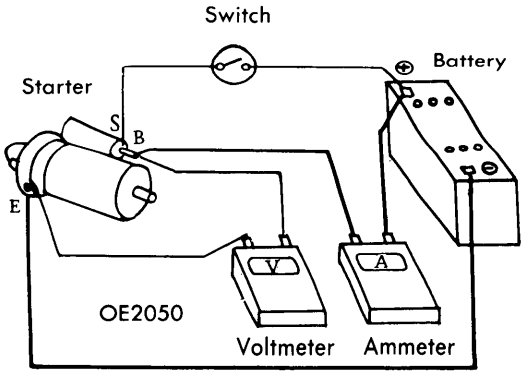
HITACHI & MITSUBISHI

Dodge Colt (1971-73)
Plymouth Cricket (1972)
Datsun (1963-73)
Honda (1971-72)
Chevrolet LUV (1972-73)
Mazda (1971-73)

DESCRIPTION

Starter is a 12-volt, four-pole unit of conventional design. Magnetic switch assembly is mounted on gear case. Starters have a overrunning clutch connected by a shift lever to magnetic switch plunger. Brushes and springs are retained inside yoke assembly by holders.



NO LOAD TEST HOOK-UP

APPLICATION

Model	① Hitachi Part No.
Datsun (All Models)	
1963-73	71, 72, 87L, 87M, 88, 91, 92 103, 103P, 121, 122, 122N 126M, 156, 182
Honda (1971-72)	111-112
LUV (1972-73)	118

① — Part numbers have S 114 prefix. (Example — S 114-118).

Model	Mitsubishi Part No.
Datsun	
PL 312 (1963-64)	MA 0.8/12
320 Pickup (1964-65)	MP 12QR
2000 Roadster (1968-70)	ME-Y2R
Dodge Colt	
1971-72	MED 03
1973	MED 03-1
Plymouth Cricket (1972)	MEB 02-0
Mazda (1971-73)	
1200	0259 18 400A
616	0222 18 400A
618, 808, B-1600 Pickup	0222 18 400B
R-100	0845 18 400, 2329 18 400 0839 18 400C
RX-2	0845 18 400, 0839 18 400C 0839 18 400B, 2869 18 400
RX-3	0845 18 400, 0866 18 400A 2869 18 400

TESTING

PERFORMANCE TESTS

No Load Tests — Connect starter in series with a 12 volt battery, being certain ammeter used is capable of 1000 ampere reading. Connect voltmeter to starter (see illustration). Compare readings with specifications.

Lock (Torque) Test — Mount starter in a test stand to allow starter torque measurement (follow manufacturers instructions). With voltage adjusted (see specifications), ammeter reading and starter torque should be within specifications.

OVERHAUL

DISASSEMBLY

1) Loosen nut securing connecting plate to magnetic switch "M" terminal, remove screws securing magnetic switch and remove switch assembly. Remove two through bolts and brush cover assembly, then tap yoke assembly with a wooden hammer and remove it. Remove armature assembly shift lever.

2) Remove pinion stop ring from end of armature shaft by pushing stop ring to the clutch side. Remove snap ring and then remove stop ring with overrunning clutch. Remove overrunning clutch assembly from armature shaft.

PARTS REPLACEMENT & TESTING

Brushes & Springs — Check brush spring tension using a suitable spring scale (see specifications). Check brush contact surface condition. If brush contact is loose, replace brush. If brush height is less than .374" (Datsun with manual transmission), .453" (Colt), or .50" (LUV and all other Datsuns), replace brushes. On Mazda models, brush is allowed 33% wear before replacement is required. Check lead clip and wire connection, check condition of brush holders and spring clip, repair or replace parts as necessary.

Brush Spring Tension

Application	Tension
Colt & Cricket	
1971-72	56 oz. (1.6 kg)
1973	48 oz. (1.3 kg)
Datsun	
2000 Roadster	34 oz. (.9 kg)
240Z (1970-71)	28 oz. (.8 kg)
240Z (1972-73)	56 oz. (1.6 kg)
All Others (1963-72)	28 oz. (.8 kg)
All Others (1973)	50 oz. (1.4 kg)
Honda (1971-72)	28 oz. (.8 kg)
LUV (1971-73)	28 oz. (.8 kg)
Mazda	
1971-72	38 oz. (1.0 kg)
1973	56 oz. (1.6 kg)

Armature — Check external condition of armature. Measure shaft for distortion or bending, using a dial indicator gauge. Replace armature shaft if bending exceeds .0031" on Datsun, .006" on Luv and .004" on all other models.

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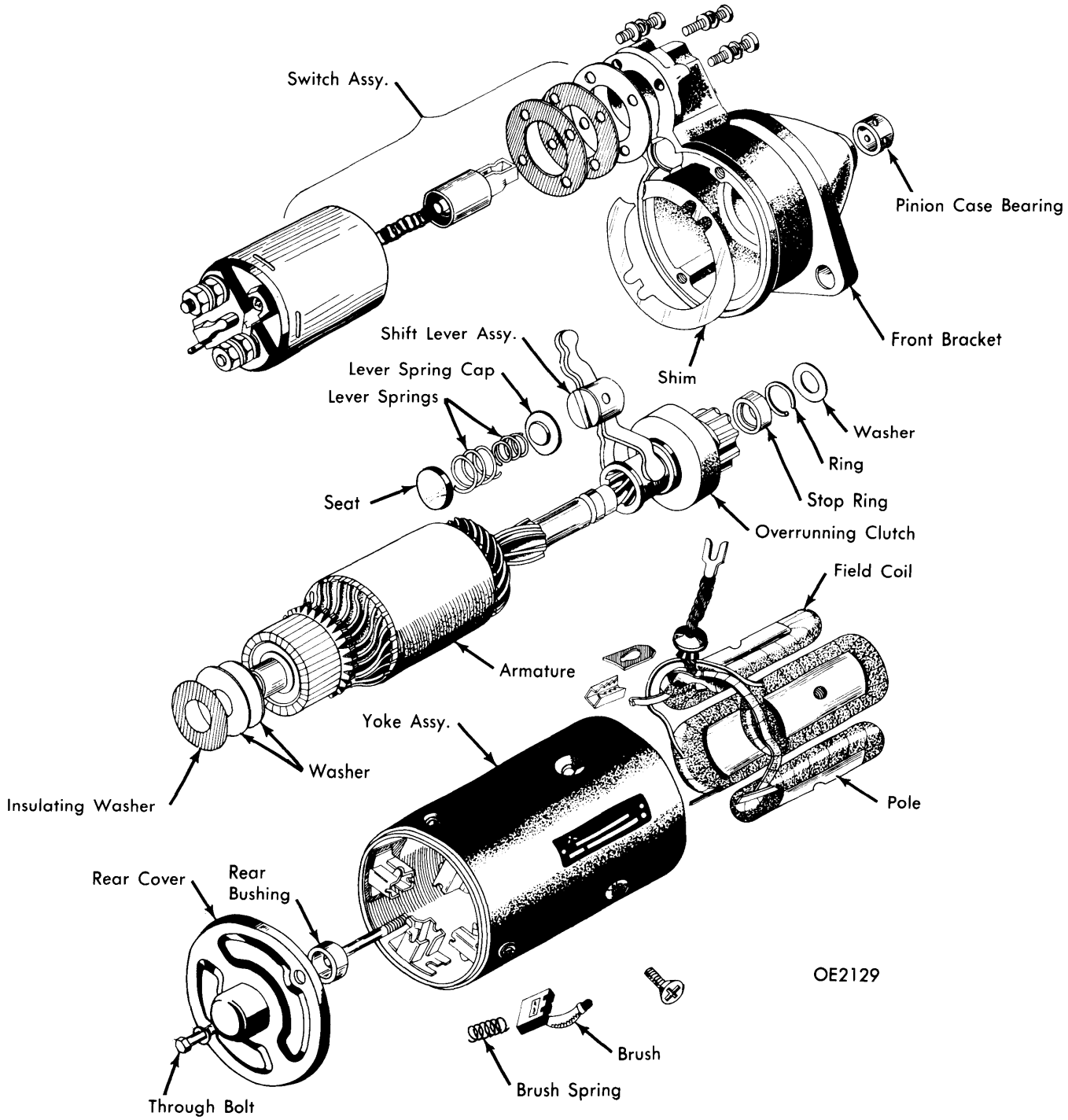
HITACHI & MITSUBISHI (Cont.)



MITSUBISHI STARTER (TYPICAL)

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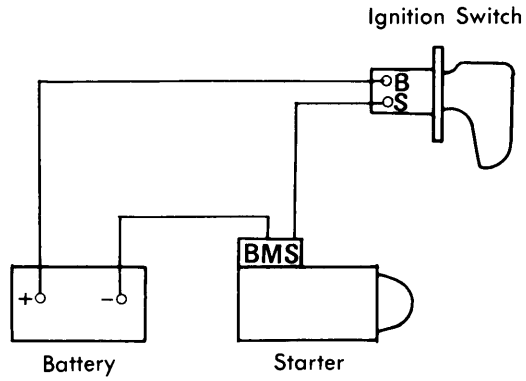
HITACHI & MITSUBISHI (Cont.)

Commutator – Inspect commutator for roughness, if surface is pitted or grooved, it should be sanded lightly with no. 500 emery paper. Also check commutator for being out-of-round. If out-of-round is more than .0079", or insulating mica depth is less than .0079" from the cummutator surface, turn commutator in a lathe until out-of-round is less than .002". Insulating mica should be undercut to depth of .0197-.0315". Wear limit of commutator diameter is .0787", if excessively worn, it must be replaced.

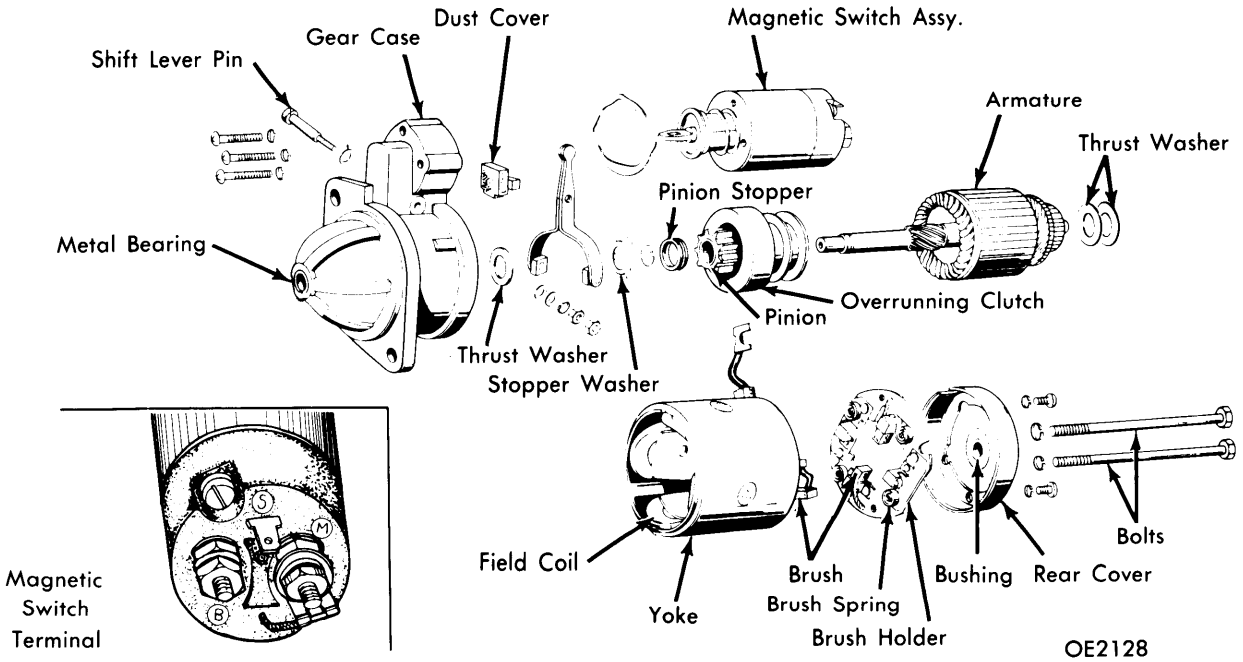
Field Coil – Check field coil continuity by connecting test probe of a circuit tester or a resistance counter to the field coil positive terminal and positive brush holder, if tester shows no continuity, field circuit or coil is open. Check for grounded field coils by placing one probe of a circuit tester on yoke and other probe to field coil positive terminal, if resistance is read, field coils are grounded.

Overrunning Clutch Assembly – Inspect pinion assembly and sleeve. Sleeve should slide freely along armature shaft spline and if damage or resistance is noted, replace assembly. Inspect pinion teeth for excessive rubbing, replace as necessary. Check flywheel ring gear for damage or wear.

Magnetic Switch Assembly – After checking starter motor, magnetic switch assembly should also be checked. Connect jumper cables between negative battery terminal and starting motor "M" terminal, and positive battery terminal and starting motor "S" terminal, connecting ignition switch in series (see illustration). With ignition switch on, measure distance between the pinion front edge and pinion stopper (see illustration). Clearance should be .012-.059" on Hitachi starters and .02-.08" on Mitsubishi starters. If not within specifications, adjust by changing washer between magnetic switch and gear case on all models except Hitachi starter S 114 87L. On starter S 114 87L, depress switch plunger and measure distance between adjusting nut and magnetic switch cover. If not within specifications (1.248-1.272"), adjust by loosening nut and turning plunger until measurement is within specifications.



MAGNETIC SWITCH ASSEMBLY TEST CIRCUIT



HITACHI STARTER (TYPICAL)

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HITACHI & MITSUBISHI (Cont.)

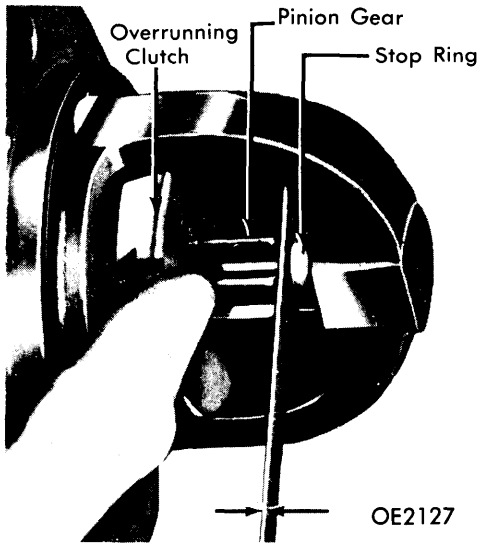
Pinion Case Bearing – Inspect bearing for wear and check side play. Clearance between bearing and armature shaft should not exceed .0079". If limit is exceeded, replace bearing. Clearance with new bearing installed should be .001-.004" on Hitachi starters and .002-.004" on Mitsubishi starters. *NOTE – Be sure bearing is installed so that end of bearing is flush with gear case end plane.*

CLEANING & INSPECTION

Clean all disassembled parts, being careful not to use a grease dissolving solvent on overrunning clutch, armature assembly, magnetic switch assembly or field coils, as damage could result. Check all parts for damage or excessive wear, replace as required.

REASSEMBLY

To reassemble, reverse disassembly procedure and be certain to fill rear case with grease and to lightly oil rear cover metal bearing and pinion.



MEASURING PINION EDGE-TO-PINION STOPPER CLEARANCE

STARTER PERFORMANCE SPECIFICATIONS

Model	No Load Test ①		Lock Test		
	Amps.	RPM	Amps.	Volts	Torque
HITACHI					
S 114-71	.....	....	below 500	9.5	over 6.51 ft. lbs.
S 114-72	.....	....	below 500	9.5	over 6.51 ft. lbs.
S 114-87L	below 60	7000	below 420	6.3	over 6.5 ft. lbs.
S 114 87M	below 60	7000	below 420	6.3	over 6.5 ft. lbs.
S 114-88	below 60	6000	below 420	6.0	over 7.23 ft. lbs.
S 114-91	.....	....	below 500	9.5	over 6.51 ft. lbs.
S 114-92	below 60	7000	.....	...	.....
S 114-103	below 60	7000	below 480	6.0	over 7.95 ft. lbs.
S 114 103P	below 60	7000	below 430	6.0	.....
S 114-118	below 60	6000	below 330	5.1	over 5.8 ft. lbs.
S 114-121	below 60	7000	below 460	6.0	over 8.3 ft. lbs.
S 114-122	below 60	5000	below 460	6.0	over 10.1 ft. lbs.
S 114-122N	below 60	5000	below 460	6.0	.....
S 114-126M	below 60	7000	below 430	6.0	.....
S 114 156	below 60	6000	below 420	6.3	over 7.2 ft. lbs.
S 114 182	below 60	6000	below 500	5.0	.....
S 114-111-112	below 60	700	below 460	6.0	over 7.95 ft. lbs.
MITSUBISHI					
MA 0.8/12	.....	....	.....	...	.....
MP 12 QR	.....	....	below 500	9.5	over 6.5 ft. lbs.
MED 03-1	below 55	5500	below 500	6.0	over 11.6 ft. lbs.
MEB 02-0	.....	....	.....	...	.....
ME-Y2R	below 60	6000	below 500	6.0	over 7.23 ft. lbs.
MED03	below 55	5500	below 500	6.0	over 11.2 ft. lbs.
0 222 18 400A	below 60	6000	below 560	7.5	over 9.5 ft. lbs.
0 222 18 400B	below 60	6000	below 560	7.5	over 9.5 ft. lbs.
0 259 18 400A	below 60	3700	below 560	7.5	over 9.5 ft. lbs.
0 839 18 400B	below 70	3600	below 60	6.0	over 19.5 ft. lbs.
0 839 18 400C	below 70	3600	below 60	6.0	over 19.5 ft. lbs.
0 845 18 400	below 70	3600	below 60	6.0	over 19.5 ft. lbs.
2 329 18 400	below 70	3600	below 60	6.0	over 19.5 ft. lbs.
0866 18 400A	below 70	3600	below 600	6.0	over 19.5 ft. lbs.
2 869 18 400	below 70	3600	below 60	6.0	over 19.5 ft. lbs.

① – At 12–volts.

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