

Glossary of terms relating to manual transmission of automobiles

1. Scope

This standard specifies the terms relating to the manual transmission of automobiles except the motor-cycle (hereinafter referred to as "terms") and their definitions.

2. Classification

Classification of the terms shall be as follows:

(1) Terms for structural types

- (1.1) Manual transmission and its additional equipment
- (1.2) Classification by drive system of manual transmission
- (1.3) Classification by mounting arrangement of manual transmission
- (1.4) Classification by number of shift steps of manual transmission
- (1.5) Classification by shaft arrangement of manual transmission
- (1.6) Classification by engaging system of gears
- (1.7) Classification of synchronizing devices
- (1.8) Classification of power distributing devices by type
- (1.9) Classification of power distributing devices by working method
- (2) Terms for parts of components
- (2.1) Terms for parts of main transmission housing

(2.2) Terms for parts of main transmission gears

(2.3) Terms for parts of main transmission shifting system

(2.4) Terms for parts of four wheel drive control devices

(2.5) Terms for other parts

(3) Terms for performances and phenomena

(4) Terms for specifications

(5) Others

3. Terms and definitions

Terms and definitions shall be as follows:

Further, English equivalents, customary words and related materials are shown for reference. Furthermore, the customary words shall not be used hereafter.

Remarks

- 1: The words inside [] in the column of terms are usually omitted.
- 2: The letters inside () in the column of terms show how to read the term.
- 3: The terms which are described as "Reference" in the column of the numbers are the terms and definitions taken from the standards shown in the column of relating materials.

(1) Terms for structural types

(1.1) Manual transmission and its additional equipment

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1101	shudô hensokuki 手動変速機	A transmission which changes its gear ratio manually. Abbreviated as "MT" (Attached Fig.1 and 2)	manually shifted transmission, manual transmission, manual transaxle		SAE J 645
1102	huku hensokuki 副変速機	An auxiliary transmission which is connected to the main transmission and increases number of step stages. A certain auxiliary transmission is of independent type. (Attached Fig. 3)	sub transmission, auxiliary transmission		
1103	dôryoku bunpai sôchi 動力分配装	A device which distributes the power of a main transmission to front and rear wheels. A certain device has a sub transmission and a center differential device. (Attached Fig. 4)	transfer		
1104	dôryoku toridashi sôchi 動力取り出し装置	A device that takes off the engine power from a transmission, etc. to use the power besides vehicle driving. Abbreviated as "PTO." (Attached Fig. 11)	power take off		JIS D 0104

(1.2) Classification by drive system of manual transmission

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1201	maeoki enjin kôrin kudô gata 前置エンジン後輪駆動形	A manual transmission which transfers the engine power to rear wheels in the front engine vehicle. Abbreviated as "FR-type". (Attached Fig.5.1)	front engine rear wheel drive		
1202	maeoki enjin zenrin kudô gata 前置エンジン前輪駆動形	A manual transmission which transfers the engine power to front wheels in the front engine vehicle. Generally, the final reduction device is built-in. Abbreviated as "FF-type". (Attached Fig.5.2)	front engine front wheel drive		
1203	atooki enjin kôrin kudô gata 後置エンジン後輪駆動形	A manual transmission which transfers the engine power to rear wheels in the rear engine vehicle. Generally, the final reduction device is built-in. Abbreviated as "RR-type". (Attached Fig.5.3)	rear engine rear wheel drive		

(1.2) Classification by drive system of manual transmission (continued)

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1204	nakaoki enjin kôrin kudô gata 中置エンジン後輪駆動形	A manual transmission which transfers the engine power to rear wheels in the midship engine vehicle. Generally, the final reduction device is built-in. Abbreviated as "MR-type". (Attached Fig.5.4)	midship engine rear wheel drive		
1205	yonrin kudô gata 四輪駆動形	A manual transmission which has a power distributing device and drives four wheels of front and rear axles. Abbreviated as "4WD-type".	four wheel drive		
1206	sôrin kudô gata 総輪駆動形	A manual transmission which has a power distributing device and drives all wheels.	all wheel drive	zenrin kudô gata 全輪駆動形	

(1.3) Classification by mounting arrangement of manual transmission

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1301	tateoki gata 縦置形	A manual transmission of which shaft is arranged in the longitudinal direction of a vehicle. (Attached Fig. 1 and 6)	longitudinal		
1302	yokooki gata 横置形	A manual transmission of which shaft is arranged in the transverse direction of a vehicle. (Attached Fig. 2)	transverse		

(1.4) Classification by number of shift steps of manual transmission

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1401	san-dan [hensokuki] 3段 [変速機]	A manual transmission which has three shift steps. (Attached Fig. 1.1)	three speed		
1402	yon-dan [hensokuki] 4段 [変速機]	A manual transmission which has four shift steps. (Attached Fig. 1.2)	four speed		

(1.4) Classification by number of shift steps of manual transmission (continued)

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1403	go-dan [hensokuki] 5段 [変速機]	A manual transmission which has five shift steps. (Attached Fig. 1.3)	five speed		
1404	roku-dan [hensokuki] 6段 [変速機]	A manual transmission which has six shift steps.	six speed		
1405	nana-dan [hensokuki] 7段 [変速機]	A manual transmission which has seven shift steps.	seven speed		
1406	5 × 2dan [hensokuki] 5 × 2段 [変速機]	A manual transmission which has five shift steps for the main transmission and two shift steps for the sub transmission. (5 × 2 is a typical example, and there are 4 × 2, 6x2, 2x4 and so on.) (Attached Fig. 3)			
1407	ôbadoraibu tsuki オーバードライブ付	A manual transmission which has the gear ratio (4002) that the number of revolutions of the output shaft (2202) becomes larger than that of the input shaft (2201). Abbreviated as "with OD". Example: Five speed [manual] transmission with OD.	overdrive		SAE J 645
1408	ekisutorarô tsuki エキストラロー付	A manual transmission which has the extra large gear ratio over the normal range. Example: Five speed [manual] transmission with EL.	extra low		

(1.5) Classification by shaft arrangement of manual transmission

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1501	nyûshutsuryoku jiku dôshin gata 入出力軸同心形	A manual transmission which has a sub shaft and concentric input and output shafts. (Attached Fig. 1)			
1502	nyûshutsuryoku jiku heikô gata 入出力軸平行形	A manual transmission of which input and output shafts are parallel. (Attached Fig. 2 and 6)			

(1.6) Classification by engaging system of gears

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1601	sentaku shûdô shiki 選択しゅう動式	A structure which makes a gear slide on a shaft and makes it engage with another gear to transfer the power.	sliding selective type		
1602	jiyôji kamiai shiki 常時かみ合い式	A structure in which gears are always meshed and one side gear will be connected to the shaft to transfer the power.	constant-mesh type		
1603	dôki kamiai shiki 同期かみ合い式	A structure which has a synchronizing device to make speeds of the gear and the shaft equal among the constant-mesh type transmissions.	synchro-mesh type		

(1.7) Classification of synchronizing devices

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1701	konsutanto rôdo gata [dôki sôchi] コンスタントロード形 [同期装置]	A type which makes a cone clutch push with a constant force and makes it synchronized (Attached Fig. 7.1)	constant load cone synchronizer		
1702	inâsha rokku gata [dôki sôchi] イナーシャロック形 [同期装置]	A type which prevents the connection of the gear and the shaft until the synchronizing finishes. Borg-Wagner type and Pin type belong to this type, and Borg-Wagner type includes the single cone synchronizing, the multiple cone synchronizing (the double cone synchronizing, the triple cone synchronizing, etc.). (Attached Fig. 7.2, 7.3, 7.4 and 7.5).	inertia lock synchronizer		
1703	sâbo gata [dôki sôchi] サーボ形 [同期装置]	A type in which the self servo force acts by friction of a cone clutch and synchronizing will be advanced. Porsche type belongs to this type. (Attached Fig. 7.6)	servo synchronizer		

(1.8) Classification of power distributing devices by type

(1.8.1) Classification of power distributing devices by arrangement

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1801	hensokuki ittai gata 変速機一体形	A power distributing device which is integral with the main transmission. (Attached Fig. 4.1, 4.2, 4.3, 4.5 and 4.6)			
1802	hensokuki bunri gata 変速機分離形	A power distributing device which is separated from and is connected by a propeller shaft, etc. to the main transmission. (Attached Fig. 4.4)			

(1.8.2) Classification of power distributing devices by power take off

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1803	sutorêtosurû gata ストレートスルー形	A power distributing device in which the input shaft and the output shaft to drive rear wheels are concentric. (Attached Fig. 4.1 and 4.6)	straight through type		
1804	ofusetto gata オフセット形	A power distributing device in which the input shaft and the output shaft to drive rear wheels are offset. (Attached Fig. 4.2 and 4.4)	offset type		

(1.9) Classification of power distributing devices by working method

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
1901	kirikae shiki 切り換え式	A power distributing device which permits the change between two and four wheel drive manually or by switch. (Attached Fig. 4.1, 4.2, 4.3 and 4.4)	part-time four wheel drive		
1902	kotei bunpai gata jyôji yonrin kudô shiki 固定分配形常時四輪駆動式	A power distributing device which has a built-in center differential device, and always drives four wheels by achieving the constant torque distribution to the front and rear wheels. (Attached Fig. 4.5)	fixed torque distribution type full-time four wheel drive		
1903	kahen bunpai gata jy ôji yonrin kudô shiki 可変分配形常時四輪駆動式	A power distributing device which drives four wheels by achieving the variable torque distribution to the front and rear wheels. It includes the viscous coupling type, the hydraulic coupling type, the multi-plate clutch type, etc. (Attached Fig. 4.6)	variable torque distribution type full-time four wheel drive		

(2) Terms for parts of components

(2.1) Terms for parts main transmission housing

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
2101	kuracchi haujingu クラッチハウジング	A housing which holds the clutch. (Attached Fig. 8)	clutch housing		
2102	toransumishshon kēsu トランスミッションケース	A case which holds the main structural parts (gears, bearings, controls, etc.). Some are integral with the clutch housing. (Attached Fig. 8)	transmission case	misshon kēsu	
2103	ekusutenshon haujingu エクステンションハウジング	A housing which is fitted at rear end of the transmission case, and holds the output shaft, etc. (Attached Fig. 8)	extension housing		
2104	adaputa pur eto アダプタプレート	A plate which is inserted between a clutch housing and a transmission case or a transmission case and an extension housing, and holds the components. Also called as intermediate plate. (Attached Fig. 8)	adapter plate, intermediate plate		

(2.2) Terms for parts of main transmission gears

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
2201	inputto shafuto インプットシャフト	A shaft which inputs the power to a transmission. (Attached Fig. 1 and 2)	input shaft		
2202	autoputto shafuto アウトプットシャフト	A shaft which outputs the power to a transmission. (Attached Fig. 1.2 and 2)	output shaft	mein shafuto	
2203	kaunta giya カウンタギヤ	A generic name of the gears which engage with gears on the input and output shafts. (Attached Fig. 1.2)	counter shaft cluster gear		
2204	kaunta shafuto カウンタシャフト	A shaft which holds the counter gears.	counter shaft		
2205	fāshuto autoputto giya 1ST アウトプットギヤ	The first speed gear which is arranged on the output shaft. (Attached Fig. 1.2 and 2)	first speed output gear		

(2.2) Terms for parts of main transmission gears (continued)

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
2206	sekando autoputto giya 2ND アウトプットギヤ	The second speed gear which is arranged on the output shaft. (Attached Fig. 1.2 and 2)	second speed output gear		
2207	sâdo autoputto giya 3RD アウトプットギヤ	The third speed gear which is arranged on the output shaft. (Attached Fig. 1.2 and 2)	third speed output gear		
2208	fôsu autoputto giya 4TH アウトプットギヤ	The fourth speed gear which is arranged on the output shaft. (Attached Fig. 2).	fourth speed output gear		
2209	fifusu autoputto giya 5TH アウトプットギヤ	The fifth speed gear which is arranged on the output shaft. (Attached Fig. 1.3 and 2)	fifth speed output gear		
2210	sikkususu autoputto giya 6TH アウトプットギヤ	The sixth speed gear which is arranged on the output shaft.	sixth speed output gear		
2211	sebunsu autoputto giya 7TH アウトプットギヤ	The seventh speed gear which is arranged on the output shaft.	seventh speed output gear		
2212	ribâsu autoputto giya リバースアウトプットギヤ	A reverse gear arranged on the output shaft. (Attached Fig. 1.2 and 2)	reverse output gear		
2213	ribâsu aidora giya リバースアイドルギヤ	An intermediate gear which engages with the reverse output gear and the counter gear or the gears on the input shaft. (Attached Fig. 1.1)	reverse idler gear		
2214	ribâsu aidora giya shafuto リバースアイドルギヤシャフト	A shaft which holds the reverse idler gear. (Attached Fig. 1.1)	reverse idler gear shaft		
2215	sâdo inputto giya 3RD インプットギヤ	The third speed gear arranged on the input shaft. (Attached Fig. 2)	third speed input gear		

(2.2) Terms for parts of main transmission gears(continued)

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
2216	fôsu inputto giya 4TH インプットギヤ	The fourth speed gear arranged on the input shaft. (Attached Fig. 2)	fourth speed input gear		
2217	fifusu inputto giya 5TH インプットギヤ	The fifth speed gear arranged on the input shaft. (Attached Fig. 2)	fifth speed input gear		
2218	ekisutra rô giya エキストラローギヤ	A gear for the extra low speed arranged on the output shaft.	extra low gear		
2219	shinkuronaiza ringu シンクロナイザリング	A ring which has the friction surface for synchronizing. (Attached Fig. 9)	synchronizer ring		
2220	kuracchi habu クラッチハブ	A member which is fixed on the output shaft or the input shaft, etc. and transfers the power between the clutch sleeve. It is also referred to as the synchronizing hub. (Attached Fig. 9)	clutch hub		
2221	kuracchi surîbu クラッチスリーブ	A member which slides on the clutch hub to connect and disconnect the power. (Attached Fig. 9)	clutch sleeve		
2222	shinkuronaiza kî シンクロナイザキー	A key which is inserted between the clutch hub and the clutch sleeve. (Attached Fig. 9)	synchronizer key		
2223	shinkuronaiza kî supuringu シンクロナイザキースプリング	A spring which pushes the synchronizer key to clutch sleeve from the inside. (Attached Fig. 9)	synchronizer key retaining spring		

(2.3) Terms for parts of main transmission shifting system

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
2301	shifuto fôku シフトフォーク	A member which moves the clutch sleeve or the gear in the axial direction. (Attached Fig.10)	shift fork		JIS D 0109
2302	fôku shafuto フォークシャフト	A shaft which supports the shift fork. It is also referred to as the fork rod. (Attached Fig. 10)	shift rail, shift fork shaft		

(2.4) Terms for parts of four wheel drive control devices

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
2401	toransufa kēsu トランスファケース	A case which stores and holds the gears and operating mechanisms for the four wheel drive. (Attached Fig. 4.2 and 4.4)	transfer case		
2402	furonto autoputto shafuto フロントアウト プットシャフト	A shaft to drive the front wheels. (Attached Fig. 4.1, 4.2 and 4.4)	front output shaft		
2403	riya autoputto shafuto リアアウトプット シャフト	A shaft to drive the rear wheels. (Attached Fig. 4.1, 4.2 and 4.4)	rear output shaft		

(2.5) Terms for other parts

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
2501	ribāsu[ranpu] suicchi リバース [ランプ] スイッチ	A switch to detect the gear shifted to the reverse position. It is also referred to as the back up (lamp) switch. (Attached Fig. 3.2)	back up lamp switch		
2502	ea buriza エアブリーザ	An air vent or breather between the inside of the transmission and the outside air. (Attached Fig. 2 and 3.2)	air breather		
2503	doren puragu ドレンプラグ	A plug which fills the oil drain. (Attached Fig. 8)	drain plug		
2504	fira puragu フィラプラグ	A plug which fills the oil filler. (Attached Fig. 8)	filler plug		
2505	supīdomēta doraibu giya スピードメータ ドライブギヤ	A gear to detect the vehicle speed. (Attached Fig. 2 and 3.2)	speedometer drive gear		
2506	supīdomēta doribun giya スピードメータ ドリブンギヤ	A gear which engages with the speedometer drive gear and drives the speedometer. (Attached Fig. 2 and 3.2)	speedometer driven gear		

(3) Terms for performances and phenomena

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
3001	seiteki shifuto[s-ôsa] ryoku 静的シフト [操作] 力	The shifting force on the shift lever knob at shifting under the conditions that the vehicle and engine are stopped, and the clutch is disengaged. (Attached Fig. 12)	static shifting force		JASO C 203
3002	dôteki shifuto [sôsa]ryoku 動的シフト [操作] 力	The shifting force on the shift lever knob at shifting under the conditions that the engine is running and the vehicle is stopped or running. (Attached Fig. 13)	dynamic shifting force		JASO C 203
3003	shifuto jikan シフト時間	The time between the shift starting point and the slide finishing point. (Attached Fig. 13)	shifting time		JASO C 203
3004	shifuto sutorôku シフトストローク	The distance between the neutral and each shift position. It is generally shown by the distance that the shift lever knob is moved. (Attached Fig. 12)	shift stroke		JASO C 203
3005	shifuto rikiseki シフト力積	The time integral value of the dynamic shift force between the shift starting point and the slide finishing point. It is used for the evaluation of synchronizing performance. (Attached Fig. 13) $\int_{t_1}^{t_2} F dt$ where, F : Dynamic shift force t_1 : Shift starting point t_2 : Slide finishing point	shift impulse		JASO C 203
3006	ni - dan iri 2段入り	The phenomena that the peak of the shifting force is felt to the hand when the gear side spline engages with the clutch sleeve spline before the finish of the shift. (Attached Fig. 13)			
3007	giya nari ギヤ鳴り	The phenomena that noise is generated when the clutch sleeve spline or the gear engages during shifting.	gear clash		
3008	[shudô hensokuki no] kyoyô nyûryoku toroku [手動変速機の] 許容入力トル	The allowable input torque for a manual transmission including fatigue.	allowable input torque		

(3) Terms for performances phenomena (continued)

No.	Term	Definition	Reference		
			English equivalent	Customary term	Related standard
3009	[shudô hensokuki no] kyoyô ny ûryoku kaiten sokudo [手動変速機の] 許容入力回転速度	The functionally allowable input speed for a manual transmission in relation to strength, vibration, lubrication, etc.	allowable input speed		
3010	[haguruma no] gatauchi on [歯車の] がた打ち音	Rattling noise generated between the engaged gears because of the fluctuations of the engine speed.	rattling noise, gear rattle	hauchi on	
3011	taito kôna burêki タイトコーナブレーキ	Braking phenomena generated from the difference between mean turning radii of the front and rear wheels, during the turning at the four wheel or all wheel drive vehicle without the differential gear between front and rear wheels. It is also referred to as the tight corner braking.	tight cornering brake		
3012	giya nuke ギヤ抜け	The phenomena that the spline or the gears of the clutch sleeve are disengaged during the traveling, and the shift is returned to the neutral condition.	jump out		
Ref. (3.1)	[haguruma no] kamiai on [歯車の] かみ合い音	The noise generated from the gear precision, fitting error, elastic deformation by the load, etc., when the gears are engaged.	gear noise		JASO Z 212
Ref. (3.2)	haatari 歯当たり	Shapes, sizes and locations of contact portions of both gears, generated during the engagement of a pair of gears.	tooth bearing tooth contact		JASO Z 212