SECTION CL

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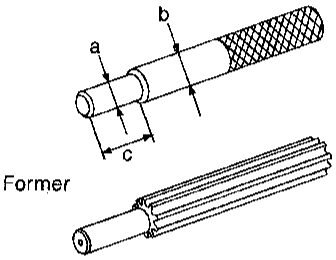
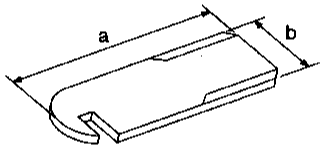
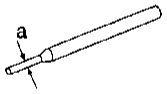
Precaution

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	New  NT645	Installing clutch cover and clutch disc **a: 15.9 mm (0.626 in) dia.** **b: 17.9 mm (0.705 in) dia.** **c: 40 mm (1.57 in)**
ST20050240 (—) Diaphragm spring adjusting wrench	 NT404	Adjusting unevenness of diaphragm spring of clutch cover **a: 150 mm (5.91 in)** **b: 25 mm (0.98 in)**
KV32101000 (J25689-A) Pin punch	 NT410	Removing and installing spring pin **a: 4 mm (0.16 in) dia.**

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.

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-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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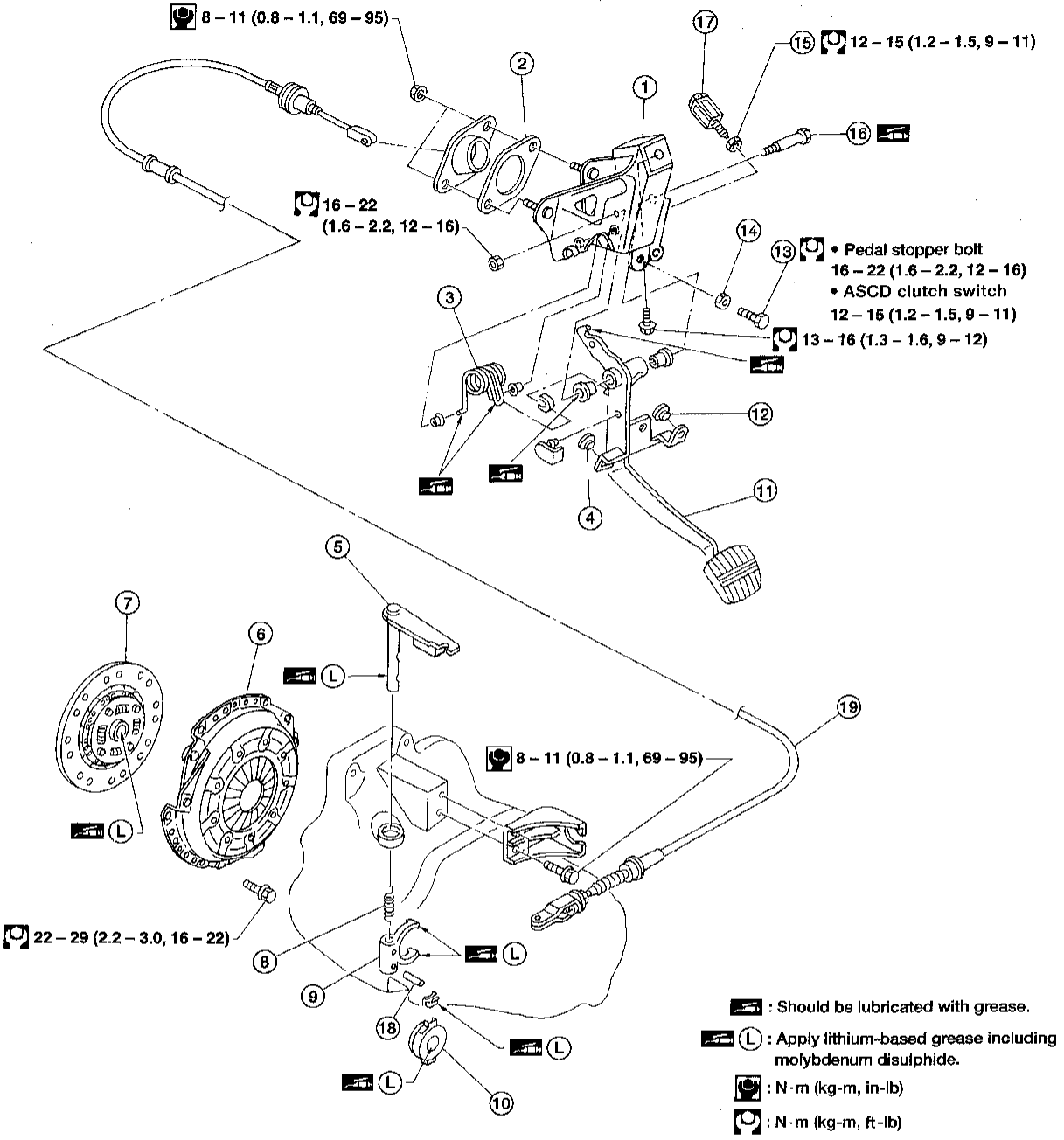
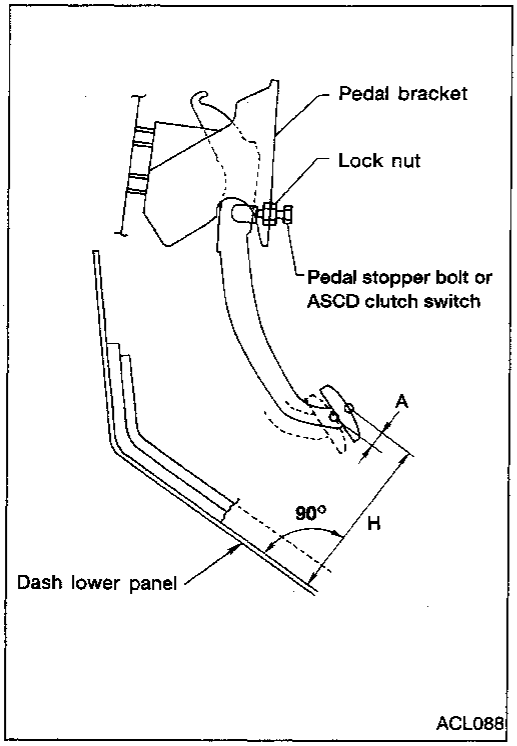


ACL087

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

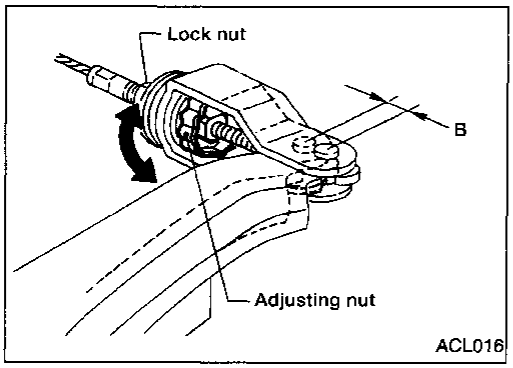


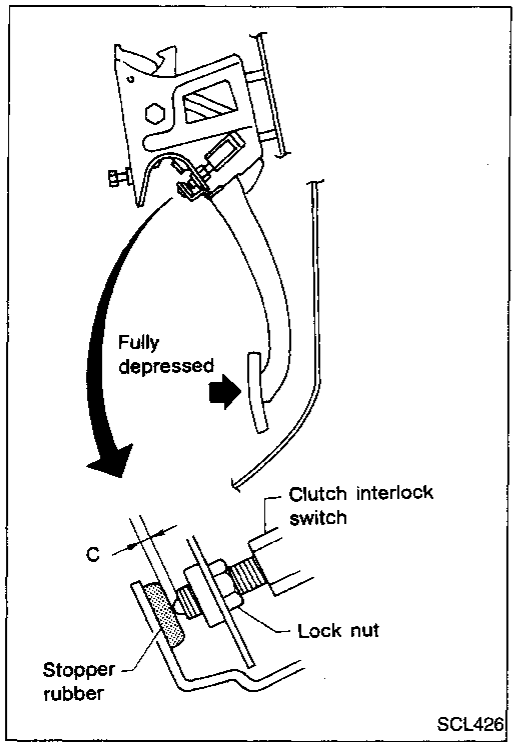
Adjusting Clutch Pedal

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.

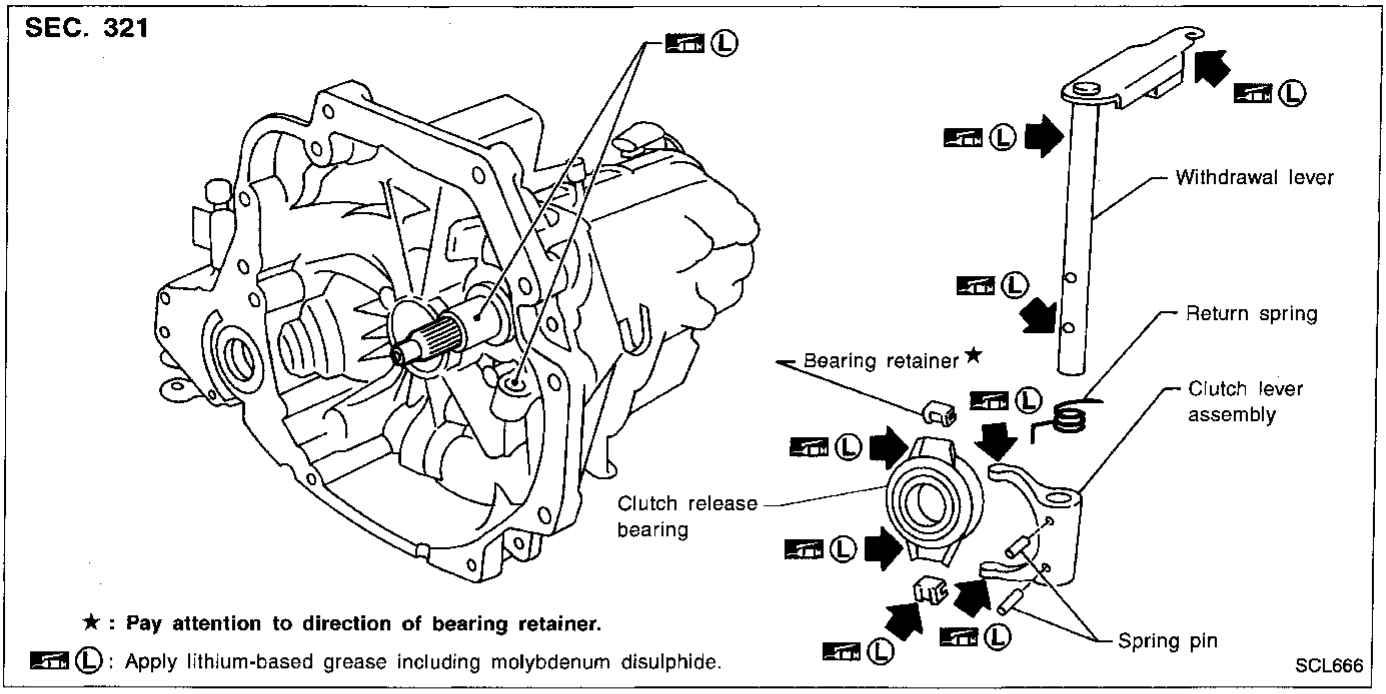
CAUTION:
When clutch cable is replaced with a new one, fully depress clutch pedal 50 times as a break-in procedure (to pre-stretch the clutch cable). Then, adjust the cable as follows.

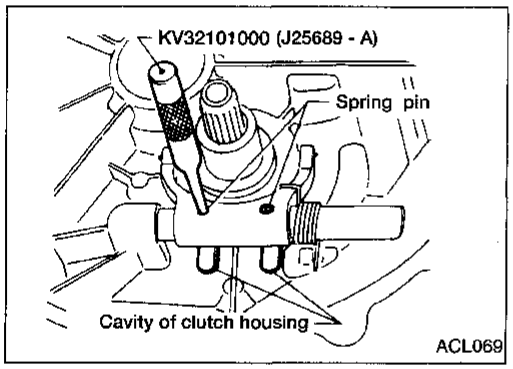
a. Push withdrawal lever by hand until resistance is felt, and then tighten adjusting nut.
b. Turn back adjusting nut 2.5 to 3.5 turns, and then tighten lock nut.
   Withdrawal lever play "B":
   2.5 - 3.5 mm (0.098 - 0.138 in)
   Lock nut:
   : 4.3 - 5.9 N·m (0.44 - 0.60 kg-m, 38 - 52 in-lb)
3. As a 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)

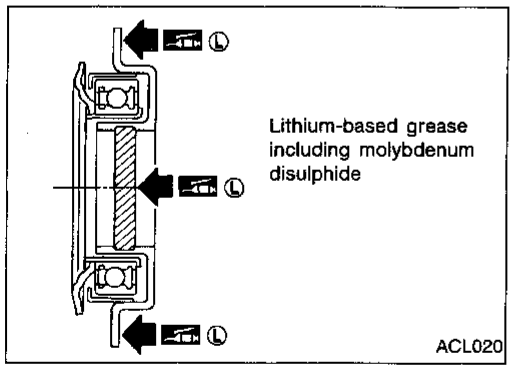




4. Adjust clearance "C" shown in the figure while fully depressing clutch pedal.
   Clearance "C":
   0.3 - 1.0 mm (0.012 - 0.039 in)







Clutch Release Mechanism

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.

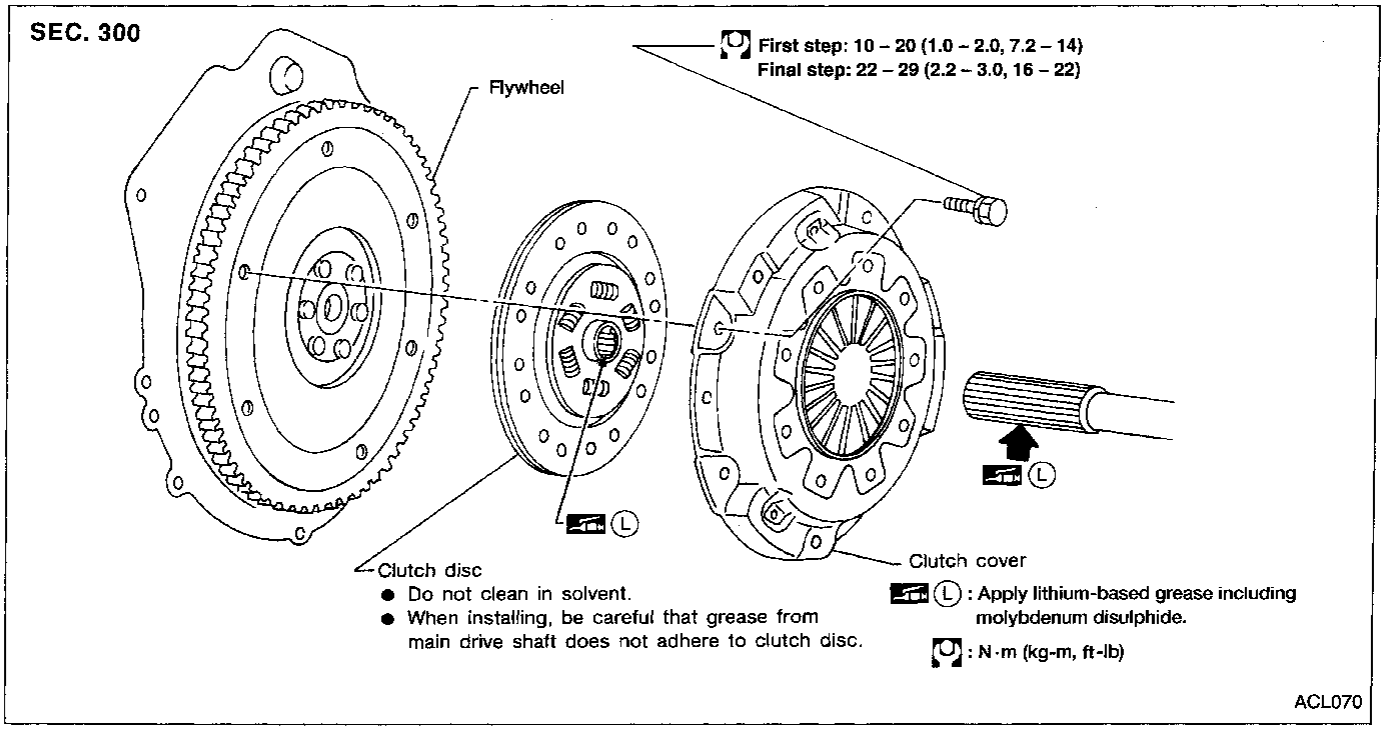
INSPECTION

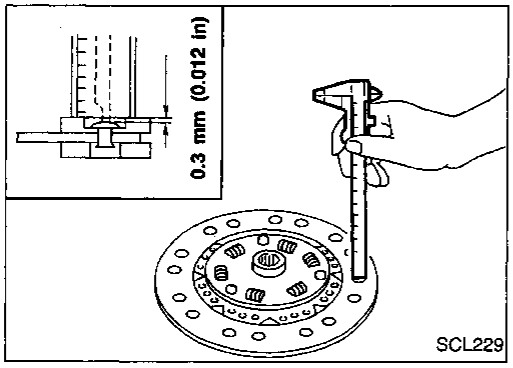
Check the following items, and replace if necessary.

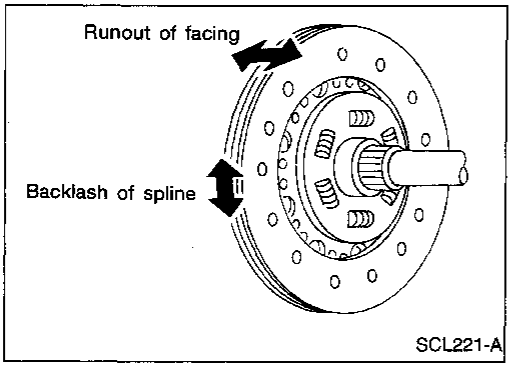
- Release bearing, to see that it rolls freely and is free from noise, cracks, pitting or wear
- Release sleeve and withdrawal lever rubbing surface, for wear, rust or damage

LUBRICATION

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







Clutch Disc

INSPECTION

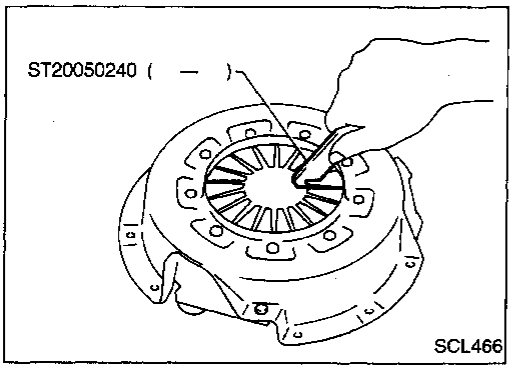
Check the following items, and replace if necessary.

- 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

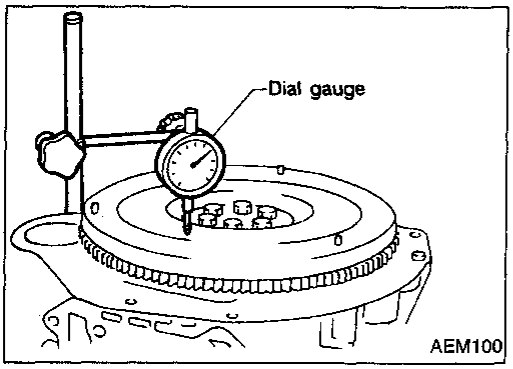
- Apply recommended grease to contact surface of splines.
- **Too much lubricant may damage clutch disc facing.**



Clutch Cover and Flywheel

INSPECTION AND ADJUSTMENT

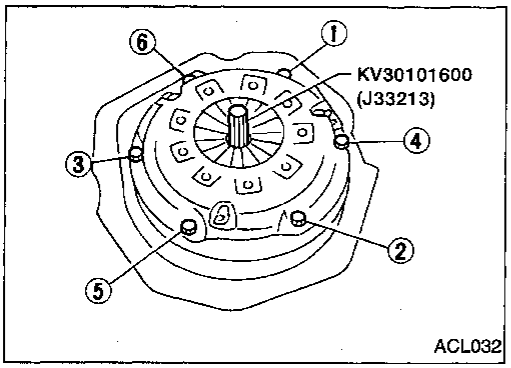
- Check clutch cover while installed on vehicle for uneven diaphragm spring toe height.
  Uneven limit:
  Model 190, 215 0.7 mm (0.028 in)
- If out of limit, adjust the height with Tool.



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)

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 interlock 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)