MAZDA RX-3

SPORT KIT MANUAL

TOYOKOGYO CO., LTD.

How to use this book

Basic Book Structure

This RX-3 SPORT KIT MANUAL deals with machining, changes and assembling of all sport kits for the RX-3. Explanation is given on how to make the modifications required for higher performance in competition running. It is our hope that this manual will lead to births of excellent tune-up versions of this model.

COMPONENTS OF RX-3 SPORTS KIT

1–A. ENGINE KIT

1–A–1. Intake Kit Common for Stage–1, 2 and 3

Description	Part No.	Q'ty
Intake Manifold	0870 78 200A	1
Gasket	0870 78 205	1
Gasket	0822 78 229	4
Carburettor	0822 78 215	1
Jet Set, Carburettor	0870 78 215	1
Fuel Pipe	0822 78 211	1
Supporter	0822 78 220	2
Bracket, Accel, Wire	0870 78 203	1
Nut	99901 0800	8
Plain Washer	99952 0800	8
Spring Washer	99971 0800	8
Air Cleaner	0839 78 220	1
Air Horn	0839 78 230	2
Nut	99906 0500	6
Spring Washer	99971 0500	6
Metering Oil Tube	0822 78 370	1
Connector	0822 78 384	1
Plate	0822 78 385	1
Lever	0822 78 386	1
Vacuum Control Tube	0822 78 447	1
Vacuum Control Tube	0822 78 448	2
Pipe	0844 18 590	1

1–A–2. Exhaust Kit for Stage–2 and 3

Description	Part No.	Q'ty
Exhaust Manifold	0870 78 250A	1
Gasket	0839 78 298	2
Holder (5-forward T/M use)	0870 78 255	1
Holder (4-forward T/M use)	0870 78 265	1
Nut	99901 0800	2
Spring Washer	99971 0800	2
Exhaust Pipe	0870 78 260	1
Gasket	0839 78 299	1
Bolt	99801 1034	3
Nut	99901 1000	3
Spring Washer	99971 1000	3
Silencer Hanger	0727 40 060	2
Plain Washer	0603 40 063A	2
Nut	99901 0800	2
Spring Washer	99971 0800	2

1–A–3. Rotating Kit for Stage–3

Description	Part No.	Q'ty
Rotor Housing	0870 78 101	2
Rotor Ass'y, Front	0870 78 110	1
Rotor Ass'y, Rear	0870 78 120	1
Apex Seal	0870 78 171	6
Spacer, 8.00 mm (0.315 in)	0822 78 155	
Spacer, 8.02 mm (0.316 in)	0822 78 156	1
Spacer, 8.04 mm (0.317 in)	0822 78 157	
Spacer, 8.06 mm (0.318 in)	[illegible]	
Needle bearing	[illegible]	2
Oil Seal, Inner	[illegible]	4
Oil Seal, outer	[illegible]	4
Spring, Oil Seal Inner	[illegible]	4
Spring, Oil Seal Outer	[illegible]	4
"O" Ring	[illegible]	2
Blind Plug	[illegible]	1
Oil Seal	[illegible]	2
Needle Bearing	[illegible]	1
Balance Ass'y (4-T/Muse)	[illegible]	1
Balance Ass'y (5-T/Muse)	[illegible]	1

1–A–4. Electric Kit for Stage–2 and 3 (Applicable to Stage–1, too)

Description	Part No.	Q'ty
Fuel Pump	0822 78 250	1
Bolt	99806 0612	2
Nut	99906 0600	6
Plain Washer	99952 0600	6
Spring Washer	99971 0600	6
Ignition Coil	0822 78 440	2
Rotor	0822 78 442	1
Arm Supporter	0822 78 443	1
Cam Felt	0822 78 444	2
Cam, Trailing	0822 78 151	1
Cam, Leading	0822 78 152	1
Pulley	0822 78 153	1
Fan Belt	0822 78 154	1
Spark Plug (NGK B10.5E)	0822 78 456	
Spark Plug (NGK B11.0E)	0822 78 457	4
Spark Plug (NGK B11.5E)	0822 78 458	

1–A–5. Cooling Kit for Stage–2 and 3

Description	Part No.	
Oil Cooler	0870 78 180	1
Insulation Rubber	0820 15 312	4
Oil Hose	0870 78 181	1
Oil Hose	0870 78 182	1
Connector	99384 1200	2
Protector	0822 78 436	2
Protector	0822 78 437	1
Radiator	0870 78 190	1
Water Hose	0870 78 191	1
Water Hose	0870 78 192	1
Cooling Fan	0822 78 431	1
Set Bolt	908062 618	4
Spacer	0822 78 432	1
Set Bolt	908062 618	4
Nut	99901 0800	8
Plain Washer	99952 0822	1
Spring Washer	99971 0800	1

1–B CHASSIS AND BODY KIT

1–B–1. Suspension Kit Common for Stage–1, 2 and 3

Description	Part No.	Q'ty
Lock Bolt	0203 [illegible]	4
Rubber Bush	0305 [illegible]	2
Centering Rubber	0329 [illegible]	2
Centering Rubber	0870 [illegible]	2
Front Spring	0870 78 315	2
Rear Spring	0870 78 316	2
Stabilizer Bar	0870 78 317A	1
Bound Bumper, Front	0870 78 318	2
Bound Bumper, Rear	0870 78 319	2
Front Damper (R)	0870 78 330A	1
Front Damper (L)	0870 78 340A	1
Spring Pin	0870 78 410	2
Front Bush	0870 78 414	4
Shackle Plate	0870 78 420	2
Shackle Plate No. 2	0870 78 423	2
Rear Bush No. 2	0870 78 424	4
Rear Bush No. 1	0870 78 429	4
Rear Damper	0870 78 430	2

1–B–2. Brake Kit Common for Stage–1, 2 and 3

Description	Part No.	Q'ty
Wheel Cylinder	0233 26 610A	2
Return Spring	0820 78 441	2
Return Spring	0820 78 442	2
Brake Shoe	0839 78 460	4
Wheel Cylinder Boot	0820 78 481	4
Pad	0870 78 455	4

1–B–3. Steering Kit Common for Stage–1, 2 and 3

Description	Part No.	Q'ty
Stop Ring	0208 32 059	1
Bush, Steering Support	0259 32 071	1
Shaft Bracket	0370 32 080	1
Gear Housing (R.H.D. only)	0866 32 121	1
Oil Seal	0317 32 129	1
Shim, 0.05 mm (0.002 in)	0259 32 154	1
Shim, 0.075 mm (0.003 in)	0259 32 155	
Shim, 0.1 mm (0.004 in)	0259 32 156	
Shim, 0.2 mm (0.008 in)	0259 32 157	
Side Housing Cover (R.H.D. only)	0259 32 160	1
Gasket, Cover (R.H.D. only)	0259 32 163	1
Adjust Screw	0180 32 165A	1
Adjust Shim, 1.95mm (0.077 in)	0180 32 171A	1
Adjust Shim, 2.00mm (0.079 in)	0180 32 172A	
Adjust Shim, 2.05mm (0.081 in)	0180 32 173A	
Adjust Shim, 2.10mm (0.083 in)	0180 32 174A	
Clip	0259 55 [illegible]	1
Sector Shaft (R.H.D. only)	0870 78 [illegible]	1
Worm Ball Nut (R.H.D. only)	0870 78 [illegible]	1
Set Bolt	908012 [illegible]	8
Plug	99502 [illegible]	1
Nut	99922 [illegible]	1

1–B–4. Body Optional Kit

Description	Part No.	Q'ty
Tail Wing	0870 77 856	1
Nose Fin Set	0839 77 857	1
Over Fender Set	0870 77 858	1

1–C. DRIVING SYSTEM KIT

1–C–1. Driving System Kit Common for Stage–1, 2 and 3 (4-Forward Speed T/Mission use)

Description	Part No.	Q'ty
Drive Gear, Speedometer	0259 17 341A	1
Driven Gear, Speedometer	0249 17 345	1
Main Drive Gear	0870 79 801	1
Third Gear	0820 79 820	1
Second Gear	0820 79 830	1
Counter Shaft Gear	0820 79 851	1
Change Lever	0870 79 880	1
Knob, Change Lever	0820 79 890	1
Needle Bearing	0810 17 332	2
Spacer	0810 17 333	1
Snap Ring	0810 17 334	2
Extention Housing	0870 79 861	1
Propeller Shaft	0820 79 760	1
Clutch Disc	0870 79 750	1
Pressure Plate	0810 16 180	1
Reamer Bolt	0820 79 781	2
Spring Washer	99971 0800	2
Nut	99912 0800	2
Split Pin	99221 2015	2
Reamer Bolt	99753 48116	4
Spring Washer	99971 0800	4
Final Gear Set (Ratio 4.111)	0870 79 720	1
Differential Lock	0820 79 960	1

1–C–2. Driving System Kit Common for Stage–1, 2 and 3 (5-Forward Speed T/Mission use)

Description	Part No.	Q'ty
Rear Housing	0820 10 300F	1
Balance	0822 78 189	1
Fly Wheel	0822 78 190A	1
Clutch & T/Mission	0869 79 800	1
Propeller Shaft	0869 79 910	1
Final Gear Set (Ratio 4.375)	0869 79 720	1
Final Gear Set (Ratio 4.625)	0869 79 740	
Final Gear Set (Ratio 4.875)	0869 79 760	
Clutch Release Cylinder	0839 41 920	1
Return Spring	0613 41 308	1
Gasket	99564 1000	1
Flexible Hose	0304 43 820	1
Set Bolt	908016 828	2
Clutch Pipe	0870 78 390	1

SPORTS KIT FOR ENGINE

The sport kits for the RX-3 are broadly divided into three kinds of stage–1, stage–2 and stage–3, which are freely selectable in accordance to the notorist's driving skill and preferences. For the driving system, chassis and body, too, various beef-up packages are available for selection to suit the output of the engine.

2–A. CLASSIFICATION

2–A–1. Stage–1 Kit
Tune-up by changing parts of the intake system

2–A–2. Stage–2 Kit
Tune-up by changing parts of the intake and exhaust systems

2–A–3. Stage–3 Kit
Full tune-up for speed racing

2–B. EXPLANATION OF ENGINE KIT PARTS

2–B–1. Intake System
(1) Carburettor
The carburettor is a NIPPON KIKAI CO.'s downdraft twin choke type, excellent performance of which has been proved in races in the past. This carburettor is featured by its sensitive response to throttle opening, no inertia-caused change in fuel level by virtue of the centrally-located float chamber common to two barrels, and ease of jet replacing. Jets are available in several kinds as different jets might be required depending on the extent of engine tuning. (See the table "Carburettor Inner Parts" on page 2:1).

Specification of Carburettor

	Stage		
	1	2	3
Bore	44φ(1.73 in)	44φ(1.73 in)	44φ(1.73 in)
Sennuri	32φ×11φ (1.26 × 0.43 in)	38φ×11φ (1.50 × 0.43 in)	38φ×11φ (1.50 × 0.43 in)
Main jet	170#	220#	170#
Main air bleed	160#	170～180#	70#
Slow jet	50#	65#	75#
Slow air bleed	230#	200#	200#
Pump nozzle diameter	0.6φ(0.02 in)	0.6φ(0.02 in)	0.6φ(0.02 in)
Main nozzle diameter	4φ(0.16 in)	4φ(0.16 in)	4φ(0.16 in)
Fuel level	19mm(0.75 in)	19mm(0.75 in)	19mm(0.75 in)

(2) Air cleaner
Air induction with small resistance and good filtration is assured by a polyurethane foam air cleaner which is disposed sideways and sucks air throughout the circumference.

(3) Intake manifold and carburettor supporter
The intake manifold has been modified to permit mounting the down-draft twin choke carburettor. The carburettor supporter has been established to prevent ruffling of fuel level in the float chamber.

Carburettor Inner Parts

Description		Part No.	Q'ty
Main jet	140#	0822 78 320	2
"	145#	0822 78 321	2
"	150#	0822 78 322	2
"	155#	0822 78 323	2
"	160#	0822 78 324	2
"	165#	0822 78 325	2
"	170#	0822 78 326	2
"	175#	0822 78 327	2
"	180#	0822 78 328	2
"	185#	0822 78 217	2
"	190#	0822 78 218	2
"	195#	0822 78 219	2
"	200#	0822 78 222	2
"	205#	0822 78 319	2
"	210#	0822 78 224	2
"	215#	0822 78 225	2
"	220#	0822 78 226	2
"	225#	0822 78 227	2
"	230#	0822 78 228	2
"	235#	0822 78 229	2
Main air bleed	50#	0822 78 330	2
"	55#	0822 78 331	2
"	60#	0822 78 332	2
"	65#	0822 78 333	2
"	70#	0822 78 334	2
"	75#	0822 78 335	2
"	80#	0822 78 336	2
"	85#	0822 78 337	2
"	90#	0822 78 338	2
"	95#	0822 78 339	2
"	165#	0822 78 273	2
"	170#	0822 78 274	2
"	175#	0822 78 275	2
"	180#	0822 78 276	2
"	185#	0822 78 277	2
"	190#	0822 78 278	2
"	195#	0822 78 279	2
Slow jet	40#	0822 78 255	2
"	45#	0822 78 256	2
"	50#	0822 78 257	2
"	55#	0822 78 340	2
"	60#	0822 78 341	2
"	65#	0822 78 342	2
"	70#	0822 78 343	2
"	75#	0822 78 344	2
"	80#	0822 78 345	2
"	85#	0822 78 346	2
"	90#	0822 78 347	2
"	95#	0822 78 348	2
Slow air bleed	180#	0822 78 349	2
"	190#	0822 78 350	2
"	200#	0822 78 351	2
"	210#	0822 78 352	2
"	220#	0822 78 353	2

2–B–2. Exhaust System

(1) Exhaust manifold and pipe

Small exhaust resistance is ensured be stainless steel, straight-through independent pipes merged into a common pipe. Also, special exhaust manifolding has been established.

2–B–3. Housing

(1) Front, intermediate and rear housing

The intake port of the standard housings are additionally machined for improved intake efficiency.

Comparison of Intake Port Timing between Standard Housing and Modified One

Standard Housing	I.O. x I.C.	32°ATDC x 40°ABDC
Modified Housing	Main port I.O. x I.C.	25°ATDC x 50°ABDC
	Auxiliary port I.O. x I.C.	90°ATDC x 65°ABDC

(2) Rotor housing

The exhaust port is machined to improve exhaust efficiency. This machining is done at Toyo Kogyo as special machining techniques are required.

Comparison of Exhaust Port Timing between Standard Housing and Modified One

Standard Housing	E.O. x E.C.	80°BBDC x 48°ATDC
Modified Housing	E.O. x E.C.	73°BBDC x 65°ATDC

2–B–4. Rotating System

(1) Rotor assembly

The rotor is of the same material and configuration as the standard one. The special design made is one for preventing the internal gear from slipping out at high engine speeds (spring pin and ring lock).

(2) Flywheel and balance weight

An integral ring gear with reduced inertia moment and reduced weight is used for improved acceleration response.

(3) Needle bearing

Thrust needle bearing of tough material is used as it is subjected to greater force because of increased engine output coupled with frequent and harsh clutch engagements.

(4) Eccentric shaft

The jet-through-bearing system is used to ensure adequate rotor cooling under high-rev, high-load conditions.

(5) Rotor bearing

Rotor bearing of different material is used to ensure increased durability under high-rev, high-load conditions. A hole for rotor cooling is provided.

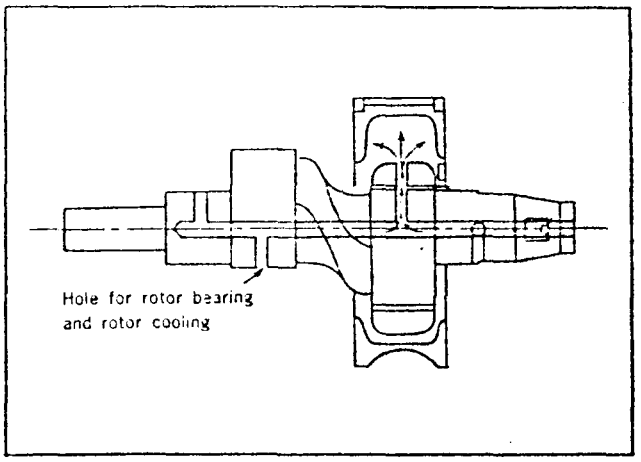


Fig. 2–1 Eccentric Shaft

2–B–5. Seals

(1) Apex seal

The taper-cut type seal so designed that combustion gas pressure acting on the seal bottom can be utilized more effectively has been adopted to ensure closer contact with the rotor housing wall.

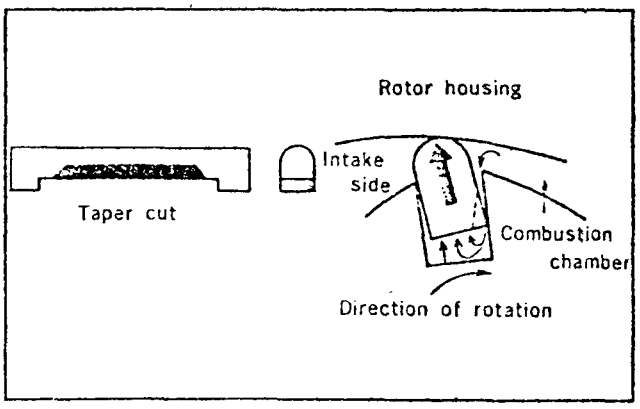


Fig. 2–2 Apex Seal

(2) Oil Seal

To ensure improved sealing efficiency at high-revs, the oil seal with a larger lip angle than the standard one is used.

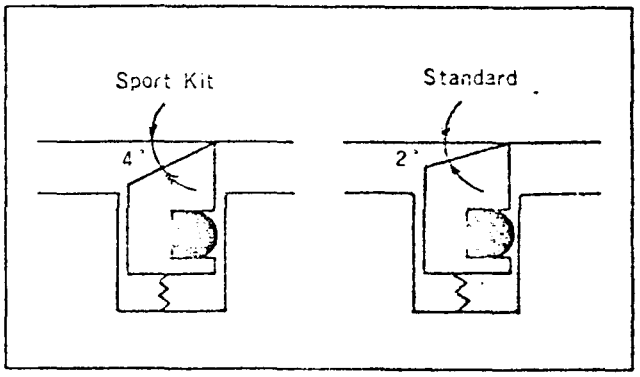


Fig. 2–3 Oil Seal

(3) Oil Seal Spring

Increased oil seal efficiency at high-speeds is ensured by using a spring having higher set load.

Standard set load	12 kg (22 lb)
Modified set load	21 kg (67 lb)

2–B–6. Lubricating System

(1) Oil pump

Lubrication requirements of the sliding parts are much severer at high engine speeds, as are rotor cooling requirements. Sufficient supply of lubricant is required to ensure durability against high-rev's and high-load. So the standard oil pump is machined to permit increased supply of lubricant.

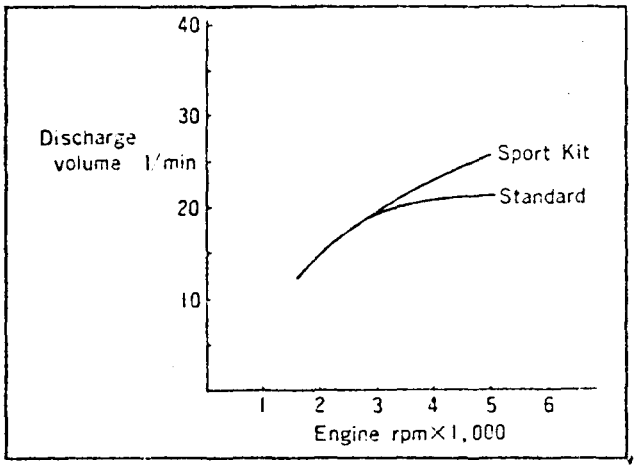


Fig. 2–4 Comparison of Lubricant Supply

(2) Oil pressure regulator

The oil pressure must be raised to give adequate lubrication under high-rev, high-load condition. So the modified unit has 6 kg/cm² (85 lb/in²) pressure as against the standard unit's 5 kg/cm² (71 lb/in²) the rise in pressure being provided by altered spring and plug.

(3) Oil cooler

As oil temperature rises under high-rev, high-load condition, an oil cooler with increased cooling capacity is used.

(4) Oil hose

The oil hose is different in shape with higher pressure resistance and strength to suit the modified oil cooler.

(5) Oil metering pump

The pump body is of the standard unit. This is modified by discontinuing the throttle linking and mounting a fixed feed plate. It has only one discharge orifice with a special connector as the modified carburettor requires just one.

Note: The control lever should be set to the full-open position for competition running, and at the hole one step lower for wearing in and other light load operation.

Relation between Lever Angle and Discharge Volume

Lever angle	Discharge volume (3,000 rpm)
0°	52 cc/Hr
34°	106 cc/Hr
39°	130 cc/Hr

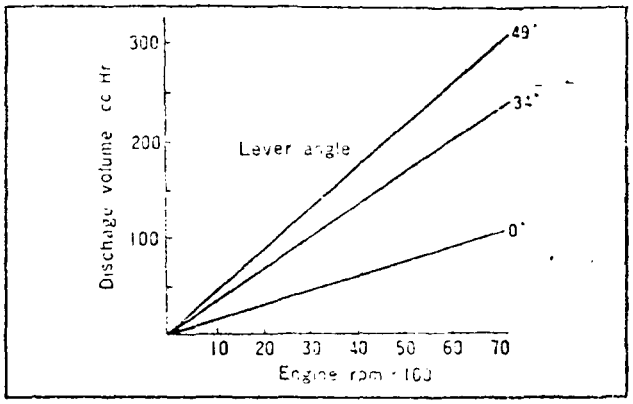


Fig. 2–5 Discharge of Oil Metering Pump

(6) Oil filler pipe

A larger-diameter gas passage is provided to cope with blow-by gas and overflowing oil. While it is possible to additionally machine the standard filler pipe, the special unit has been adopted to ensure proper ventilation.

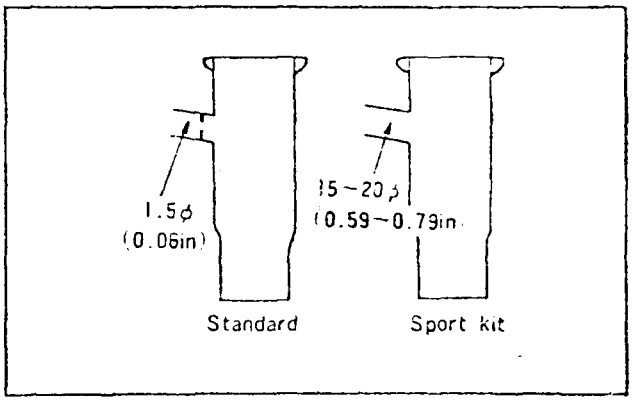


Fig. 2–6 Oil Filler Pipe

(7) Engine oil

Single grade SAE 30 ~ 40, SHELL and MOBIL products. LOCAL-MOLY or LOCAL-A.S.O. in the quantity of 7% of engine oil is added.

2–B–7. Cooling System

(1) Radiator

A radiator having increased radiating capacity is used for improved cooling under high-rev, high-load conditions.

(2) Water hose

A water hose shaped to suit the special radiator is used.

(3) Cooling fan and spacer

A polypropylene fan with six 300 mm (11.81 in) dia blades is directly connected for improved cooling effect.

(4) Fan belt

A Fan belt with increased strength is used to ensure satisfactory operation at high-revs.

(5) Water pump

Remove the thermostat from the standard unit and plug up the by pass to increase cooling efficiency.

2–B–8. Electrical System

(1) Alternator pulley

A pulley having a larger outer diameter than the standard one is used so that there will be no unnecessary rise of alternator revolution at high engine speeds.

Ratio of Standard Pulley :	2.0
Ratio of Modified Pulley :	1.7

(2) Ignition coil

An ignition coil with an external resister is used to make sure that there will be no secondary voltage drop at high-revs and powerful sparks will be obtained.

(3) Distributor

Special parts including rotor, arm supporter and cam felt are used on the standard body to prevent rotor floating and point arm jumping at high-revs and to assure accurate spark timing and powerful sparks.

(4) Spark plug

Three spark plugs varying in heat valve are available to permit selective use depending on the kind of race, the class of sport kit and other conditions.

Maker	Heat Valve
NGK	11.5 EPD
NGK	11 EPD
NGK	10.5 EPD

(5) Fuel pump

A fuel pump with an increased discharging capacity is used as more fuel is required under high-speed, high-load conditions than in the case of the standard car.

2–C. MACHINING AND ATTACHING PROCEDURE

2–C–1. Machining of Intake Port

(1) Clean the intake port of each housing with paint thinner or ketone.

(2) Assemble three side housings and two rotor housings, and tighten with three tension bolts. (See Fig. 2–7).

Note: a. Remove the eccentric shaft and rotor before assembling.

b. Insert the tubular dowel properly.

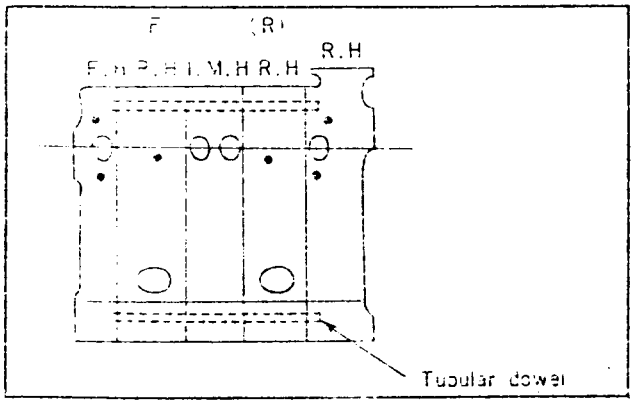


Fig. 2–7

(3) Smear blue petrolatum over the ports on the side where the intake pipes are to be attached. Then mount the modification gasket and mark lines. (See Fig. 2–8)

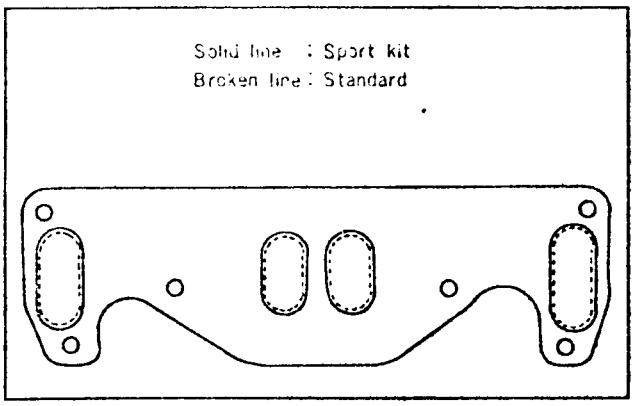


Fig. 2–8

(4) Disassemble the housings.

(5) Smear blue petrolatum at the ports in the sliding surfaces of the front housing, intermediate housing and rear housing, fix the jig (See Fig. 2–9) with the tubular dowel, and mark lines.

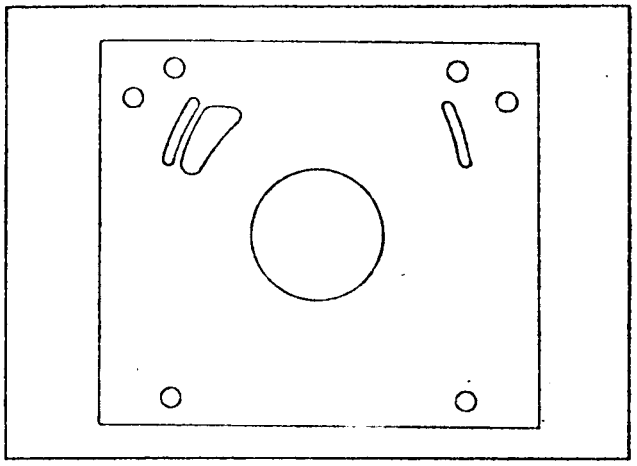


Fig. 2–9 Jig for Sliding Face Ports

(6) Turn the jig over and mark lines for the auxiliary port centerline and drill centerline.

(7) Punch the auxiliary port center mark. (See Fig. 2–10)

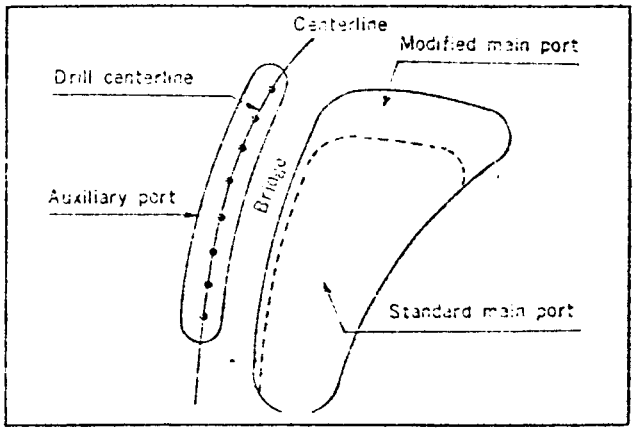


Fig. 2–10 Punch the Auxiliary Port Center Marks

(8) When the four faces of the housings have been marked, drill the holes on a drilling machine.
Note: When machining, make sure to remove studs, bolts and stationary gear.

(9) Perform the drilling operation
Drilling the auxiliary port according to the following procedures:
1) To prevent the flat sliding face from being scratched mask with tape, etc. all the surface except the machining area.
2) Use a drill of 5.5 ~ 5.8 mm (0.22 ~ 0.23 in) {width of auxiliary port: 6 mm (0.24 in)}
3) As to the front and rear side housings, see that holes No. 1 ~ 5 are drilled through hole No. 6 is drilled to the depth of under 8 mm (0.31 in) and hole No. 7 to the depth of under 3 mm (0.12 in) (See Fig. 2-11).
4) As to the intermediate housing, see that holes No. 1 ~ 5 are drilled through, hole No. 6 is drilled to the depth of under 5 mm (0.20 in) and hole No. 7 to the depth of under 3 mm (0.12 in). (See Fig. 2-12)
Note: Take special attention so that drilling be not done beyond lines. Make sure that holes No. 6 ~ 7 are drilled to specified depths, for drilling through will cause the holes to be connected with the water jacket, resulting in water leak into the combustion chamber.

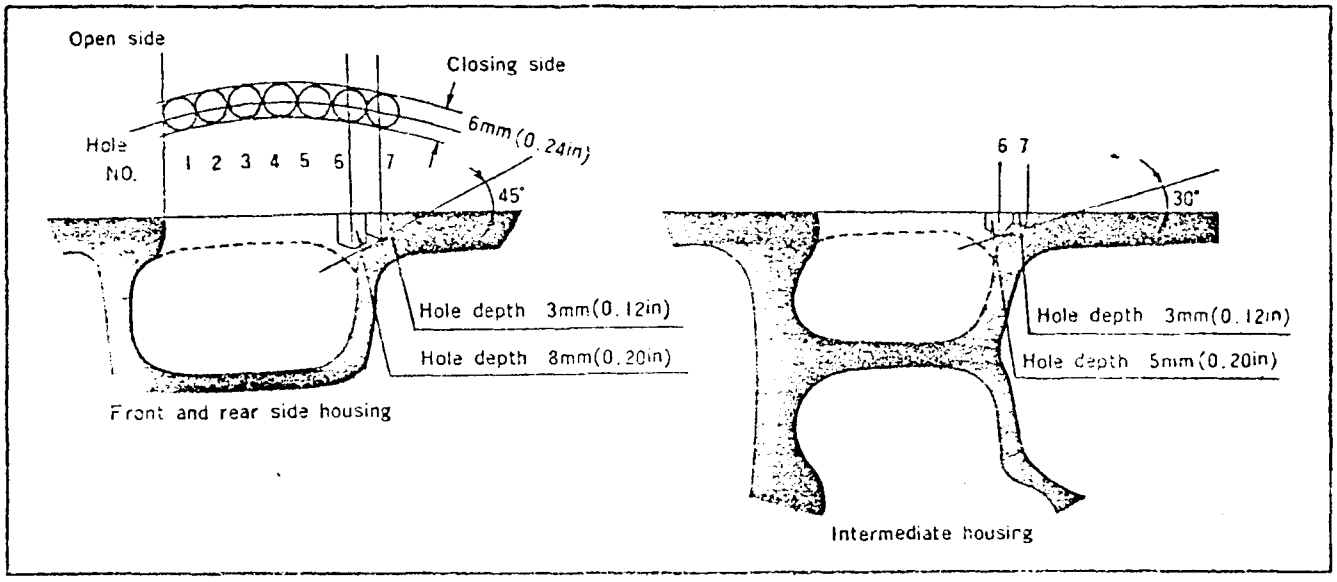


Fig. 2-11 Drilling the Auxiliary Port

(10) The port is cut in the following procedure:
1) Use a rotary bar 6 mm (0.24 in) or under across.
2) The target cutting angle for the auxiliary port closing side is 45 deg. for both front and rear housings and 30 deg. for the intermediate housing. (See Fig. 2-11)

Note: a. Carefully cut by following the marked line.
b. Firmly hold the hand cutter and take care not to scratch other sliding faces.

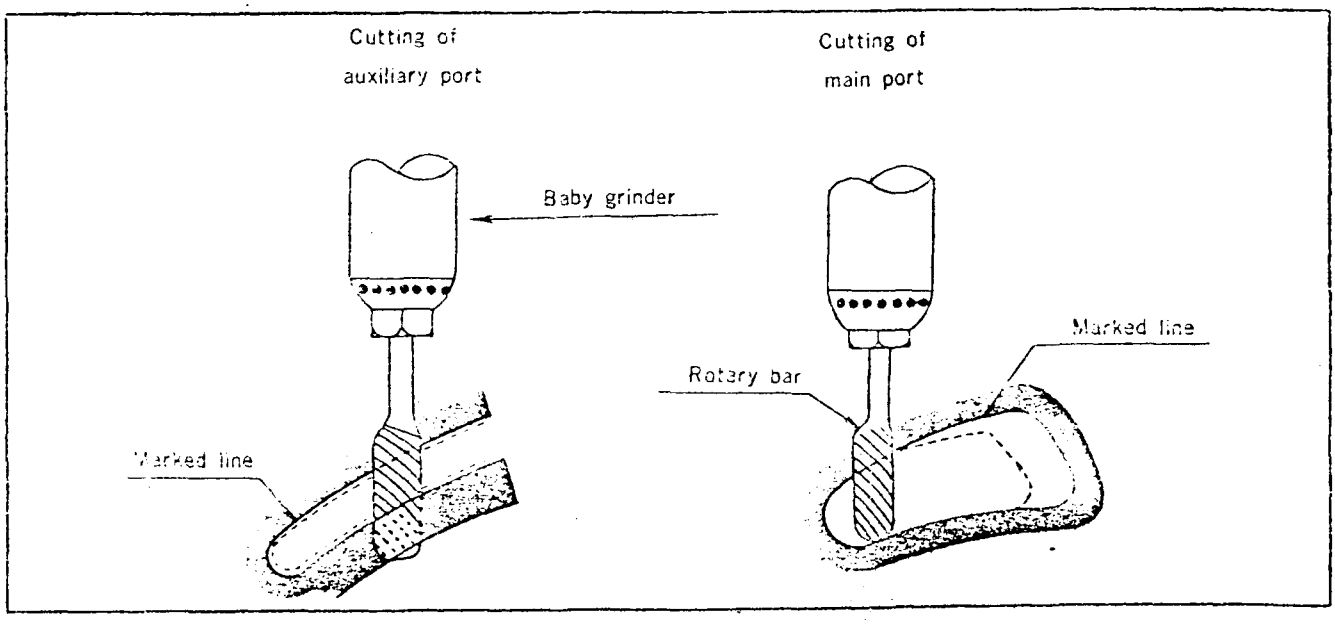


Fig. 2-12 Cutting of Port

3) Polish the port face from the inlet to the outlet, (See Fig. 2–13). Cut thicker portions with the rotary bar. Then apply the body grinder and sand paper in that order.

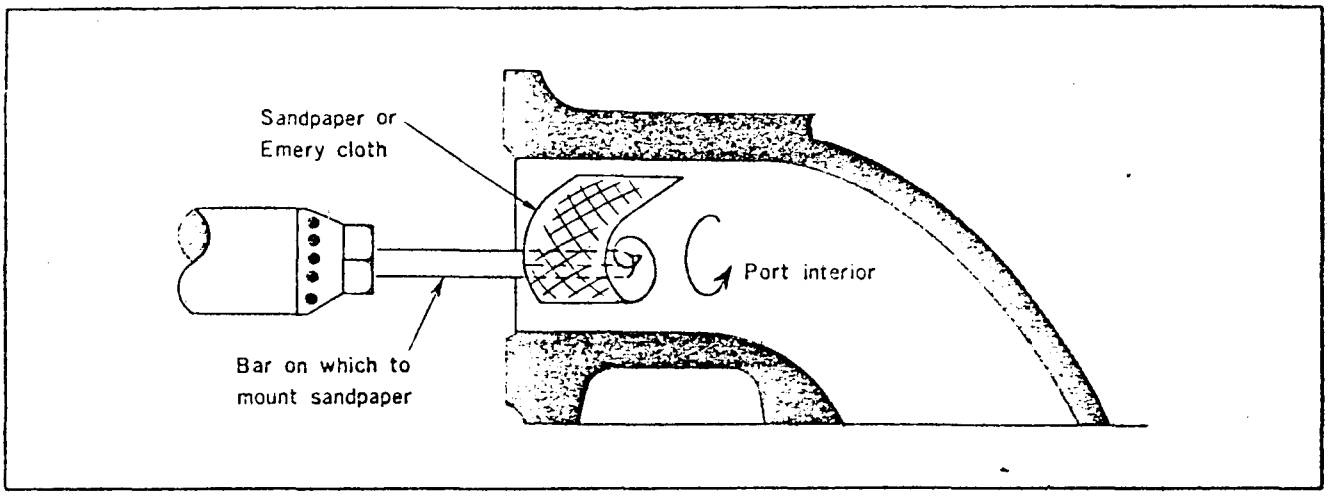


Fig. 2–13 Polishing of Port Face

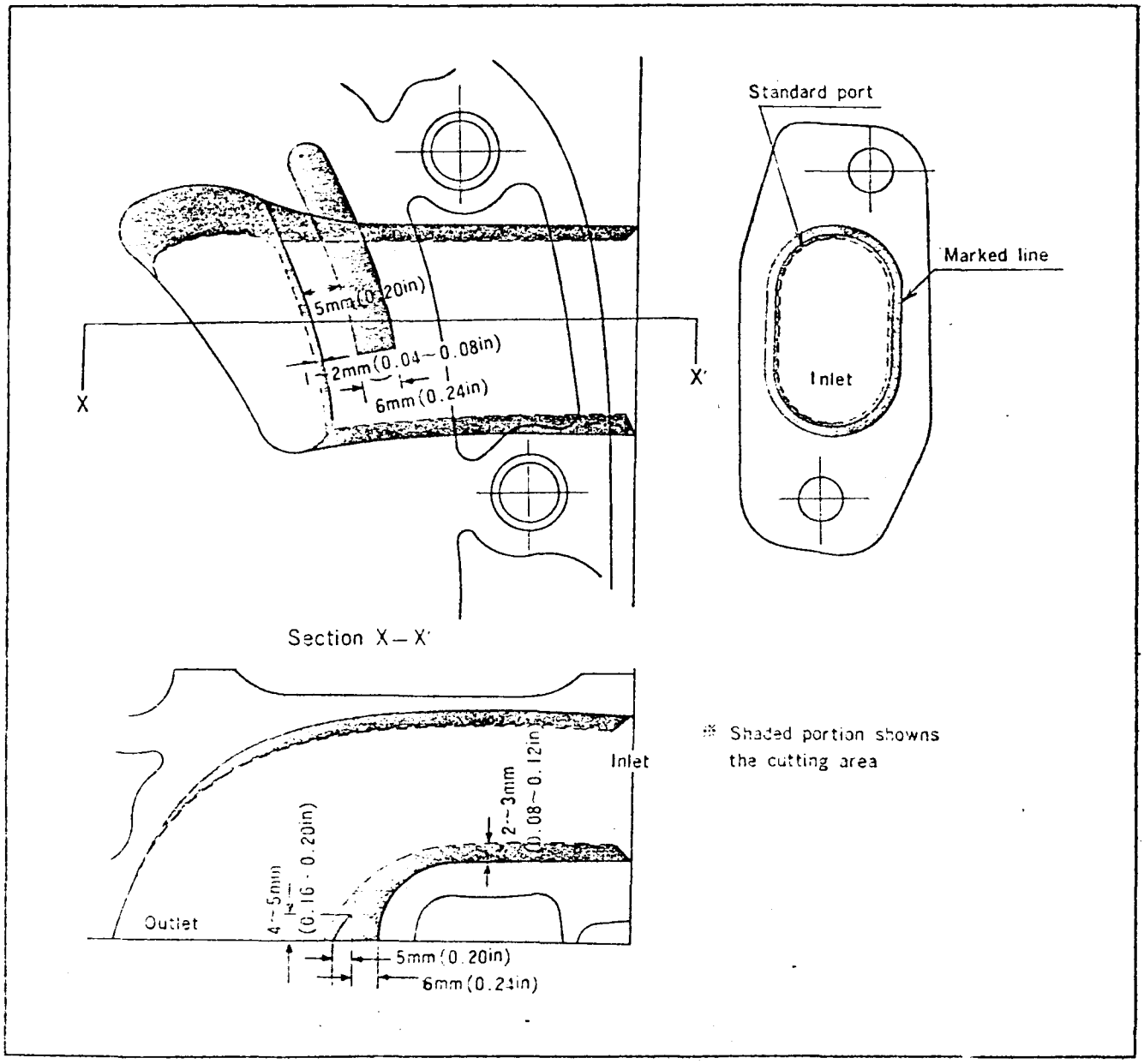


Fig. 2–14 Cutting Area of Intake Port

2–C–2. Machining of Oil Pump Body

1) Clean with paint thinner or ketone the oil pump installing side of the front housing, and apply blue petrolatum.

2) Attach the oil pump machining jig with bolts and mark the machining line.

3) Enlarge the port using a hand cutter (rotary bar 5 mm (0.20 in) dia). Smoothly cut each corner of the oil passage to as large radius as possible. (See Fig. 2–15)

Note: Any erroneous cutting will necessitate replacing the side housing, so use extra care in machining.

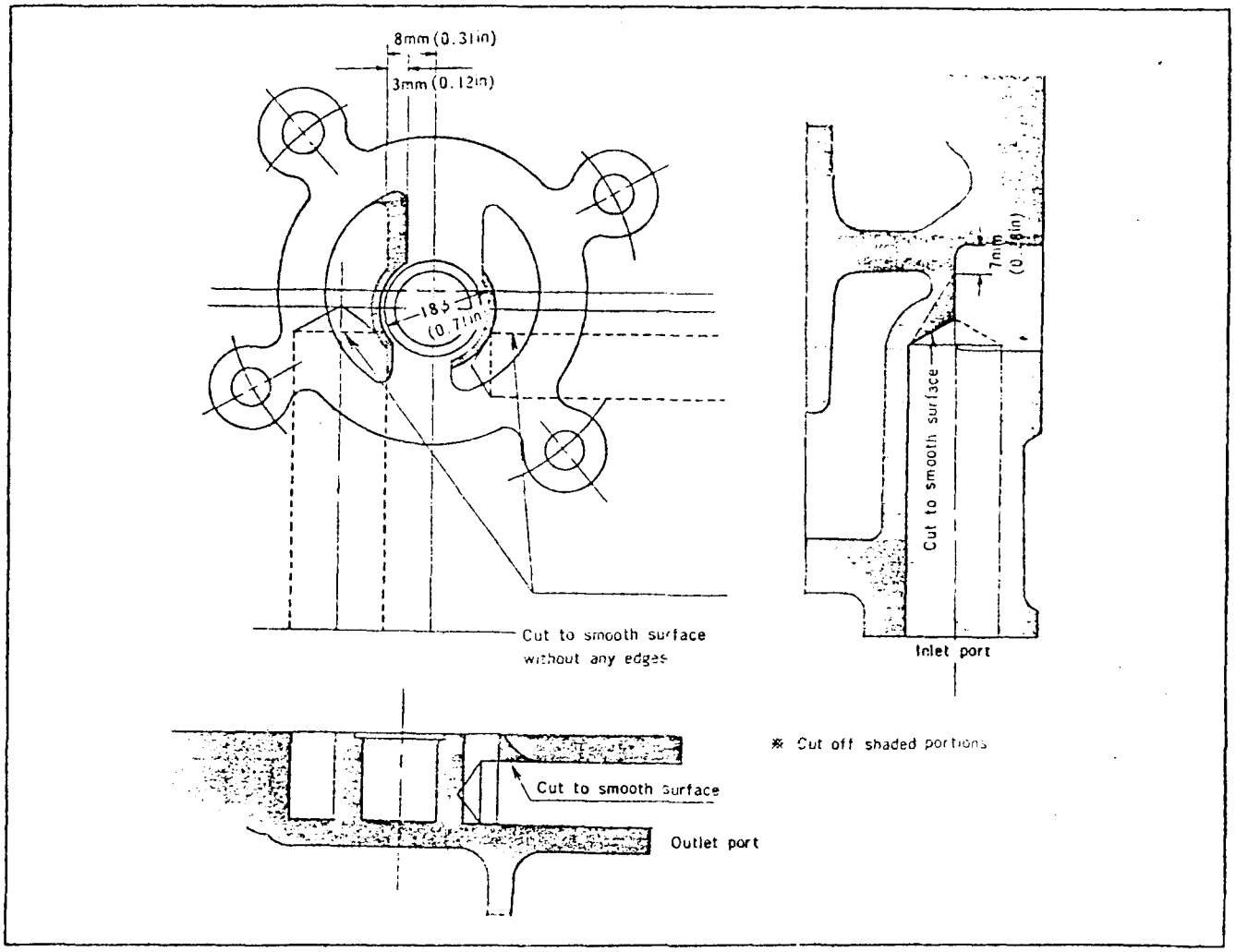


Fig. 2–15 Cutting of Oil Pump Body

2–C–3. Machining of Water Pump

(1) Make a blind plate and weld it at the by-pass hole (thermostat attaching side).

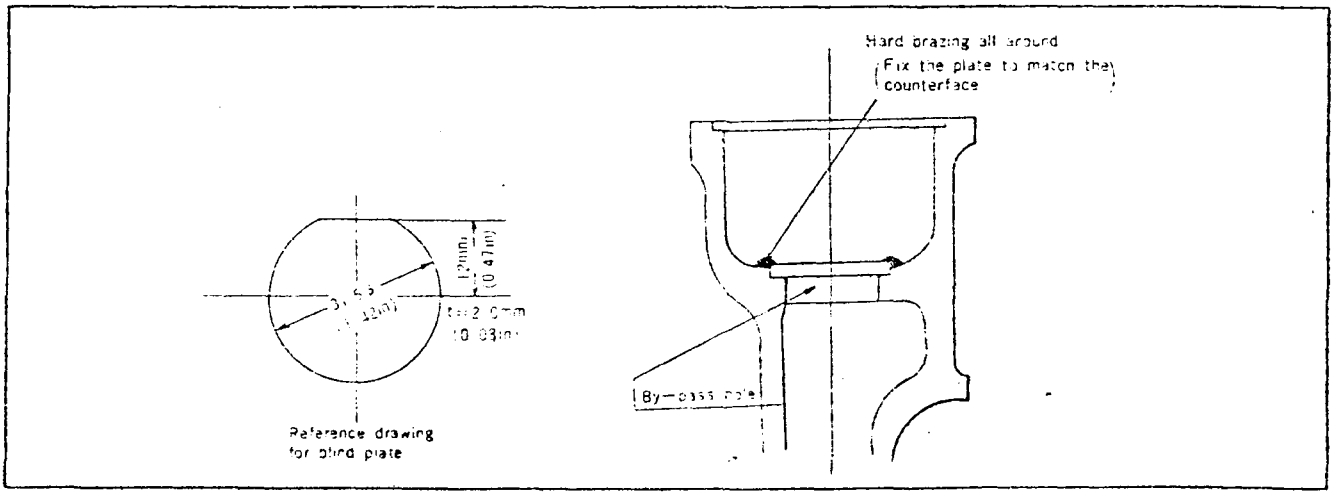


Fig. 2–16 Machining of Water Pump

2–C–4. Oil Hose Clip

(1) Use iron plate {thickness: 0.8 ~ 1.3 mm (0.03 ~ 0.05 in).}

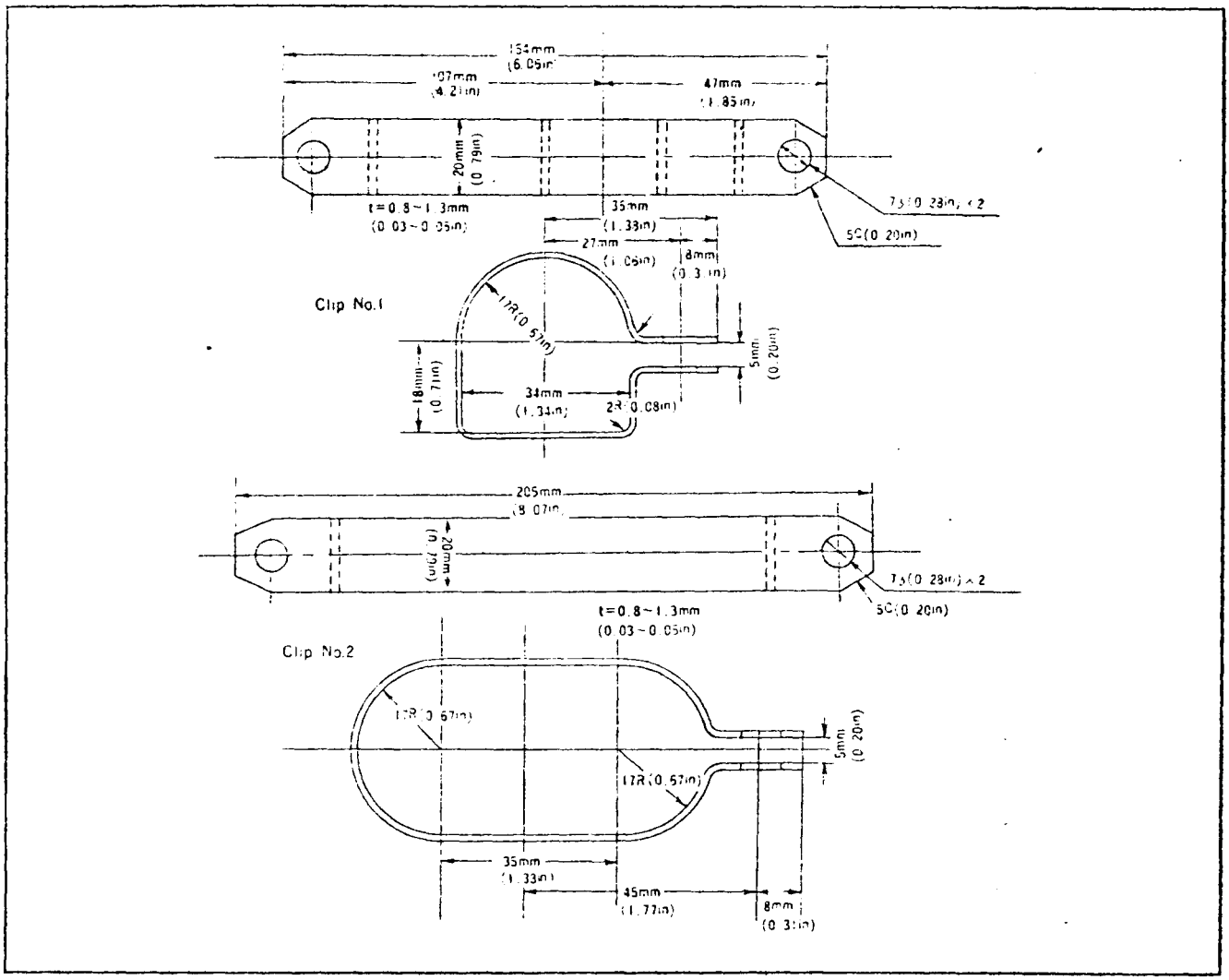


Fig. 2–17 Drawing of Oil Hose Clip

2–C–5. Machining of Drive Pulley

(1) Make a jig of the same size as the drive pulley and indicate a tally mark at 0° TDC and 5° and 15° BTDC.

(2) Attach the jig on the drive pulley and file the tally marks. (See Fig. 2–18)

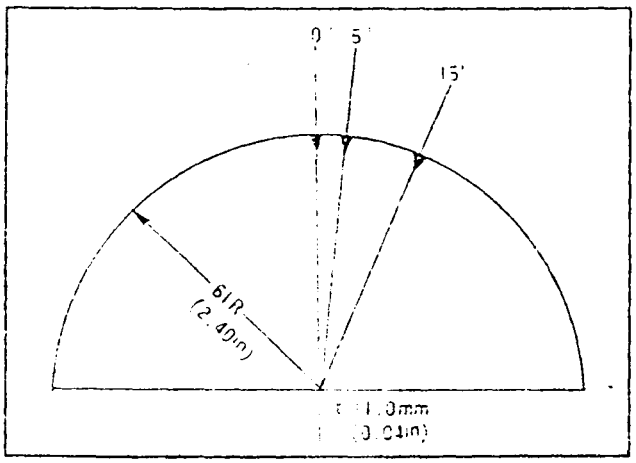


Fig. 2–18 Machining of Drive Pulley

2–C–6. Drawing for Attaching Exhaust Pipe Bracket

(1) Weld it on the rear most cross member. (See Fig. 2–19)

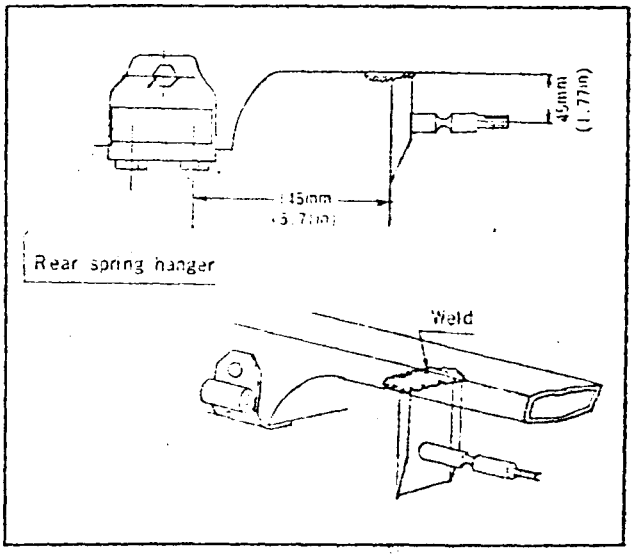


Fig. 2–19 Drawing for Attaching Exhaust Pipe Bracket

2–C–7. Machining for Fuel Pump Installation

(1) Install the fuel pump on the left wall of the trunk (See Fig. 2–20).

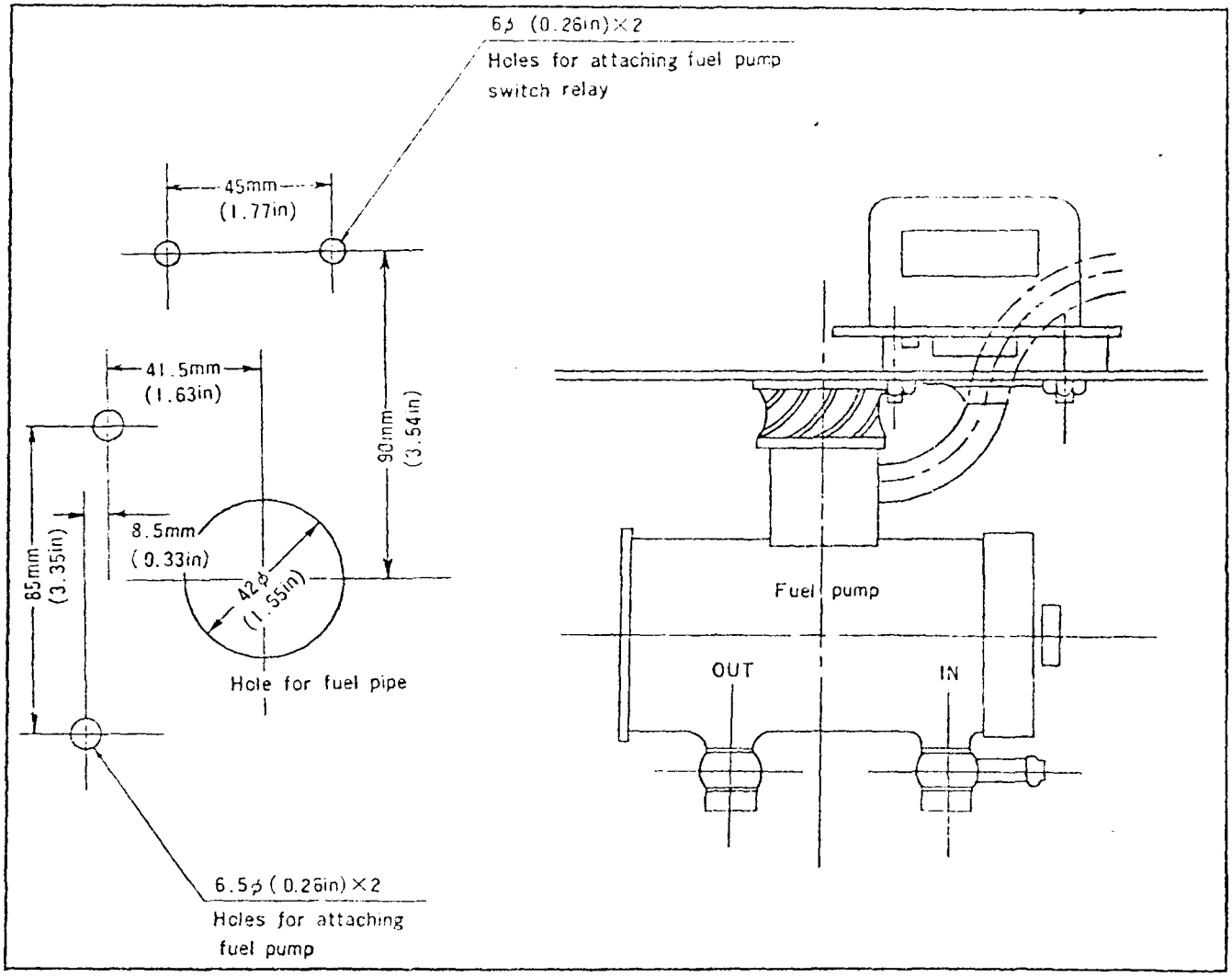


Fig. 2–20 Drawing for Attaching Fuel Pump

2–C–8. Machining of Corner Seal

(1) Smooth the both sides of the corner seal with sand paper etc.

Note: Don't chamfer the corner seal more than 0.3R (0.01 in).

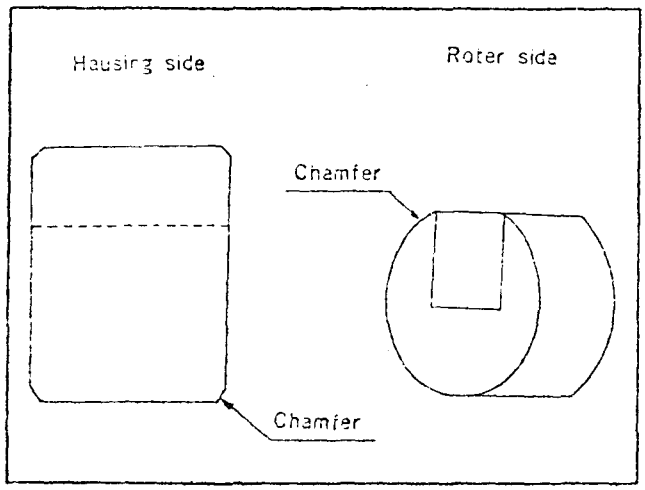


Fig. 2–21 Machining of Corner Seal

2–C–9. Drawing for Attaching Fan and Spacer

(See Fig. 2–22)

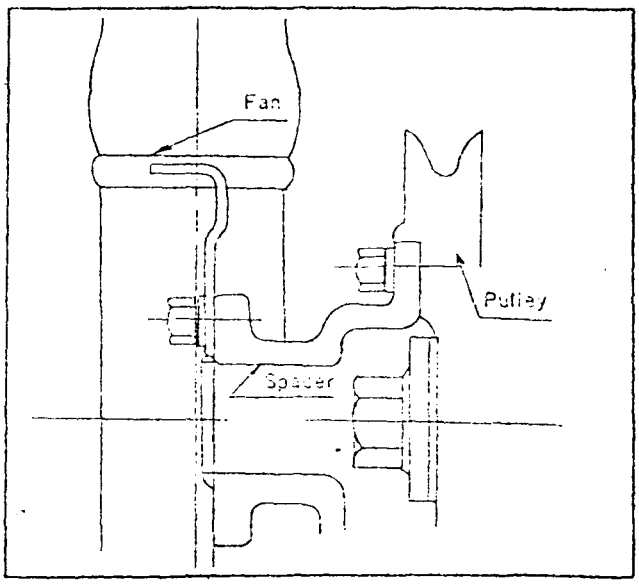


Fig. 2–22

2–C–10. Installing of Radiator

(1) Install it using the holes for the standard radiator. There is no need for machining.

2–C–11. Installing of Oil Cooler

(1) Install it using the holes for the condenser of car cooler (See Fig. 2–23).
(2) Attach it from the radiator side and fasten.
(3) The condenser attaching hole is larger than the insulation bolt, so install the oil cooler through plain washers. (See Fig. 2–23)

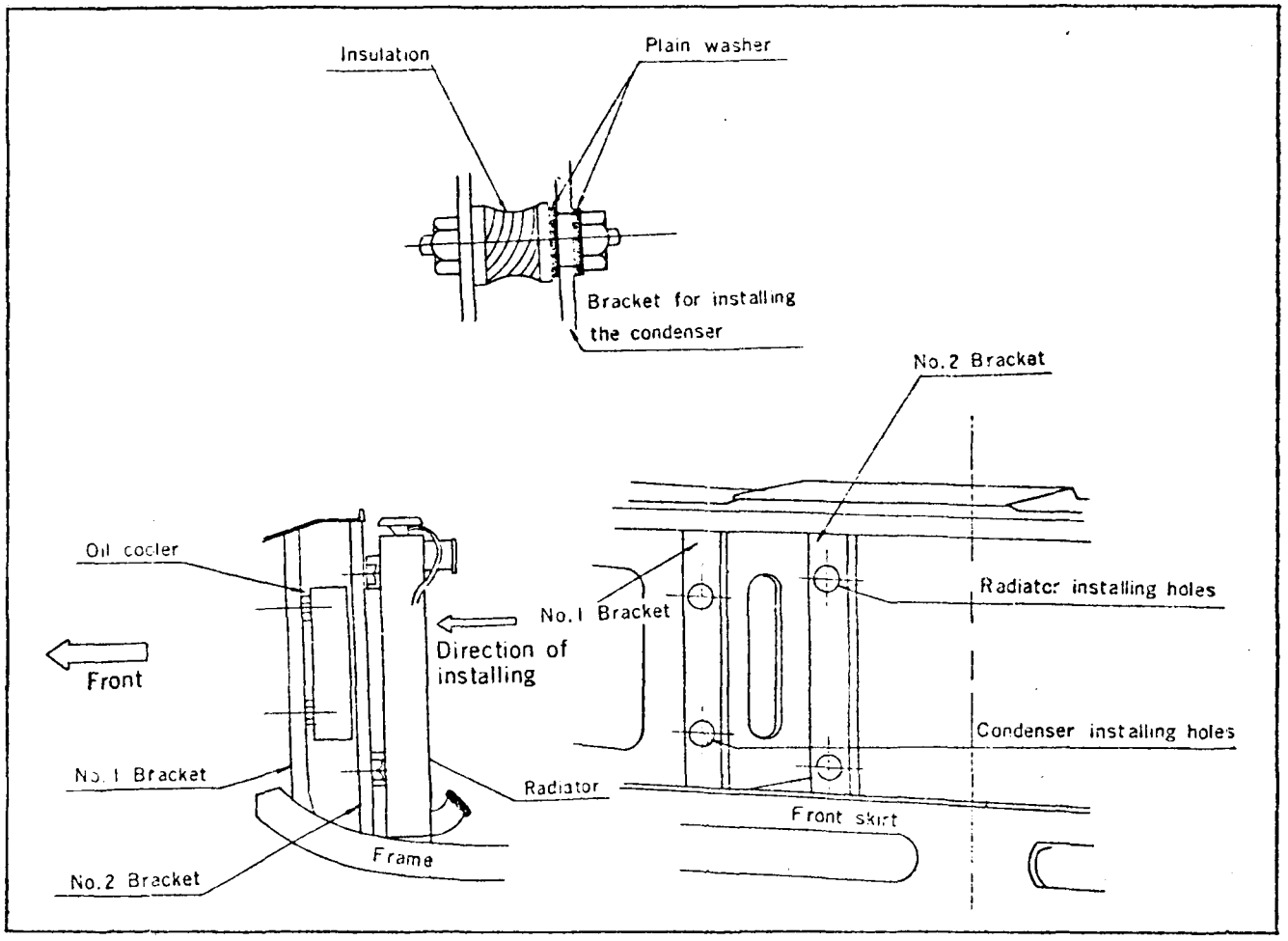


Fig. 2–23 Installing of Oil Cooler

2–C–12. Attaching of Oil Hose Clips

(1) Weld or bolt the clips to the body.
(2) In fastening the clips, be sure to attach the protector.

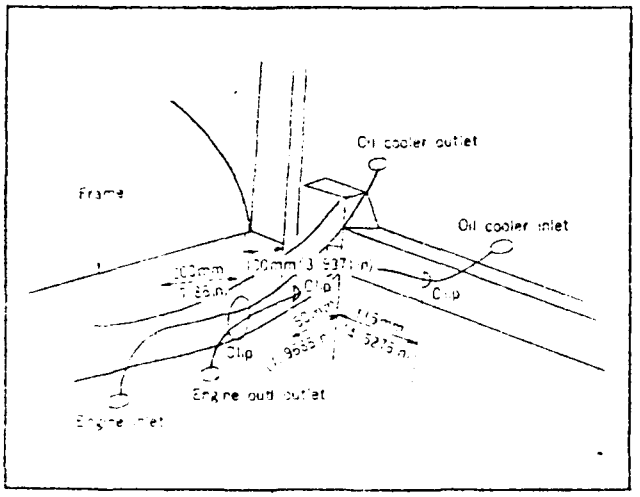


Fig. 2–24 Attaching of Oil Hose Clip

2–C–13. Replacing of Oil Pressure Control Valve

(1) The oil pressure is raised by changing spring and plug.

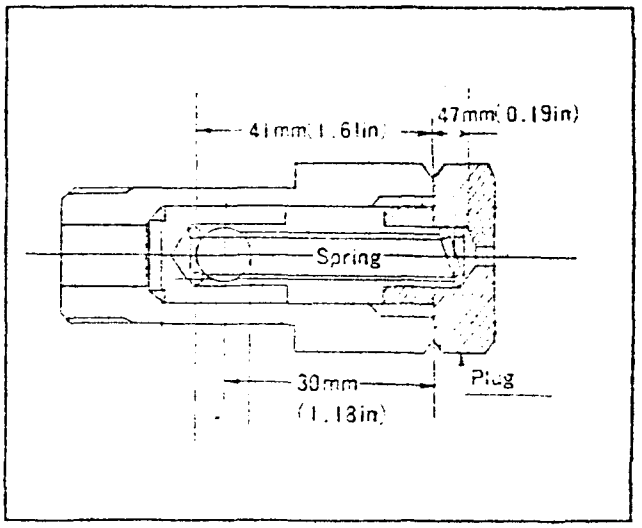


Fig. 2–25 Replacing of Oil Pressure Control Valve

2–C–14. Changing Parts of Oil Metering Pump

(1) Remove the throttle-linked lever and install the fixed lever and plate. (See Fig. 2–26)

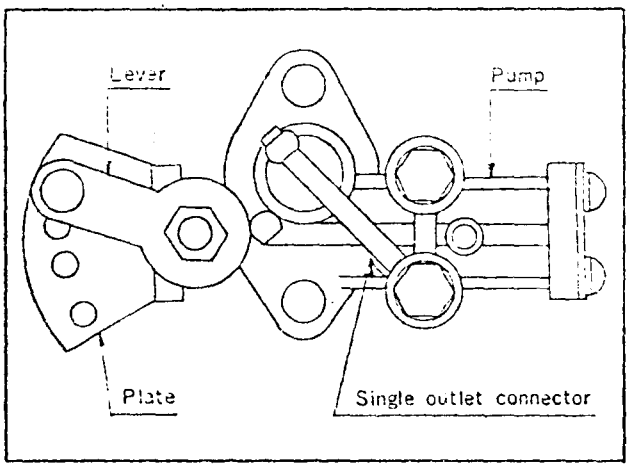


Fig. 2–26 Changing Parts of Oil Metering Pump

2–C–15. Attaching of Distributor Vacuum Control Tube (See Fig. 2–27)

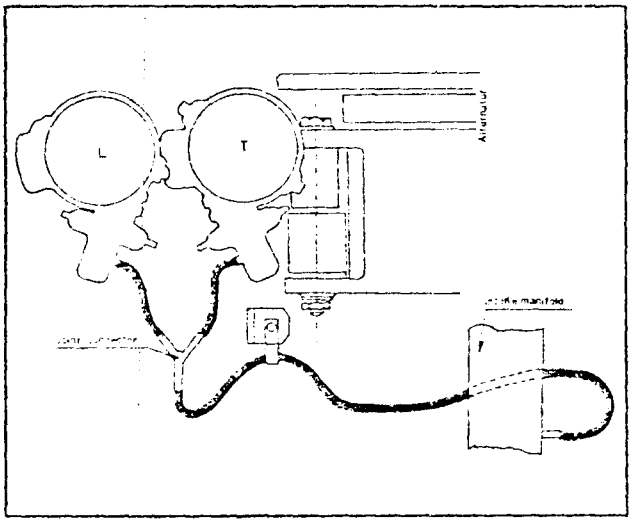


Fig. 2–27 Attaching of Distributor Vacuum Control Tube

2–C–16. Piping Procedure for Oil Metering Tube (See Fig. 2–28)

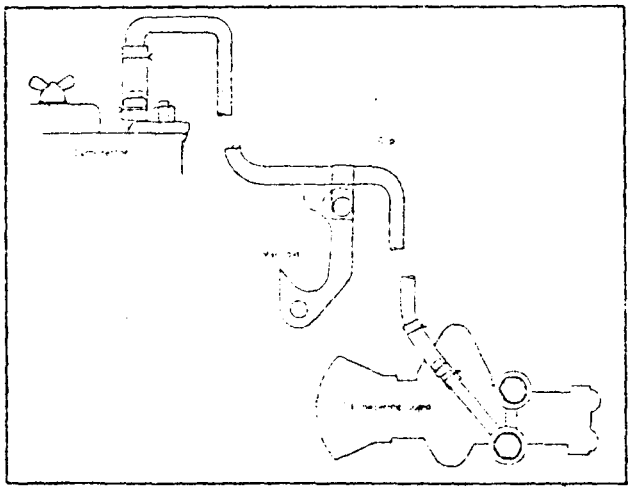


Fig. 2–28 Piping Procedure for Oil Metering Tube

2–C–17. Replacing Procedure for Safety Valve

(1) In order to prevent oil [illegible] at high-load and high engine speed, [illegible] set load of the safety valve to stop [illegible] at low pressure.

(2) Insert a washer which has [illegible] (0.47 in) in Outside diameter and 8 [illegible] in thickness between the plunger and the [illegible]. Plain washers may be stacked to secure 8 [illegible] in) in thickness.

(3) The above-mentioned remedy will increase the working pressure to 15 kg/cm² (213 lb/in²).

Note: Be sure to insert the washer between the plunger and the spring as shown in Fig. 2–29.

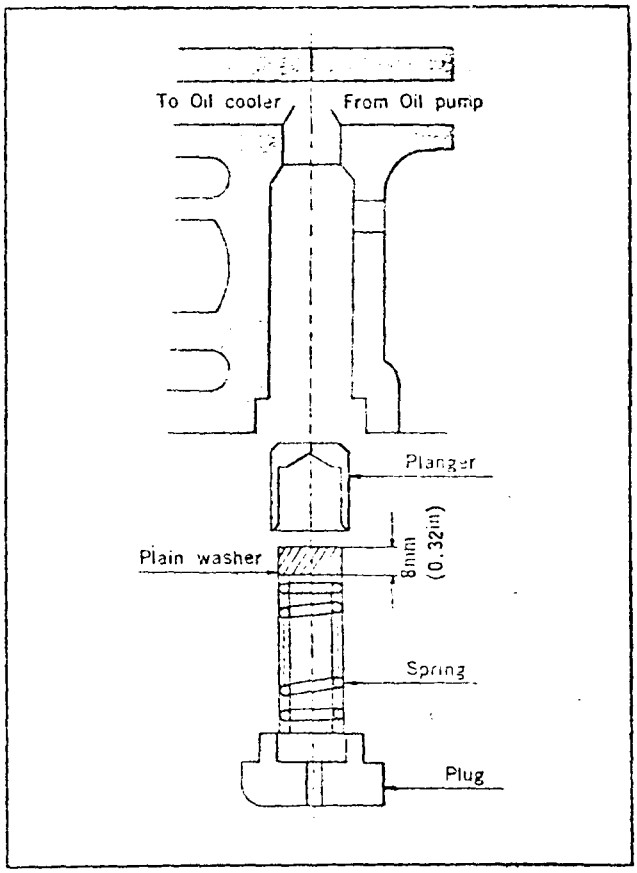


Fig. 2–29 Replacing Procedure for Safety Valve

2–C–18. Meters and Gauges

Regarding meters and gauges, use those which are available on the market. Meters and gauges with the specifications as indicated below are desirable.

Description	Max. Scale	Min. Scale	Graduation	Type
Oil Temperature Gauge	150°C (302°F)	50°C (122°F)	2～5°C (37～41°F)	Electrical
Water Temperature Gauge	120°C (248°F)	50°C (122°F)	2～5°C (37～41°F)	Electrical
Tachometer	10,000 rpm			Electrical
Oil Pressure Gauge	8～10 kg/cm² (114～142 lb/in²)		0.5～1.0 kg/cm² (7～14 lb/in²)	Bourdon Tube

Note: Calibrate all gauges listed above.

2–D. INSPECTION AND MEASUREMENT TABLE

System	Inspection Item	Gauge	Comparison between Standard and Tune-up Kit	
			S.T.D.	TUNE-UP KIT
Rotor and Seals	ΔF : Gap of corner seal and rotor groove	Feeler gauge		0.5 ~0.7 mm (0.020 ~0.028 in)
	ΔR : Gap of side housing and rotor	Micrometer	0.13 ~0.17 mm (0.0051 ~0.0067 in)	0.13 ~0.17 mm (0.0051 ~0.0067 in)
	ΔH : Rotor land protrusion	Straight edge. Feeler gague	0.10 ~0.15 mm (0.004 ~0.006 in)	0.10 ~0.15 mm (0.004 ~0.006 in)
	ΔG : Gap of apex seal and rotor groove	Feeler gauge	0.04 ~0.05 mm (0.0016 ~0.0020 in)	0.05 ~0.06 mm (0.0020 ~0.0024 in)
	ΔS : Gap of apex seal and side housing	Micrometer	0.05 ~0.07 mm (0.0020 ~0.0028 in)	0.05 ~0.07 mm (0.0020 ~0.0028 in)
	ΔC : Gap of corner seal and rotor groove	Feeler gague	0.02 ~0.048 mm (0.0008 ~0.0019 in)	0.02 ~0.03 mm (0.0008 ~0.0012 in)
	ΔW : Gap of side seal and rotor groove	Feeler gauge	0.04 ~0.07 mm (0.0016 ~0.0028 in)	0.04 ~0.07 mm (0.0016 ~0.0028 in)
	ΔE : Gap of side seal and corner seal	Feeler gauge	0.13 ~0.25 mm (0.0051 ~0.0098 in)	0.10 ~0.20 mm (0.004 ~0.008 in)
Springs	Apex seal			New part
	Corner seal			S.T.D.
	Side seal			S.T.D.
	Oil seal spring set load		12 kg (22 lb)	21 kg (67 lb)
	Oil seal lip angle		2°	4°
Lubrication	End float of the rotors	Straight edge Feeler gague	0.03 ~0.125 mm (0.0012 ~0.0049 in)	0.02 ~0.05 mm (0.0008 ~0.0020 in)
	Discharge volume of the oil metering pump		260cc/H/3,000rpm (2 outlet full open)	260cc/H/3,000rpm (1 outlet full open)
	Free length of the pressure spring	Slide calipers	46.4 mm (1.83 in)	50.0 mm (1.97 in)
Bearings	Oil clearance between the main bearing and eccentric shaft main journal	Inside gauge Micrometer	0.04 ~0.06 mm (0.0016 ~0.0024 in)	0.05 ~0.07 mm (0.0020 ~0.0028 in)
	Oil clearance between the main bearing and eccentric shaft main journal	Inside gauge Micrometer	0.04 ~0.06 mm (0.0016 ~0.0024 in)	F 0.05~0.07 mm (0.0020 ~0.0028 in) R 0.08~0.10 mm (0.0031 ~0.004 in)
	Oil clearance between the rotor bearing and rotor journal	Inside gauge Micrometer	0.04 ~0.08 mm (0.0016 ~0.0031 in)	0.06 ~0.08 mm (0.0024 ~0.0031 in)
	End play of the eccentric shaft	Dial gauge Magnet base	0.04 ~0.07 mm (0.0016 ~0.0028 in)	0.04 ~0.07 mm (0.0016 ~0.0028 in)
Electric	Ignition timing	Timing light Tach. dwell tester	L = 0° T = -5° at 700 rpm	L = +15° T = + 5° at 6,000 rpm
Bolts	Tightening torque of tension bolt	Torque wrench	3.5 m-kg (25 ft-lb)	3.5 m-kg (25 ft-lb)

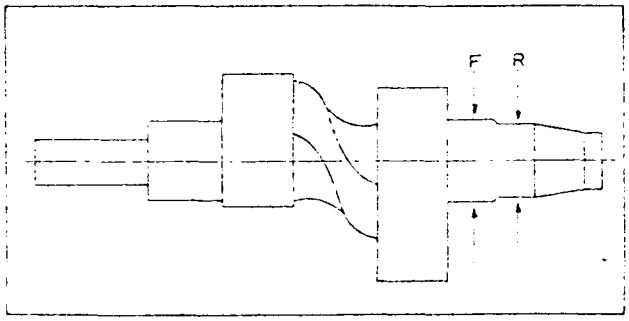


Fig. 2–30 Main Bearing Oil Clearance

Note: Measurement of Rotor Housing
In the case of standard car, measurement is done on the basis of "A" dimension of the rotary housing, but in the case of sport kit engine, the rotor housing is measured at eight places as before and the clearance is measured from the minimum width.

WORK PROCEDURE FOR ENGINE

3–A. STAGE–1

3–A–1. Parts Needed for Stage–1
See the parts listed in this manual

3–A–2. Removing and Disassembling
(1) Removal of intake manifold and carburettor
Follow work procedure for standard car.
(2) Removal of oil metering pump
Follow work procedure for standard car.

3–A–3. Replacing and Installing
(1) Replacing parts of oil metering pump
(Refer to Fig. 2–26).
- a. Remove the lever and return spring attached to the control shaft.
- b. Remove 2-outlet oil tube connector.
- c. Remove the plate on the control shaft side.
- d. Install the plate for sports kit.

Note: Do not forget to put in "O" ring inside the plate.
- e. Install port kit lever on the control shaft.

Note: Do not install the return spring.
- f. Install the oil tube connector.

Note: Do not forget to use one piece aluminum packing each at top and bottom of connector fitting portion.
- g. After completing the replacement of pump parts, connect the tube to the connector.

(2) Installing intake manifold and carburettor
- a. Install the replaced oil metering pump with the replacement parts installed.
- b. Attach the supporter ass'y and the carburettor on the intake manifold for sport kit.

Note: Use one packing each at top and bottom of the supporter.
- c. Install the manifold and carburettor on the engine.

Note: Do not forget to put in the gasket.
- d. Install the oil metering tube on the carburettor. (Refer to Fig. 2–28)
- e. Install the distributor vacuum control tube. (Refer to Fig. 2–27)
- f. Install the throttle wire and return spring.
- g. Install the vacuum hose of the power brake unit.
- h. Install the air cleaner.

3–B. STAGE–2

3–B–1. Parts Needed for Stage–2
See the parts listed in this manual

3–B–2. Removing and Disassembling
(1) Remove the intake manifold and carburettor.
(2) Remove the oil metering pump.
(3) Remove the exhaust manifold and main silencer.
Note: Remove all the above-mentioned parts according to work procedure for standard cars.

3–B–3. Replacing and Machining
(1) Installation of exhaust pipe bracket
Refer to Fig. 2–19.
(2) Replacing parts of oil metering pump
Refer to 3–A–3 (1) in Stage–1.
(3) Cut off the flange of the exhaust pipe and make a flange newly.

3–B–4. Installing
(1) Installing exhaust manifold and carburettor
Refer to 3–A–3 (2) in Stage–1.
(2) Installing exhaust manifold and exhaust pipe
Refer to Fig. 3–1.
- a. Install the exhaust manifold (Stage–2 part). As to the gasket, use standard one.
- b. Fit the rear end of the exhaust pipe and connect the manifold and the pipe.
- c. Fit the pipe intermediate bracket.
- d. Fit the pipe to the holder (under transmission)

Note: Use the standard intermediate bracket.

3–B–5. Engine Adjustment
(1) Ignition timing
T side = -5° L side = 0°
Work procedure is based on that for standard cars.
(2) Idle adjustment
Adjust the idle adjusting screw and the throttle adjusting screw alternately and set them at a spot most suitable for idling.
Idling speed: 1,000 rpm.
(3) Carburettor adjustment
Refer to carburettor section P. 3 : 3.

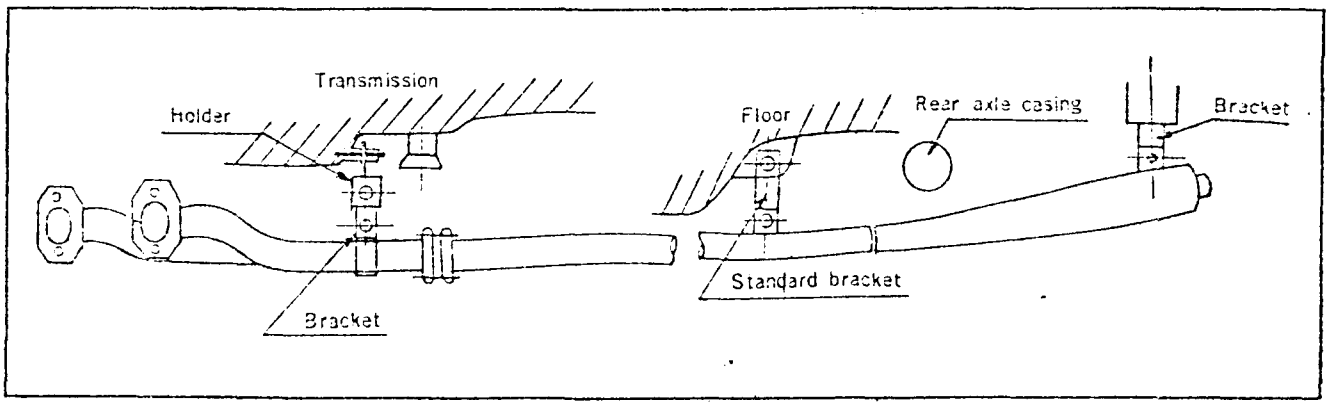


Fig. 3–1 Installing Exhaust Pipe and Exhaust Manifold

3–C. STAEG–3

3–C–1. Parts Needed for Stage–3
See the parts listed in this manual.

3–C–2. Removing, Disassembling and Installing
These procedure confirm to the procedure for standard vehicle.

3–C–3. Inspection and Measurement
(1) Follow work procedure for standard car.
(2) For measurement values Inspection and Measurement Table is shown. (P. 2 : 12)
(3) Carry out measurement and adjustment of the oil clearance between main bearing and eccentric shaft main journal (R.R. side) and ΔC with extra care.

3–C–4. Notes for Assembling
(1) Inspection of ΔF
Install the front and rear rotors without seals, and confirm the clearance between the waisted portion of the rotor housing and the rotor flank. ΔF shall be within the range of 0.5 ~ 0.7 mm (0.020 ~ 0.028 in). (Four spots with in the case of rotor housing and six in the case of rotor.)
Note: If ΔF is smaller than the prescribed clearance, the rotor and the rotor housing may interfere with each other at high-speeds.

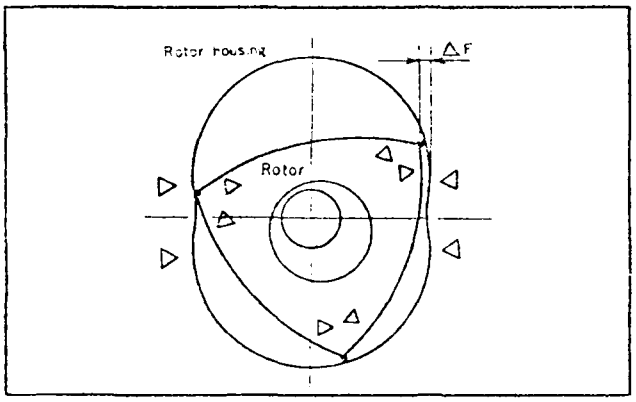


Fig. 3–2 Inspection of ΔF

(2) Installing of apex seal
When installing, make sure to place the tapered side in the rotating direction of the rotor.
Note: If fitted in the opposite direction, the merit of the tapering will be lost.

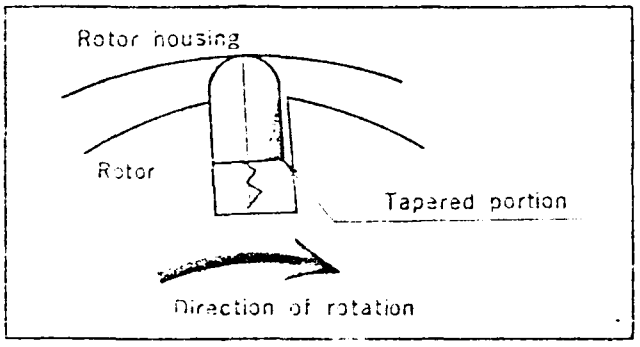


Fig. 3–3 Installing Apex Seal

3–C–5. Installing of Engine
Install in accordance with the operation procedure of the standard version. Looseness of one bolt or nut may prove crucial when running at extreme running conditions. So tighten thoroughly.

3–C–6. Starting Engine
a. Make sure to check the amount of oil and water before starting the engine.
b. Check again the tightening of each area.
c. Adjust the fuel level of the carburettor. (See P. 3 : 3)
d. Depress the accelerator pedal one or two times before turning the starter.
e. After the engine is started, observe the condition a while at 1,500 ~ 2,000 rpm.
f. Check if the needle of the oil pressure gauge registers in the range of 5.5 ~ 6.0 kg/cm² (78 ~ 85 lb/in²).
g. Check if there is any sign of water and oil leak.
h. After completion of warming up, the engine speed may be raised to 3,000 rpm.

3–C–7. Engine Adjustment
(1) Ignition timing
Set the ignition timing to the following conditions with the vacuum control tube removed.
Trailing: 2° / 3,000 rpm
Leading: 13° / 3,000 rpm
After completely braking-in, set to the following.
Trailing: 5° / 6,000 rpm
Leading: 15° / 6,000 rpm
(2) Idling adjustment
Adjust alternately the idle adjusting screw and the throttle adjusting screw to get the best idling rpm.
Idling speed: 1,500 rpm
(3) Breaking-in
Confine the engine speed to 5,000 rpm and refrain from driving under heavy load during the first 1,000 km.
(4) Points to be noted while driving
a. If the oil temperature should rise over 110°C (230°F) recheck the cooling system.
b. When the oil pressure is less than 6.0 kg/cm² (85 lb/in²) at 4,000 rpm, stop the engine immediately and find the cause.
(5) Fan belt adjustment (Same procedure applied in Stage–1, 2 and 3.)
a. Make sure to carry out the inspection before the car is operated.
b. Set the belt to deflect 10 mm at 10 kg (0.39 in at 22 lb).

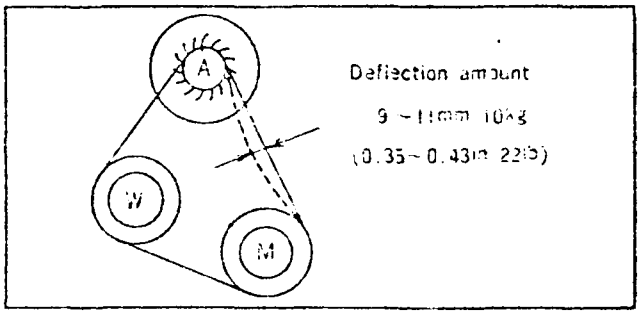


Fig. 3–4 Fan Belt Adjustment

3–D. DISASSEMBLING, INSTALLING AND ADJUSTING CARBURETTOR

3–D–1. Replacing of Jets

(1) Loosen the wing nut and remove the inspection cover assembly.
(2) The main jet and the main air bleed are in the emulsion tube. Remove the emulsion tube with a slotted-head driver, and the main jet and the main air bleed come out together.
(3) Remove the main jet and the main air bleed from the emulsion tube.
(4) Remove the slow jet and the slow air bleed separately.
(5) Install the jets, etc. in reverse procedure of removing.

3–D–2. Replacing of Venturi

(1) Remove the air horn cover.
(2) Remove the accelerating pump nozzle.
Note: There are three check balls in the accelerating pump passage. If the throttle lever is operated with the nozzle removed, the accelerating pump will be actuated and the balls will jump out into the intake manifold. Extra caution therefore is called for,
(3) Loosen the lock nuts on both sides and remove upward.
(4) Remove the large venturi upward by putting in it the index and middle fingers.
(5) Installation is carried out in reverse procedure of removing.

3–D–3. Fuel Level Adjustment

(1) Measure the distance between the upper side of the carburettor case and the fuel level.
(2) Adjust the fuel level by bending the float spring seat or fitting the shim in the nipple portion. Refer to Fig. 3–5.

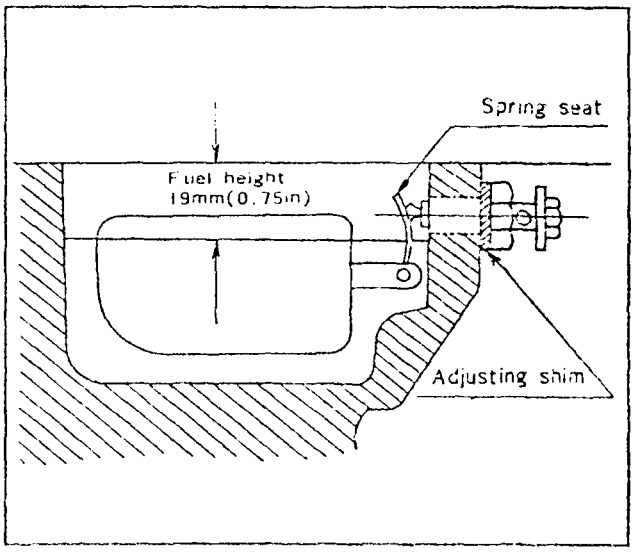


Fig. 3–5 Adjusting of Fuel Level

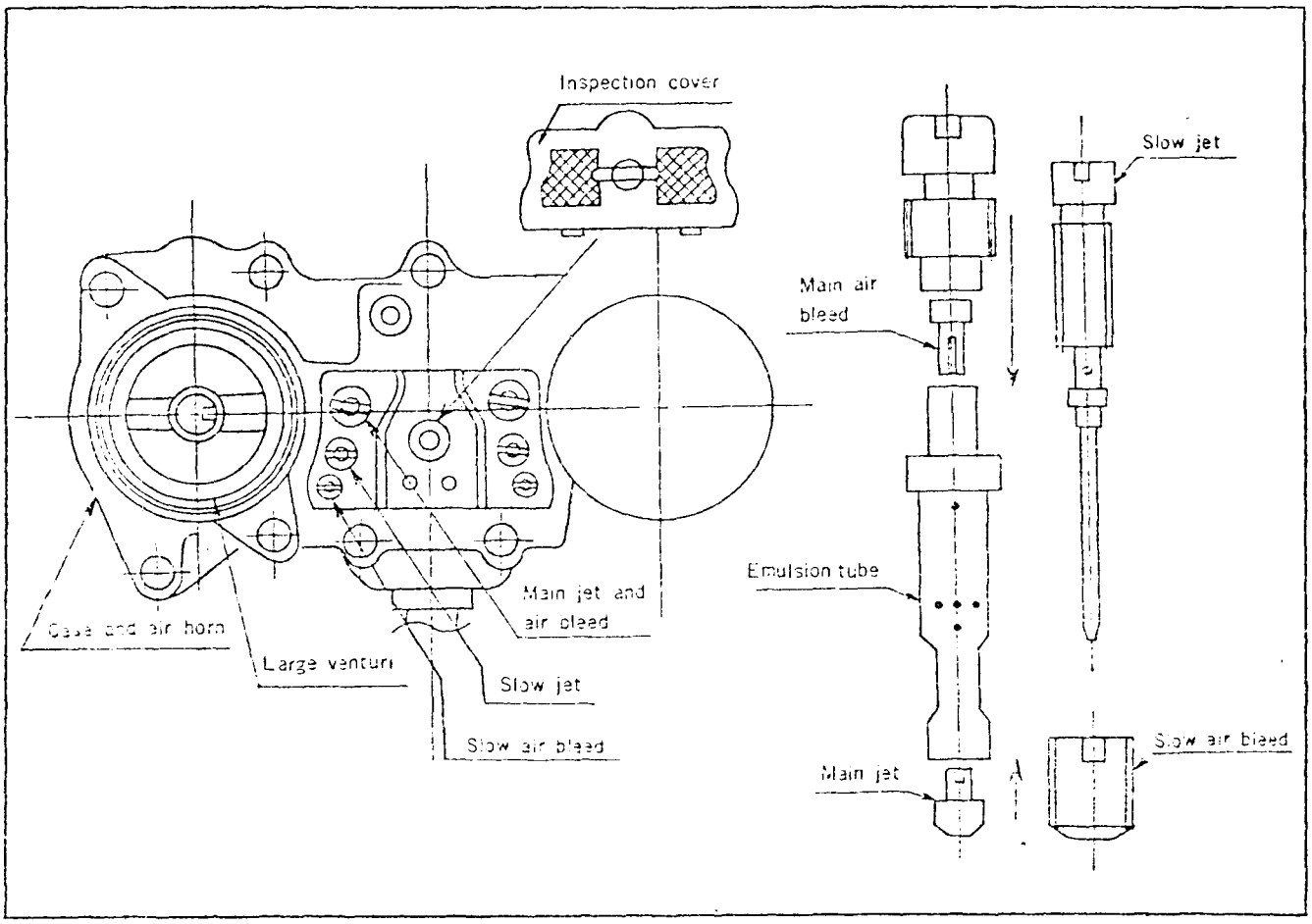


Fig. 3–6 Carburettor

3–E. POSSIBLE TROUBLES AND PREVENTIVE MEASURES OF MODIFIED ENGINE

Cars fitted with modified engines are subject to hard driving conditions. A small mistake may lead to a serious trouble. We shall therefore mention some preventive measures against troubles in the following lines.

3–E–1. Hard Starting

Cause and Prevention

(1) Improper contact of battery terminal and wiring
When driven for a racing purpose, the vehicle itself produces quite an amount of vibration and the contact of the wiring tends to be loosened. Carry out the inspection before driving.
(2) Faulty spark plug
a. Burning of electrode due to improper selection of heat value ..... too low heat value
b. Misfiring due to fouling and heating ..... too high heat value
Proper selection of spark plug is important for race driving. Especially, the heating condition changes depending upon the extent of the engine tuning, driver's driving skill, conditions of the racing ground, carburettor setting and others. Therefore these must be taken into consideration when selecting spark plug.
(3) Faulty distributor
Check before driving to see that there is no leak from cap and rotor due to crack, moisture and fouling, floating up of rotor, too large or too small point gap or scorch.
(4) Disconnection of high tension cord and leak
(5) Battery discharge and capacity drop
Be sure to check before driving.
(6) Carburettor overflow
Check the fuel tank if there is any foreign matter in the fuel tank and if the strainer is clogged by foreign objects.

3–E–2. Engine Overheating

Cause and Prevention

(1) Loosened fan belt
A loosened fan belt causes the fan belt breakage and overheating. When replacing with a new fan belt, allow sufficient breaking in and adjust for the right tension as shown in Fig. 3–4. Be sure to check before driving.
(2) Deteriorated water hose
The water hose which shows normal performance at low speeds may collapse at high speeds because of the suction force of the water pump and the flow of cooling water may be disturbed leading to overheating. Be sure to check before driving.
(3) Faulty adjustment of ignition timing
Faulty adjustment causes overheating and insufficient power output. Be sure to check before driving.

3–E–3. Too much Oil Consumption

Cause and Prevention

(1) Faulty air cleaner
Sucking of dust due to faulty air cleaner and element. Intrusion of dust causes premature wear of oil seal and gas seal leading to increased oil consumption, difficult starting and decreased power output.
(2) Deterioration of engine oil and use of poor quality oil
Use of deteriorated oil or poor quality oil accelerates the oil seal wear. Use specified oil and change oil for every race.

3–E–4. Engine Seizure

Cause and Prevention

(1) Deteriorated oil, insufficient oil, drop of oil pressure
Using specified oil, always maintain the oil level to the (F) mark and change oil for every race.
(2) Maximum permissible engine speed
If the engine speed beyond the maximum rpm is used for an extended period, heavy load is imposed on the bearings causing seizure. Therefore, strictly hold the engine speed under the maximum rpm.

3–E–5. Engine Flat Spot, Poor Output

Cause and Prevention

(1) Faulty carburettor setting
Change the carburettor setting of each kit within the range of #5 ~ #10 higher or lower depending upon the requirement.
(2) Float chamber fuel level fluctuation
While the oil tube connector is planted in the air horn case cover, when it is planted too far, it interferes with the float causing fluctuation. Check well and adjust.
(3) Improper adjustment of ignition timing
(4) Drop of compression pressure
Wear of gas seal due to dust sucked in. Check the engine condition well by taking measurement of the compression pressure before and after each race.

SPORTS KIT FOR CHASSIS AND BODY

4–A. EXPLANATION OF CHASSIS AND BODY KIT PARTS

4–A–1. Suspension System

(1) Damper (Front and Rear)

For improved handling and safety on the circuit, the damper characteristics are changed and at the same time the overall height of the car is lowered. Accordingly, the overall length and the stroke are shortened.

Specification

		Sport Kit	Standard
Front	Maximum Length	458.1 mm (18.04 in)	635.7 mm (25.03 in)
	Maximum Stroke	112.6 mm (4.43 in)	222.45 mm (8.76 in)
Rear	Maximum Length	475 mm (18.70 in)	570 mm (22.44 in)
	Maximum Stroke	130 mm (5.12 in)	177.25 mm (7.00 in)

(2) Front and rear coil springs

For improved handling and safety on the circuit, the spring constant is increased and the body height is lowered. Accordingly, the free length is shortened.

Specification

		Sport Kit	Standard
Front	Wire Diameter	11ϕ (0.43 in)	11ϕ (0.43 in)
	Free Length	228.0 mm (8.98 in)	339.5 mm (13.37 in)
	Spring Constant	3.3 kg/mm (185 lb/in)	1.851 kg/mm (101 lb/in)
Rear	Free Camber	7 ~ 8 mm (0.28~0.31 in)	132 mm (5.20 in)
	Spring Consatnt	3.3 kg/mm (185 lb/in)	2.0 kg/mm (112 lb/in)

(3) Stabilizer bar

For increased roll resistance in cornering, the spring constant of the stabilizer bar is changed.

Specification

	Sport Kit	Standard
Diameter	22ϕ (0.87 in)	22ϕ (0.87 in)
Spring Constant	1.92 kg/mm (108 lb/in)	1.31 kg/mm (73 lb/in)

(4) Bound bumper

For increased handling stability, the bound bumper free height is changed.

Note: The bound bumper should be use the modified parts.

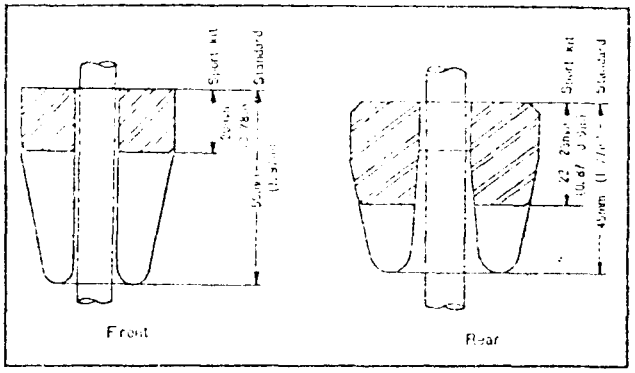


Fig. 4–1 Bound Bumper

(5) Spring pin and bush

For increased stiffness of the spring pin and the bush the diameter is changed from 8 mm (0.31 in) to 10 mm (0.39 in).

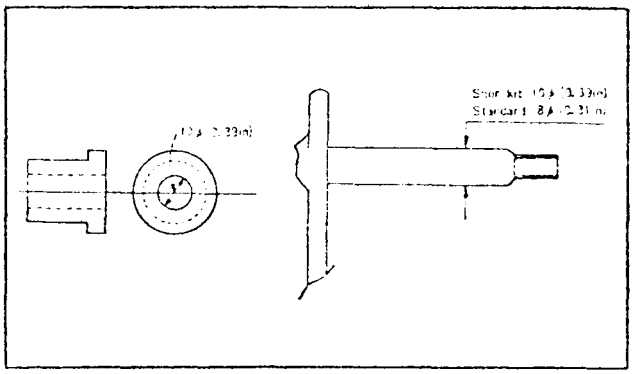


Fig. 4–2 Spring Pin and Bush

(6) Centering rubber

To prevent the moving of rear axle casing, the centering rubber is added a new.

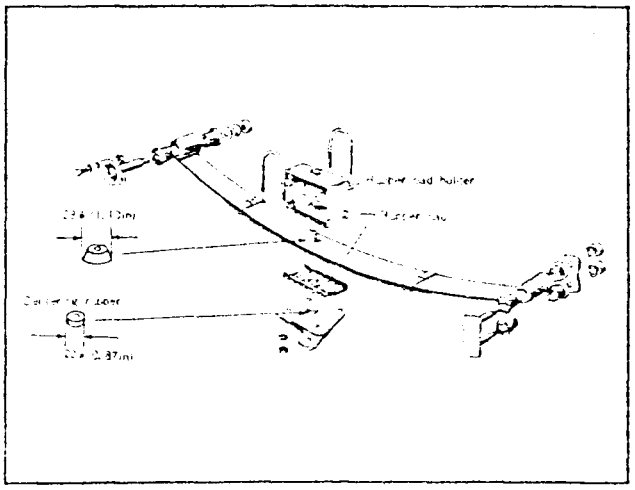


Fig. 4–3 Centering Rubber

4–A–2. Brake System

(1) Front disk pad and rear brake lining

For increased fade resistance of the pad and the lining, the material is changed to one with superior heat and wear resistance.

(2) Return spring and wheel cylinder boot

For increased heat resistance to hard braking, the material is changed.

4–A–3. Steering System

(1) Steering gear box

For increased handling on the circuit, the gear ratio is changed for better response.

Gear Ratio : 14.5:1 (Standard 17 ~ 19:1)

4–A–4. Body

(1) Over-fender

Larger fenders that can house wider tires are made available. The material is F.R.P. (Glass fiber)

(2) Tail wing and nose fin (Air spoiler)

Established for decreasing the air resistance by changing the air current to the car and increasing the road holding characteristics. The material is glass fiber.

(3) Wide rim (Disk Wheel)

9J-13 and 10J-13 are available for RX-3.

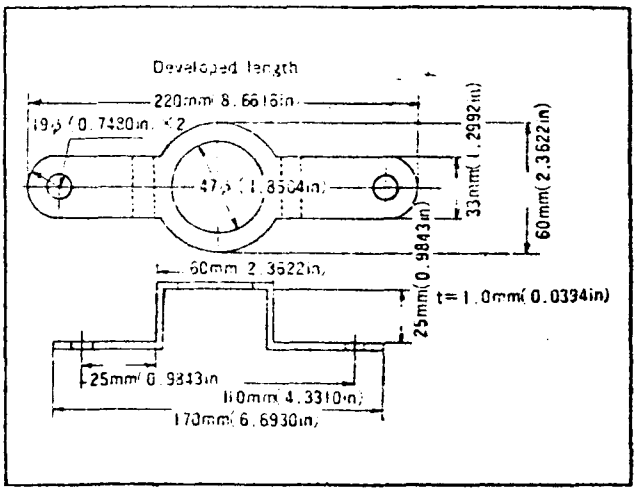


Fig. 4–4 Machining of Bearing Cap Lock Plate

4–B. MACHINING AND ATTACHING PROCEDURE

4–B–1. Machining of Bearing Cap Lock Plate

Machining is for preventing bearing seizure which is caused when bearing cap is dislodged and grease comes out at high speed running.

4–B–2. Machining and Attaching of Over-Fender

(1) Bend all fenders outward to ensure enough clearance between the tire and fender and prevent interference with each ohter, taking the maximum bound into consideration. Refer to Fig. 4–5.

(2) Fit over-fender to the body and drill holes at nine places for attaching it.

(3) Attach the over-fender and tighten it with nuts.

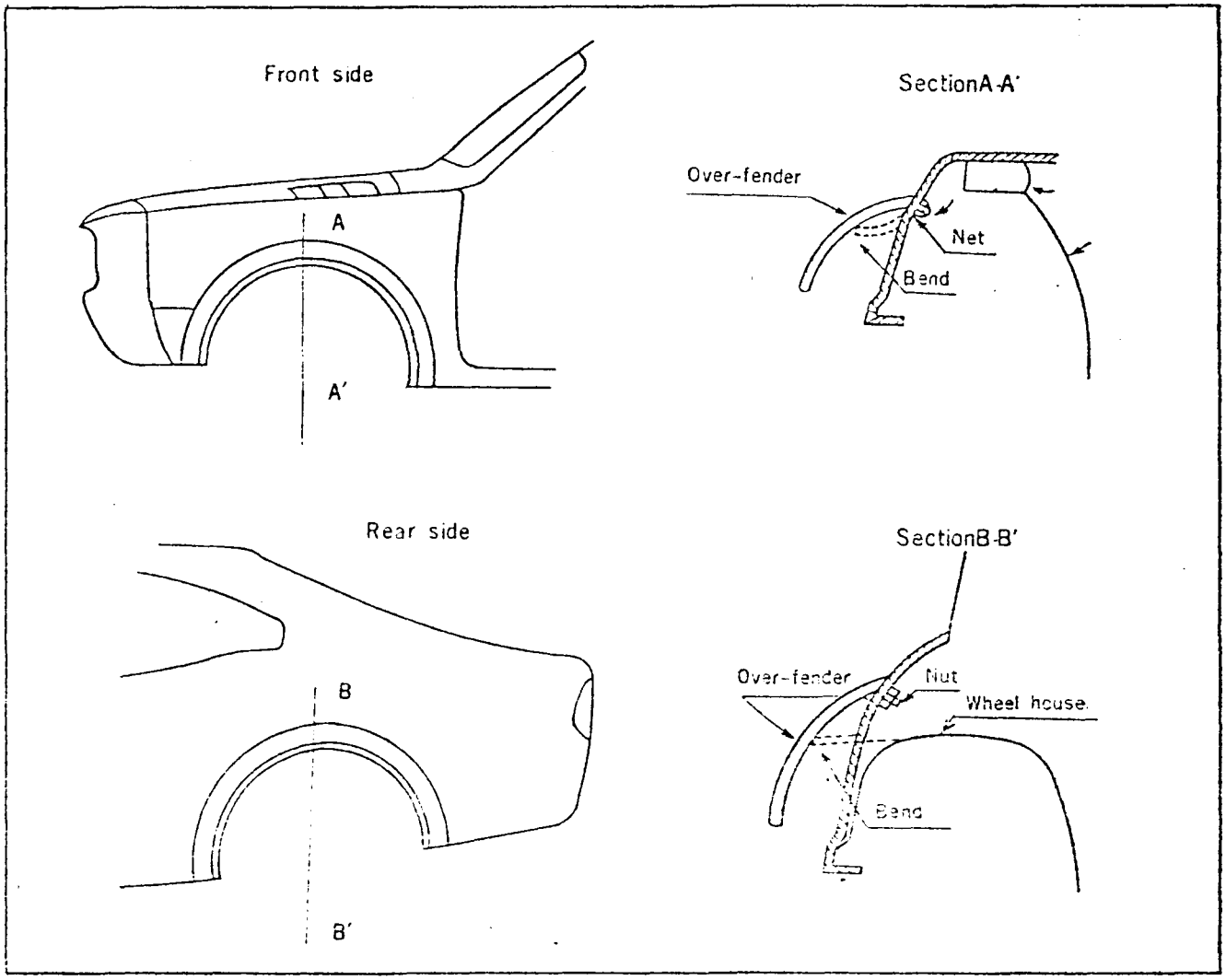


Fig. 4–5 Attaching of Over-Fender

(4) Rear over-fenders are attached in the same procedure as the front ones. Bolts for attaching over-fender are buried on the over-fender side. The intervals between bolts are about 135 mm (5.32 in), but as these intervals are not exactly equal, drill the body panel on the basis of the bolts imbedded in the over-fender.

Note: Total width after attaching over-fender should be less than specified value.

Front: 1,680 mm (66 in) Rear: 1,695 mm (67 in)

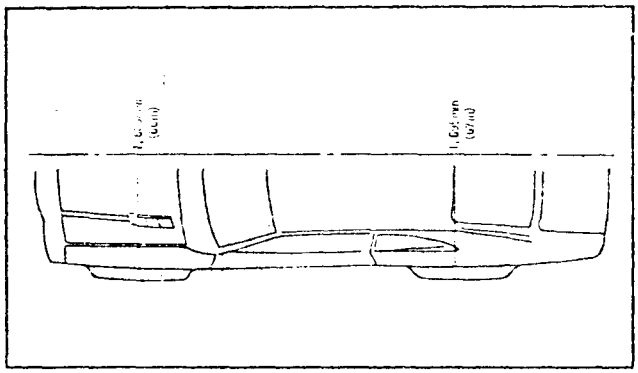


Fig. 4–6

4–B–3. Attaching Procedure of Tail Wing

(1) Drill holes in the rear trunk lid to attach the tail wing.

(2) Place the rubber packing between the trunk lid and bracket.

(3) Most effective set angle for tail wing is 20° ~ 23°.

(4) Adjust the set angle after loosening adjusting nuts.

(5) Measure the angle on the surface of tail wing.

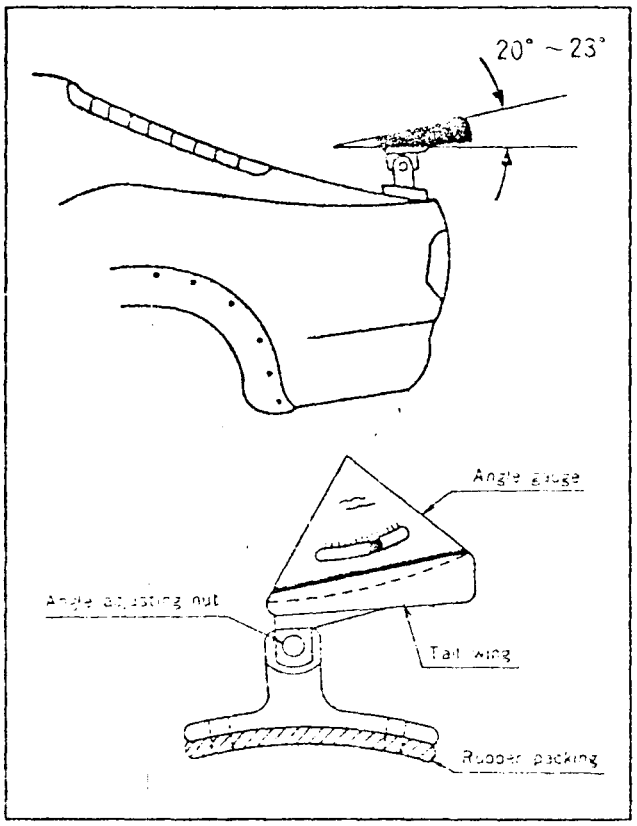


Fig. 4–7 Tail Wing Setting Angle

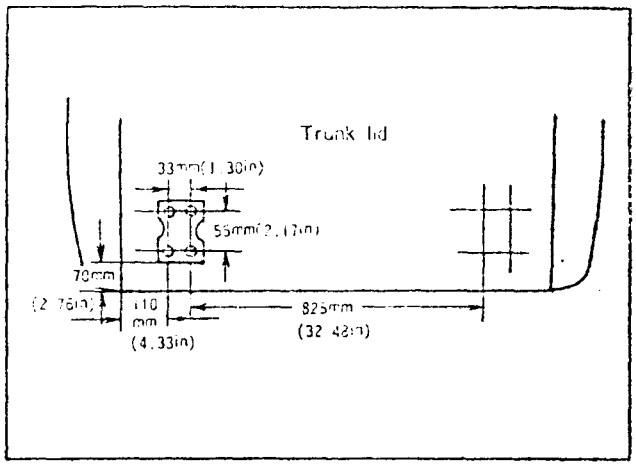


Fig. 4–8 Drilling of Tail Wing Holes

4–B–4. Nose Fin

(1) Fit nose fin to the front skirt and drill holes at three places for attaching it.

(2) Attach the nose fin and tighten it with nuts to an attaching angle of 60° ~ 65°.

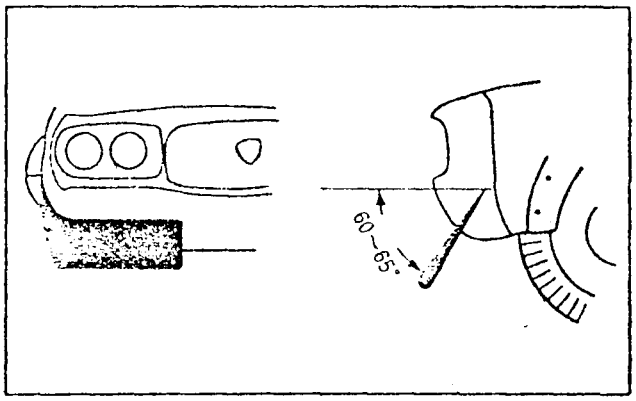


Fig. 4–9 Attaching of Nose Fin

4–B–5. Machining of Attaching Holes for Front Damper

(1) Adjust the camber angle by making the damper attaching holes (on mounting block side) 10 mm (0.39 in) longer towards outside.

(2) Lengthen holes by the round file.

(3) Holes should not be lengthened in the longitudinal direction.

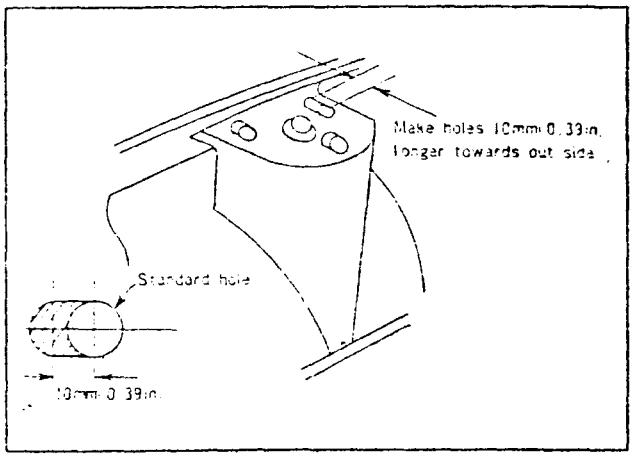


Fig. 4–10 Machining of Attaching Holes

Alignment Table

	Sport Kit	Standard
Camber	-20′~-1°	0°40′
Caster	8°40′~9°20′	1°15′
King Pin Inclination	10°	8°48′
Toe-in	0~out 5 mm (0~out 0.20 in)	0~6 mm (0~0.24 in)

4–B–6. Machining of Foot Step and Knee Support

(1) Position foot step and knee support in accordance to the position of driver.

(2) Attach foot step and knee support with bolts or by welding. (See Fig. 4–11)

(3) The foot step and the knee support can take any form as long as their purposes are met. (An example is shown in Fig. 4–12)

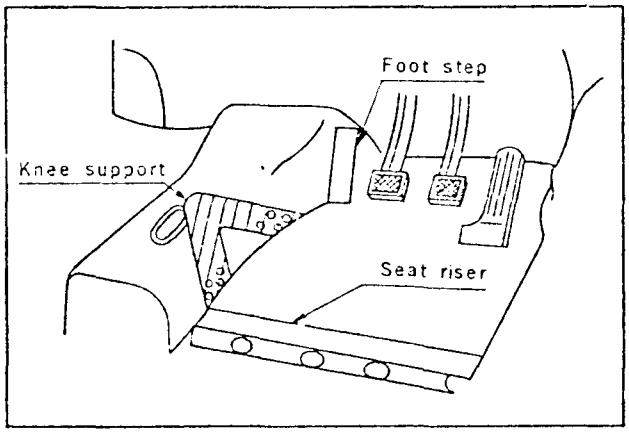


Fig. 4–11 Attaching Figure of Foot Step and Knee Support

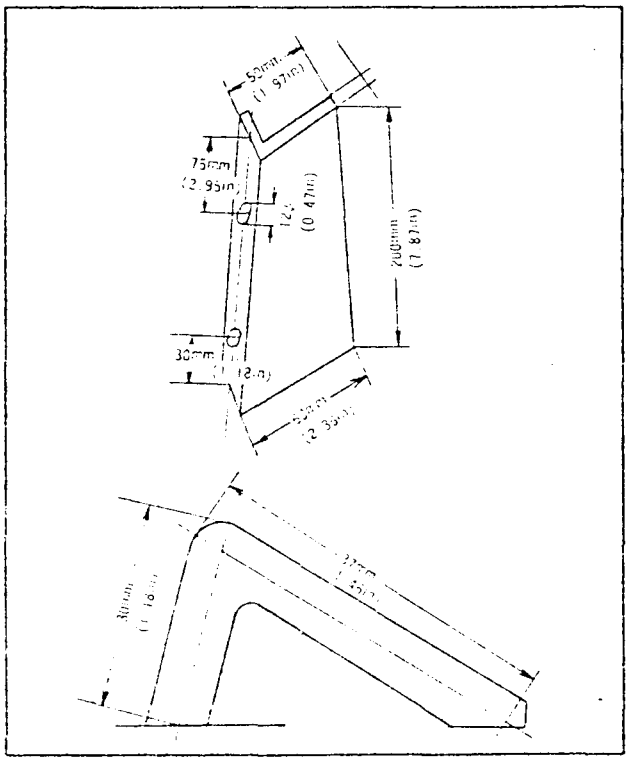


Fig. 4–12 An Example of Foot Step and Knee Support

4–B–7. Machining of Roll Bar

(1) Make the roll bar according to FIA regulation on competition cars.

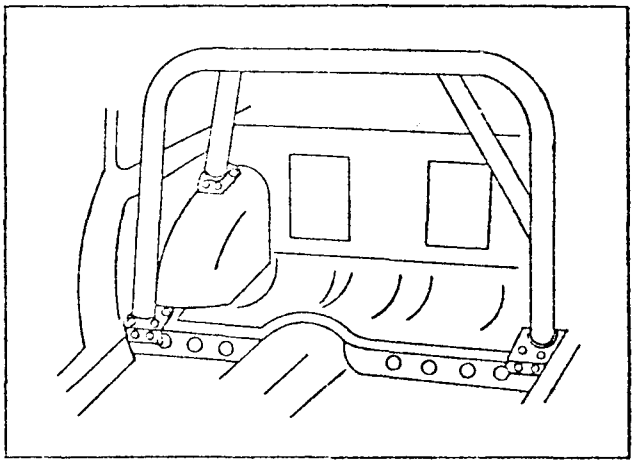


Fig. 4–13 Attaching Figure of Roll Bar

WORK PROCEDURE FOR CHASSIS AND BODY

5–A. SUSPENSION SYSTEM

5–A–1. Parts Needed for Suspension System
See the parts listed in this manual.

5–A–2. Removing, Disassembling, and Assembling
These procedures confirm to the procedure for standard vehicle.

5–A–3. Notes for Assembling
(1) Take care not to injure shaft of damper (front, rear).
(2) Fully inspect the front hub bearing to see that there is not injury.
(3) Use grease containing molybdenum disulfide for front bearing.
(4) Securely apply grease into front bearing.
(5) Bindking torque of front damper top nut is 6 ~ 7 kg-m (43 ~ 51 ft-lb).
(6) Check to see that front wheel bearing preload is 0.6 ~ 1.2 kg (13 ~ 26 lb) when measured with a spring balance hung on hub bolt.
(7) Carefully check to see that various portions are properly tightened.
(8) To install the centering rubber, rubber pad and the rubber pad holder should be taken away. Refer to Fig. 4–3.

5–B. STEERING SYSTEM

5–B–1. Parts Needed for Steering System
See the parts listed in this manual.

5–B–2. Removing, Disassembling and Installing
These procedures conform to the procedure for standard vehicle.

5–B–3. Wheel Alignment
(1) Adjustment of wheel alignment
Measure the wheel alignment according to the measuring procedure for standard vehicle.
Note: As the vehicle modified with sport kit is to be operated under substantially the same vehicle condition, make the wheel alignment with the fuel tank full and one person aboard.

5–C. BODY

5–C–1. Alteration
(1) Alter the body under the competition car regulation published by FIA.
(2) Regarding the attaching of over-fender, nose fin and tail wing, refer to the machining and attaching procedures herein.
(3) The authorized vehicle weight of RX-3 is 795 kg (1753 lb).

5–D. BRAKE SYSTEM

5–D–1. Parts Needed for Brake System
See the parts listed in this manual.

5–D–2. Removing, Disassembling and Installing
These procedures conform to the procedure for standard car.

5–D–3. Notes for Installing
(1) Make sure to prevent grease or dust from sticking to disk plate, pad, brake drum, brake shoe.
(2) Replace a deteriorated pipe.
(3) As the pipe and hose may possibly contact other parts when the vehicle height is lowered, carefully inspect, and increase the protector and clip bolt if necessary.
(4) Be sure to adjust the clearance between power brake push rod and master cylinder to the specified value rangin 0.1 ~ 0.5 mm (0.004 ~ 0.020 in).
(5) Remove the return spring of disk brake pad.
(6) The wheel cylinder cup rubber for sports kit is liable to be injured, so handle it carefully.

5–E. RACING TIRE

5–E–1. Selection of Tire
Select the tire to suit the extent of alteration on the body, the kind of race to take part in, and the condition of track.

5–E–2. Racing Tire and Rim Width
The best balanced condition in the relationship between the racing tire and rim is when the rim width is 80 as against 100 tire tread.

5–E–3. RX-3 and Tire Size
When the body is altered to attach the over-fender, the maximum tire size that can be mounted is 475/1150-13 (Front) and 475/1250-13 (Rear).

5–E–4. Notes about the Tire
(1) Tire pressure should conform to the value designated by tire maker.
(2) It is desirable to raise the tire pressure by 0.2 ~ 0.5 kg/cm^2 (28 ~ 71 lb/in^2) when the road surface is wet with rain water.
(3) In mounting the tire onto rim, take care to prevent foreign matters from entering into the tire.
(4) Properly balance the tire, and firmly fix the balance weight.
(5) Make sure to attach the valve cap.

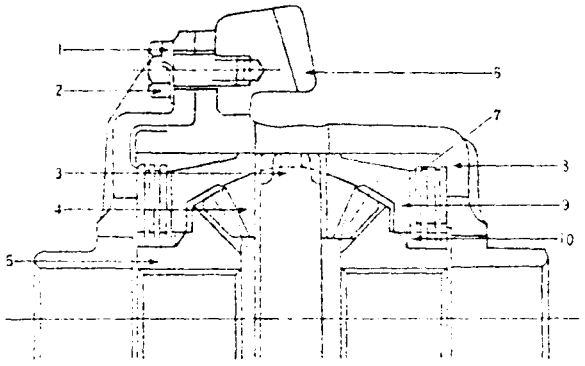
SPORTS KIT FOR DRIVING SYSTEM

6–A. EXPLANATION OF SPORT KIT PARTS

6–A–1. Differential System

(1) Limited slip differential

The limited slip differential is a Lock-O-Matic system, excellent performance of which has been proved in race in the past. This type is simple in structure with high efficiency.



1. Lock washer	6. Ring gear
2. Bolt	7. Friction plate
3. Pinion shaft	8. Differential case
4. Pinion gear	9. Pressure ring
5. Side gear	10. Friction disk

Fig. 6–1 Limited Slip Differential

(2) Final gear set

As suitable engine power and transmission gear ratio are selectable, so a final gear ratio to suit can be selected.

Comparison of Standard Specification and Sport Kit Specification

	Sport Kit	Standard
Limited Slip Differential	with equipped	——
Number of Pinion Gear	4	2
Numbre of Pinion Shaft	2	1
Differential Oil	Shell Heavy Duty 90#~140#	Long Life Hypoid Gear Oil
Final Gear Ratio	3.700 4.111 4.375 4.625 4.875	3.700

6–A–2. Propeller Shaft

(1) The propeller shaft has been beefed up to bear high-speed and high-load running, and the limit values of unbalance have been made smaller.

(2) Comparison of unbalance limit for standard and for sport kit are as follows:

	Sport Kit	Standard
Unbalance Limit	within 10 g/4,000 rpm	within 15 g/4,000 rpm

6–A–3. Clutch

(1) Clutch disk

The clutch disk can bear the harsh usage under high-speed, high-load condition and will hardly generate fade.

(2) Clutch cover ass'y

In order to eliminate the slippage of clutch under high-speed, high-load condition, the drive system has been changed to boss drive system with the set load raised to 420 kg (926 lb) from 290 kg (639 lb) (standard).

6–A–4. Transmission

4-speed and 5-speed transmissions are available to allow selection according to the condition of circuit.

(1) 4-speed unit (Shift pattern is the same as standard (Shift pattern is the same as standard one)

Close gear ratio is given. The standard case is used and only gear is repalced.

(2) 5-speed unit

The 5-speed gears have closer ratio with an over top. When install the transmission, it should be replace with the clutch and transmission assembly.

(3) Extension ass'y

Needle roller bearing with superior high speed durability is used as joint yoke bearing in the extension.

(4) Change lever

A gear shift lever made 2 mm (0.08 in) larger in diameter for higher rigidity is used. The knob of different material and structure is used to ensure against slipping out.

Comparison in Transmission Gear Ratio

Gear Ratio	Standard (4-speed)	Sport Kit	
		4-speed	5-speed
Low	3.737	2.104	2.340
2nd	2.202	1.608	1.695
3rd	1.435	1.240	1.278
Top	1.000	1.000	1.000
O, Top			0.890
Rev	4.024	2.266	2.266

6–B. MACHINING AND ATTACHING PROCEDURE

6–B–1. Machining of Oil Baffle

In racing, because centrifugal force makes differential oil move outward in the rear axle casing, it is necessary to

install the oil baffle to prevent the seizure of the final gear and the bearing etc.

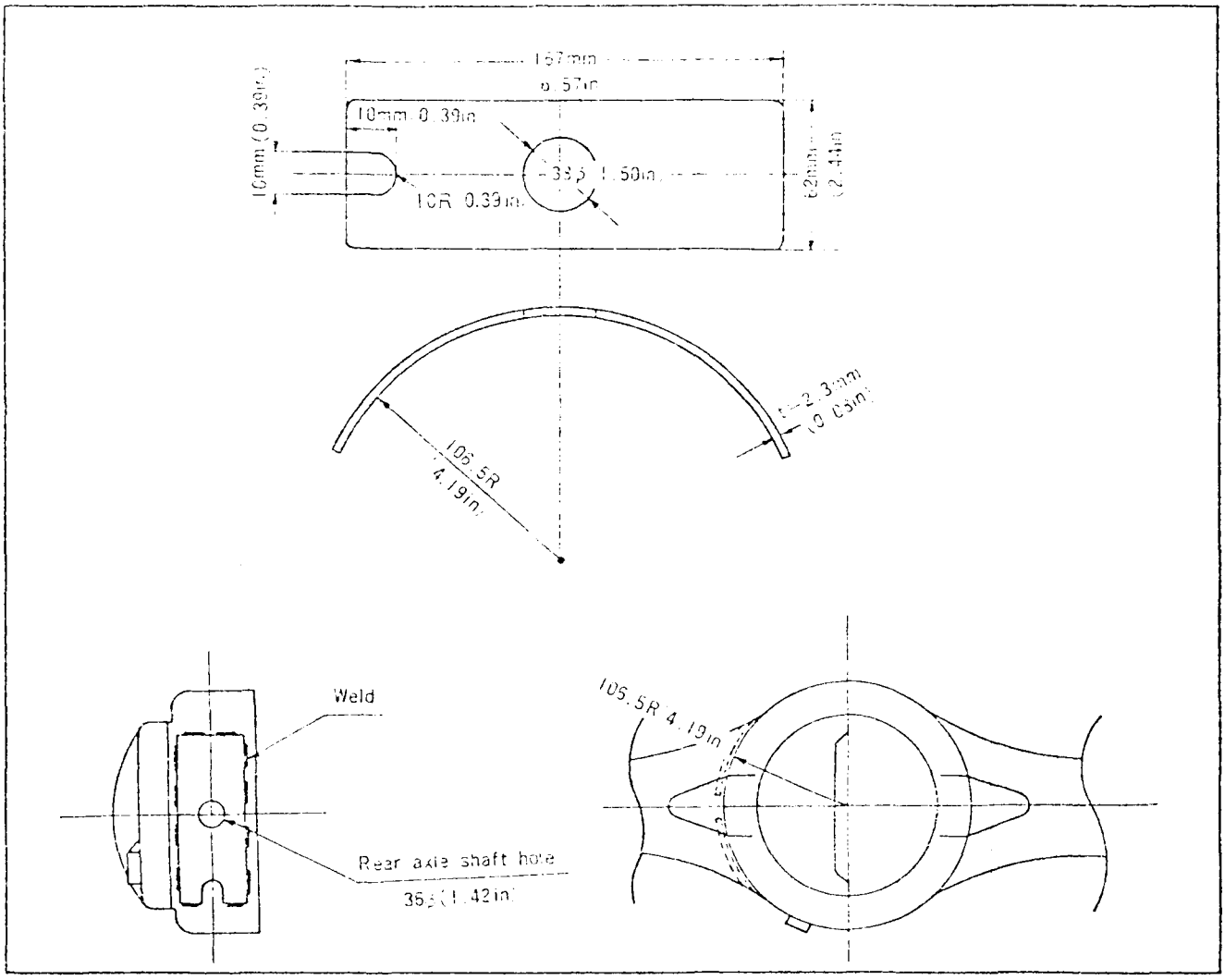


Fig. 6–2 Machining of Oil Baffle

6–B–2. Machining of Rear Axle Shaft

The end of the rear axle shaft would interfere with the pinion shaft of the limited slip differential. So cut off the rear axle shaft end by 5 mm (0.20 in) before installation.

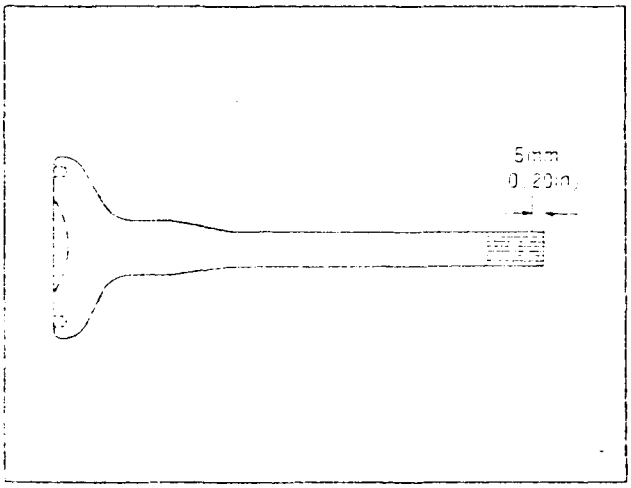


Fig. 6–3 Machining of Rear Axle Shaft

6–B–3. Installing of Clutch Pedal Stopper

Overstroke will cause the clutch diaphragm spring to creep affecting the clutch junction. The stopper is used to prevent this.

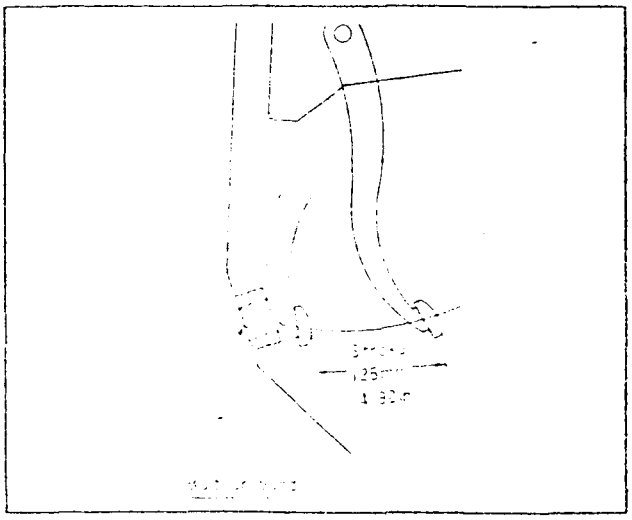


Fig. 6–4 Attaching of Pedal Stopper

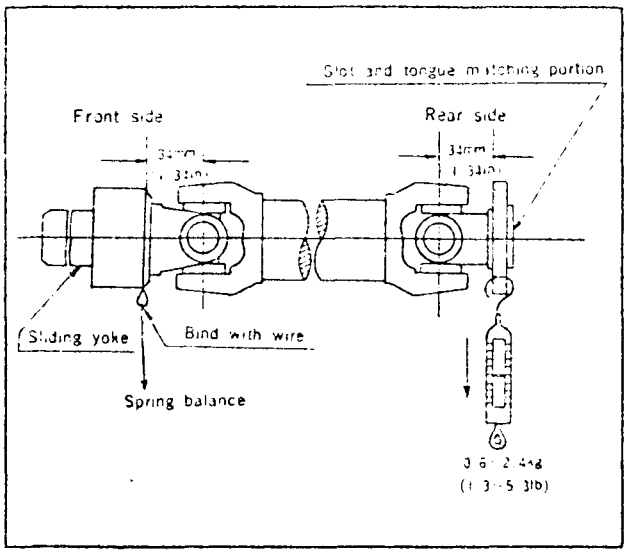


Fig. 7–2 Checking of Propeller Shaft Swinging Torque

7–D. TRANSMISSION

7–D–1. Parts Needed for Transmission

See the parts listed in this manual.

7–D–2. Disassembling of Transmission (4-speed unit)

(1) Separate the clutch housing and the transmission case.
(2) Remove the transmission case.
(3) Remove the packing off the case. Carefully wash the gears and bearings.
(4) Check the parts carefully and replace any worn or defaced parts. The following items should be checked with special care to ensure against gear slipping out; even slightly defective parts must be replaced with new ones.

a. Free length of shift lock spring
b. Wear of groove of shift fork rod ball notch.
c. Wear of shift fork and clutch hub sleeve.
d. Defacement and breakage of Synchronizer key spring.
e. Looseness of each bearing
f. Wear of synchronizer cone

7–D–3. Installing of Transmission (4-speed unit)

Make sure to observe the following matters:
(1) Install the shift fork on the shift fork rod and mount the idle gear making sure not to leave the interlock pin in the transmission case. Ensure against loosening of the setscrew of the shift fork by wiping any trace of oil off the threads and apply some locking agent there. {Tightening torque: 100 ~ 140 kg-cm (7 ~ 10 ft-lb)} Check for any looseness of the bearing stopper plate, etc.
(2) To prevent gear slip-out, insert a 2 mm (0.08 in) thick washer at each shift lock spring, thereby increasing the spring constant. (See Fig. 7–3)
(3) Install the modified gears on the main shaft. Check to see that gear bushing is well seated to the main shaft. Replace the lock wire with new one.
(4) Mount the main drive gear on the main shaft, taking care not to forget to attach the needle roller bearing. Install the drive gear together with the counter shaft gear into the transmission case, and check to see that each gear turns properly.
(5) Before tightening the transmission case, apply some sealing agent on its joint surfaces.
(6) The boot should be removed to ensure against gear slip-out.
(7) To wear in the transmission gears the maximum car speed should be held to 60 km/h (38 mile/h) for the first, 100 km (63 mile) and 100 km/h (63 mile/h) for the next 100 km (63 mile).

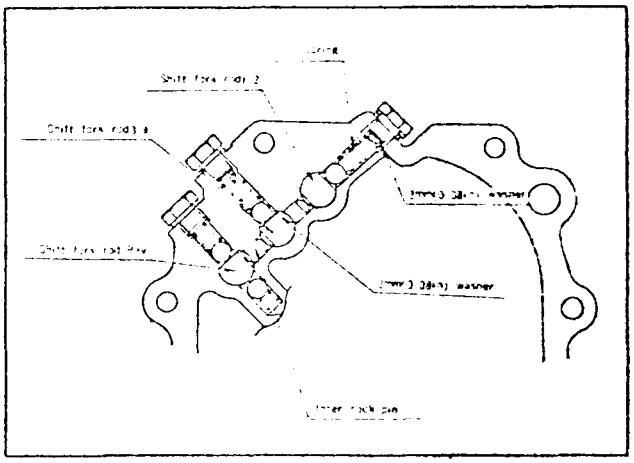


Fig. 7–3 Inserting Washer

7–D–4. Installing of Transmission (5-speed unit)

The 5-forward speed transmission is longer than standard one, so make sure to observe the following matter when installing.
1) Bend the front floor pan upward to ensure enough clearance between the clutch housing and the front floor pan and prevent interference with each other.
2) Move forward position of change lever attaching hole on the front floor pan.
3) Move backward position of transmission mount member.

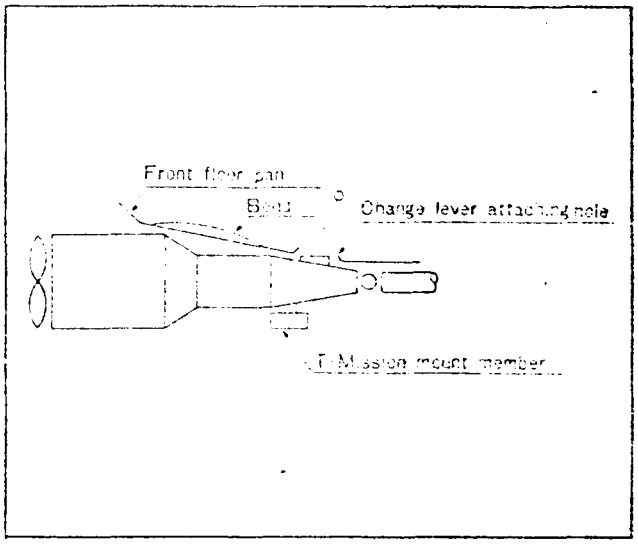
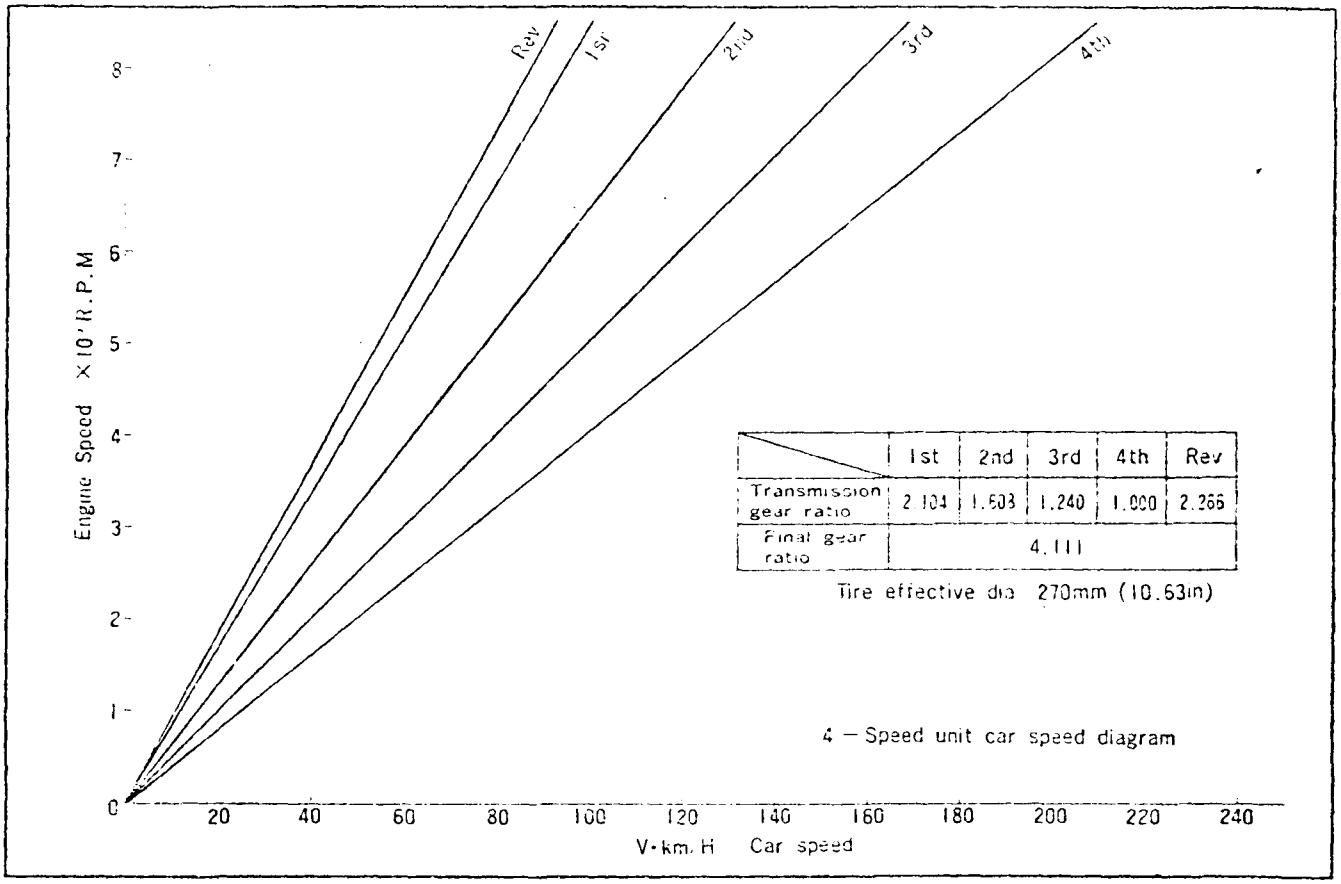


Fig. 7–4 Installing of Transmission

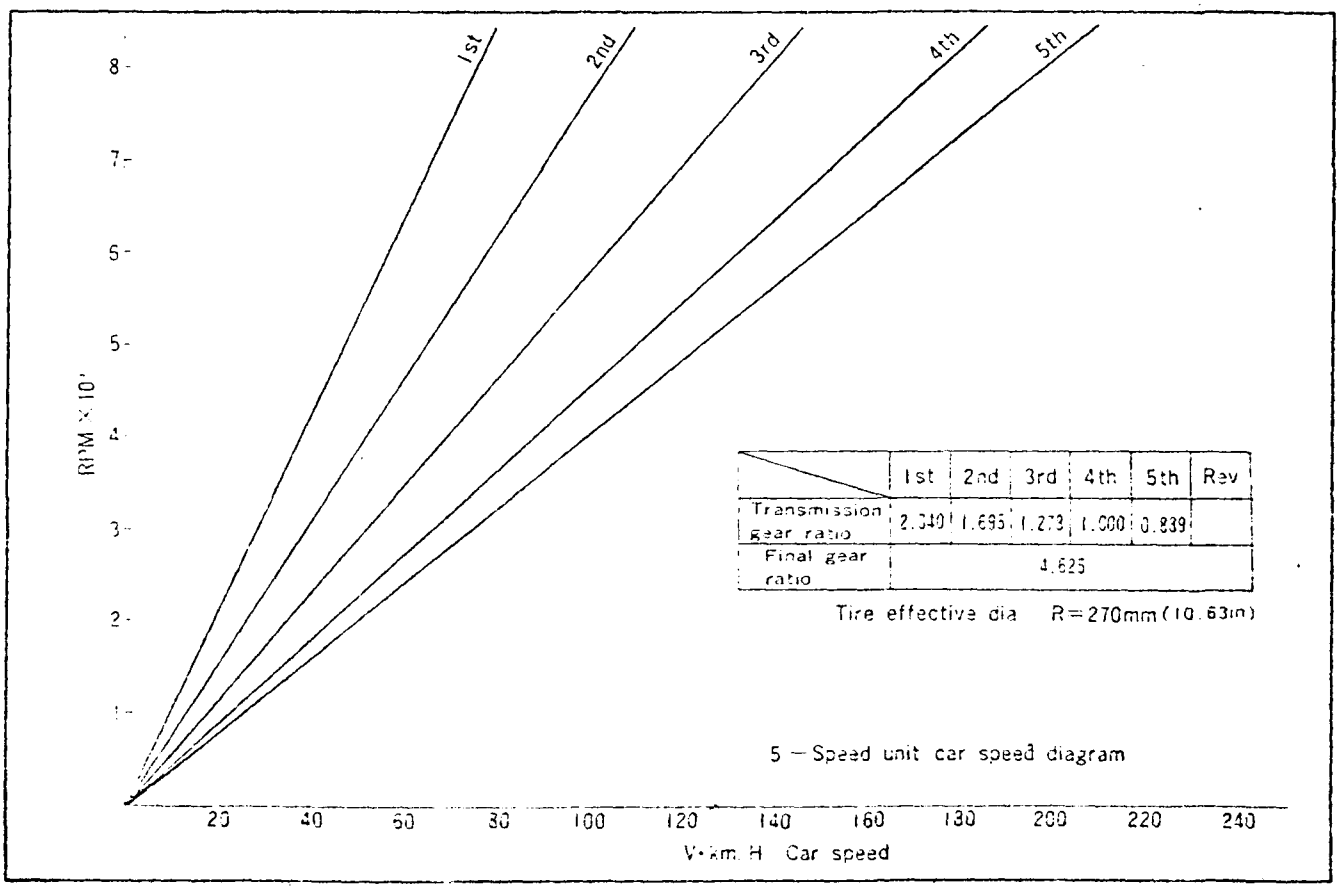
CAR SPEED DIAGRAM



	1st	2nd	3rd	4th	Rev
Transmission gear ratio	2.104	1.503	1.240	1.000	2.266
Final gear ratio	4.111				

Tire effective dia 270mm (10.63in)

4 — Speed unit car speed diagram



	1st	2nd	3rd	4th	5th	Rev
Transmission gear ratio	2.340	1.695	1.273	1.000	0.839	
Final gear ratio	4.625					

Tire effective dia R=270mm (10.63in)

5 — Speed unit car speed diagram