	190	215
Diaphragm spring height	29.7 - 31.7 (1.169 - 1.248)	30.5 - 32.5 (1.201 - 1.280)
Uneven limit of diaphragm spring toe height	0.7 (0.028)	

CLUTCH DISC

Unit: mm (in)

Engine	GA16DE	SR20DE
Model	190	215
Wear limit of facing surface to rivet head	0.3 (0.012)	
Runout limit of facing	1.0 (0.039)	
Distance of runout check point (from hub center)	90 (3.54)	102.5 (4.04)
Maximum backlash of spline (at outer edge of disc)	0.8 (0.031)	0.9 (0.035)