

## ECLA EUROPEAN CLASSIFICATION

### E02F DREDGING; SOIL-SHIFTING (winning peat [E21C49/00](#))

[N: **WARNING**  
[C1205]

1. The following IPC groups are not used in the internal ECLA classification scheme. Subject matter covered by these groups is classified in the following ECLA groups:

<a href="#">E02F3/32</a>	covered by	<a href="#">E02F3/30</a> , <a href="#">E02F3/42D</a>
<a href="#">E02F3/39</a>	covered by	<a href="#">E02F3/28S2</a> , <a href="#">E02F3/30K</a> , <a href="#">E02F3/34K</a>
<a href="#">E02F3/78</a>	" "	<a href="#">E02F7/76</a> + s.gr.
<a href="#">E02F3/85</a>	" "	<a href="#">E02F3/84A</a> , <a href="#">E02F3/84A2</a> , <a href="#">E02F3/84B</a> ,
<a href="#">E02F3/84B2</a> ,		<a href="#">E02F3/84B4</a>
<a href="#">E02F5/04</a>	" "	<a href="#">E21B</a>
<a href="#">E02F5/06</a>	" "	<a href="#">E02F3/08</a>
<a href="#">E02F5/08</a>	" "	<a href="#">E02F3/18</a>
<a href="#">E02F5/16</a>	" "	<a href="#">E21B</a>
<a href="#">E02F5/18</a>	" "	<a href="#">E21B</a>
<a href="#">E02F5/20</a>	" "	<a href="#">E21B</a>

]

#### **Note**

This subclass covers :

- primarily equipment for excavating or loosening earth or for moving loose earth;
- equipment for working similarly on other materials and similar equipment for loading or unloading materials

**E02F1/00** General working methods with dredgers or soil-shifting machines (methods for making embankments [E02D17/18](#); methods for mining [E21C](#))

**E02F3/00** Dredgers; Soil-shifting machines (for special purposes [E02F5/00](#); other machines or apparatus for mining [E21C](#); tunnelling [E21D](#))

**E02F3/02** . hand-operated; [N: handheld soil shifting equipment acting by sucking [E02F3/88K](#) (spades or rakes for agriculture or gardening purposes [A01B](#))] [\[N1204\]](#)

**E02F3/04** . mechanically-driven

**E02F3/04B** . . [\[N: with oscillating digging tools, e.g. oscillating spades\]](#)

**E02F3/06** . . with digging screws [N: (earth drilling [E21](#); for digging trenches or ditches [E02F5/04](#))] [\[N1204\]](#)

**E02F3/08** . . with digging elements on an endless chain, [N: e.g. bucket-type chains (for digging trenches or ditches [E02F5/06](#); cutting machines for mining or quarrying [E21C25/22](#))] [\[N1204\]](#)

**E02F3/08A** . . . [\[N: mounted on floating substructures \(floating substructures per se \[E02F9/06\]\(#\)\)\]](#)

**E02F3/08C** . . . [N: including a belt-type conveyer for transporting the excavated material] [\[N1204\]](#)

**E02F3/08E** . . . [N: including a screw-type conveyer for transporting the excavated material]

				N1204]
E02F3/08G	.	.	.	[N: with auxiliary or additional digging elements other than digging elements on an endless chain] [N1204]
E02F3/08M	.	.	.	[N: vertically shiftable relative to the frame] [N1204]
E02F3/08R	.	.	.	[N: with digging unit working in a plane inclined to the direction of travel] [N1204]
E02F3/08T	.	.	.	[N: pivotable relative to the frame] [N1204]
E02F3/10	.	.	.	with tools that only loosen the material, [N: i.e. with cutter-type chains] [C9506]
E02F3/12	.	.	.	Component parts [N: e.g. bucket troughs]
E02F3/14	.	.	.	Buckets; Chains; Guides for buckets or chains; Drives for chains [N: not used, see subgroups] [C9506]
E02F3/14B	.	.	.	[N: buckets]
E02F3/14F	.	.	.	[N: tools mounted on buckets or chains which loosen the soil, e.g. cutting wheels, or the like (teeth per se E02F9/28)]
E02F3/14G	.	.	.	[N: chains; chain links; scraper chains (chains or chain guides E21C25/28)] [N1204]
E02F3/14H	.	.	.	[N: emptying or cleaning the buckets, e.g. in combination with spoil removing equipment]
E02F3/14J	.	.	.	[N: drives]
E02F3/14M	.	.	.	[N: guides for chains or buckets, e.g. for buckets movable relative to chains (chains or chain guides E21C25/28)] [N1204]
E02F3/14S	.	.	.	[N: arrangements for the co-operation between buckets or buckets and wheels] [N9506]
E02F3/14W	.	.	.	[N: wheels, sprockets] [N9506]
E02F3/16	.	.	.	Safety or control devices (safety devices in general F16P; controlling in general G05)
E02F3/18	.	.	.	with digging wheels turning round an axis, [N: e.g. bucket-type wheels (for digging trenches E02F5/08; for laying cables underwater E02F5/10P12; cutting machines E21C25; methods or apparatus for making tunnels or galleries E21D9)] [N1204]
E02F3/18B	.	.	.	[N: including a conveyer] [N1204]
E02F3/18D	.	.	.	[N: with digging unit shiftable relative to the frame] [N1204]
E02F3/18F	.	.	.	[N: with digging unit mounted in a plane which is inclined to the direction of travel; with tools digging laterally with respect to the frame] [N1204]
E02F3/18G	.	.	.	[N: with the axis being substantially parallel to the direction of travel] [N1204]
E02F3/18H	.	.	.	[N: with the axis being horizontal and transverse to the direction of travel] [N1204]
E02F3/20	.	.	.	with tools that only loosen the material, [N: i.e. mill-type wheels] [C9605]
E02F3/20F	.	.	.	[N: with a pair of digging wheels, e.g. slotting machines (implements for making foundation slots with definition of the walls or foundations E02D17/13; bulkheads or similar walls made solely of concrete in situ E02D5/18; with a pair of buckets E02F3/47B)] [N1204]
E02F3/22	.	.	.	Component parts
E02F3/24	.	.	.	Digging wheels; Digging elements of wheels; Drives for wheels
E02F3/24B	.	.	.	[N: digging wheels]
E02F3/24C	.	.	.	[N: wheels rotatable in both directions]
E02F3/24D	.	.	.	[N: with digging elements mounted movable relative to the wheel]
E02F3/24G	.	.	.	[N: drives]

E02F3/24K	. . . . .	[N: Cleaning the wheels or emptying the digging elements mounted on the wheels, e.g. in combination with spoil removing equipment] [N1204]
E02F3/26	. . . . .	Safety or control devices (safety devices in general <a href="#">F16P</a> ; controlling in general <a href="#">G05B</a> )
E02F3/28	. . . . .	with digging tools mounted on a dipper- or bucket-arm, [N: i.e. there is either one arm or a pair of arms], e.g. dippers, buckets
E02F3/28S	. . . . .	[N: with a single arm pivoted directly on the chassis (linkage mechanism for it E02F3/34L)] [N1204]
E02F3/28S2	. . . . .	[N: telescopic or slidable (fork-lift trucks with a telescopic boom B66F9/065T)] [N1204]
E02F3/30	. . . . .	with a dipper-arm pivoted on a cantilever beam, [N: i.e. boom]
E02F3/30A	. . . . .	[N: with more than two arms (boom included), e.g. two-part boom with additional dipper-arm] [N1204]
E02F3/30B	. . . . .	[N: with an additional link] [N9603]
E02F3/30D	. . . . .	[N: with the dipper-arm or boom rotatable about its longitudinal axis] [N1204]
E02F3/30F	. . . . .	[N: with the dipper-arm slidably mounted on the boom (E02F3/30G takes precedence)] [N1204]
E02F3/30G	. . . . .	[N: with the dipper-arm slidably mounted on the boom and the boom slidably mounted on the frame]
E02F3/30K	. . . . .	[N: with telescopic dipper-arm or boom] [N1204]
E02F3/30L	. . . . .	[N: the boom and the dipper-arm being connected so as to permit relative movement in more than one plane]
E02F3/30P	. . . . .	[N: working outwardly] [N1204]
E02F3/32	. . . . .	working downwardly and towards the machine, e.g. with backhoes
E02F3/32B	. . . . .	[N: Backhoes of the miniature type] [N1204]
E02F3/34	. . . . .	with bucket-arms [N: i.e. a pair of arms, e.g. manufacturing processes, form, geometry, material of bucket-arms (with a single arm E02F3/28S)] directly pivoted on the frames of tractors or self-propelled machines [N1204]
E02F3/34K	. . . . .	[N: the arms being telescopic (fork-lift trucks with a telescopic boom B66F9/065T)] [N1204]
E02F3/34L	. . . . .	[N: and comprising an additional linkage mechanism]
E02F3/34L2	. . . . .	[N: of the parallelogram-type]
E02F3/34L4	. . . . .	[N: of the Z-type]
E02F3/34P	. . . . .	[N: the arms being pivoted at the rear of the vehicle chassis, e.g. skid steer loader] [N1204]
E02F3/34T	. . . . .	[N: Buckets emptying by tilting ( <a href="#">E02F3/342</a> , <a href="#">E02F3/345</a> take precedence)]
E02F3/342	. . . . .	Buckets emptying overhead ( <a href="#">E02F3/348</a> to <a href="#">E02F3/358</a> take precedence)
E02F3/345	. . . . .	Buckets emptying side-ways ( <a href="#">E02F3/348</a> to <a href="#">E02F3/358</a> take precedence)
E02F3/348	. . . . .	Buckets emptying into a collecting or conveying device
E02F3/348B	. . . . .	[N: Buckets discharging on a conveyer or elevator mounted on the machine]
E02F3/348D	. . . . .	[N: Buckets discharging overhead into a container mounted on the machine]
E02F3/352	. . . . .	Buckets movable along a fixed guide
E02F3/355	. . . . .	Buckets connected to the rear end of a tractor [N: not used]
E02F3/358	. . . . .	Bucket-arms pivoted on a turntable being part of a tractor frame [N: or buckets arranged on a turntable supported by the arms]

E02F3/36	. . .	Component parts
E02F3/36C	. . . .	[N: Devices to connect tools to arms, booms or the like] [N1204]
E02F3/36C2	. . . . .	[N: of the quick acting type, e.g. controlled from the operator seat (quick-acting couplers to connect booms or arms to tractors E02F3/627; quick-acting couplers for machines mounted on tractor A01B59/06; couplings of the quick-acting type per se F16L37)] [N1204]
E02F3/36C2A	. . . . .	[N: with means for absorbing any play therebetween (E02F3/36C2M takes precedence)] [N1204]
E02F3/36C2C	. . . . .	[N: with two separating hooks] [N1204]
E02F3/36C2E	. . . . .	[N: with a hook and a locking element acting on a pin] [N1204]
E02F3/36C2G	. . . . .	[N: with a hook and a longitudinal locking element] [N1204]
E02F3/36C2J	. . . . .	[N: with a hook and a transversal locking element] [N1204]
E02F3/36C2K	. . . . .	[N: using two or four movable transversal pins] [N1204]
E02F3/36C2M	. . . . .	[N: using wedges] [N1204]
E02F3/36C2N	. . . . .	[N: with auto-engagement means for automatic snap-on of the tool coupler part] [N1204]
E02F3/36C2P	. . . . .	[N: with redundant latching means, e.g. for safety purposes] [N1204]
E02F3/36C2R	. . . . .	[N: with energy coupler, e.g. coupler for hydraulic or electric lines, to provide energy to drive(s) mounted on the tool] [N1204]
E02F3/36C2T	. . . . .	[N: electrically-operated] [N1204]
E02F3/36C2V	. . . . .	[N: hydraulically-operated] [N1204]
E02F3/36C2X	. . . . .	[N: where engagement is effected by a mechanical lever or handle] [N1204]
E02F3/36C2Z	. . . . .	[N: where disengagement is effected by a mechanical lever or handle] [N1204]
E02F3/36C4	. . . . .	[N: allowing movement, e.g. rotation or translation, of the tool around or along another axis as the movement implied by the boom or arms, e.g. for tilting buckets] [N1204]
E02F3/36C4R	. . . . .	[N: Rotators] [N1204]
E02F3/36C6	. . . . .	[N: using adapters, i.e. additional element to mount between the coupler and the tool] [N1204]
E02F3/36F	. . . .	[N: Devices to connect parts of a boom or an arm (devices to connect booms or arms to tractors E02F3/627)] [N1204]
E02F3/36H	. . . .	[N: Arrangements for connecting dipper-arms to loaders or graders] [N1204]
E02F3/38	. . . .	Cantilever beams [N: i.e. booms; e.g. manufacturing processes, forms, geometry or materials used for booms (for booms with cable suspension arrangements E02F9/14 takes precedence)]; Dipper-arms [N: e.g. manufacturing processes, forms, geometry or materials used for dipper-arms]; Bucket-arms [N: (E02F3/34 takes precedence)] [N1204]
E02F3/38B	. . . . .	[N: Connections to the frame; Supports for booms or arms (devices to connect booms or arms to tractors or similar machines E02F3/627; pivot joint assemblies in particular E02F9/00C)] [N1204]
E02F3/38B2	. . . . .	[N: the boom being pivotable relative to the frame about a vertical axis]
E02F3/38B4	. . . . .	[N: the boom being laterally shiftable relative to the frame]
E02F3/38L	. . . . .	[N: Mechanical locking means for booms or arms against rotation, e.g. during transport of the machine (transporting-cranes B66C23/34D)] [N1204]

E02F3/40	. . . . .	Dippers; Buckets [N: Grab device, e.g. manufacturing processes for buckets, form, geometry, material of buckets (devices to connect tools to arms or booms E02F3/36C; teeth therefor E02F9/28)] [N1204]
E02F3/40A	. . . . .	[N: Buckets or forks comprising, for example, shock absorbers, supports or load striking scrapers to prevent overload]
E02F3/40G	. . . . .	[N: with means for facilitating the loading thereof, e.g. conveyers]
E02F3/40G2	. . . . .	[N: comprising two parts movable relative to each other, e.g. for gripping]
E02F3/40G4	. . . . .	[N: using vibrating means (blades or levelling tools with vibrating teeth E02F3/815D; vibrating rippers E02F5/32H)]
E02F3/407	. . . . .	with ejecting [N: or other unloading] device
E02F3/407B	. . . . .	[N: Dump doors; Control thereof]
E02F3/413	. . . . .	with grabbing device ([N: E02F3/40G2 takes precedence; with grab buckets moved by cables or hoisting ropes E02F3/47;] grab equipment for cranes B66C) [N1204]
E02F3/413A	. . . . .	[N: mounted on a floating substructure (floating substructures per se E02F9/06)] [N0504]
E02F3/413D	. . . . .	[N: grabs carried out as loaders or mounted on a tractor] [N0504]
E02F3/413F	. . . . .	[N: with grabs mounted directly on a boom] [N0504]
E02F3/413G	. . . . .	[N: with grabs mounted on a slidable or telescopic boom or arm] [N1204]
E02F3/413H	. . . . .	[N: the grab being emptied by flushing] [N0504]
E02F3/42	. . . . .	Drives for dippers, buckets, dipper-arms or bucket-arms
E02F3/42B	. . . . .	[N: Drive systems for bucket-arms, front-end loaders, dumpers or the like] [C9509]
E02F3/42D	. . . . .	[N: Drive systems for dipper-arms, backhoes or the like] [C9509]
E02F3/42M	. . . . .	[N: with mechanical drives (by cables or hoisting ropes E02F3/46 take precedence)] [N1204]
E02F3/43	. . . . .	Control of dipper or bucket position; Control of sequence of drive operations
E02F3/43B	. . . . .	[N: for bucket-arms, front-end loaders, dumpers or the like]
E02F3/43B2	. . . . .	{7 dots} [N: for keeping the bucket in a predetermined position or attitude]
E02F3/43B2H	. . . . .	{8 dots} [N: horizontal, e.g. self-levelling]
E02F3/43B4	. . . . .	{7 dots} [N: providing automatic sequences of movements, e.g. automatic dumping or loading, automatic return-to-dig]
E02F3/43D	. . . . .	[N: for dipper-arms, backhoes or the like]
E02F3/43D2	. . . . .	{7 dots} [N: for keeping the dipper in the horizontal position, e.g. self-levelling]
E02F3/43D4	. . . . .	{7 dots} [N: providing automatic sequences of movements, e.g. linear excavation, keeping dipper angle constant]
E02F3/43D6	. . . . .	{7 dots} [N: Memorising movements for repetition, e.g. play-back capability]
E02F3/43D8	. . . . .	{7 dots} [N: Automatic repositioning of the implement, e.g. automatic dumping, auto-return (E02F3/43D6 takes precedence)]
E02F3/46	. . . . .	with reciprocating digging or scraping elements moved by cables or hoisting ropes; [N: Drives or control devices therefor (E02F3/20F, E02F3/90B take precedence)] [N1204]

- E02F3/47 . . . with grab buckets ([grab equipment for cranes B66C](#)) [[C0409](#)]
- E02F3/47B . . . . [N: for making foundation slots (slotting machines with a pair of digging wheels E02F3/20F)] [[N1204](#)]
- E02F3/48 . . . Drag-lines
- E02F3/50 . . . with buckets or other digging elements moved along a rigid guideway
- E02F3/52 . . . Cableway excavators ([cable cranes B66C](#))
- E02F3/54 . . . Cable scrapers [N: (E02F3/48, E02F3/52 take precedence)] [[N1204](#)]
- E02F3/56 . . . . with hand-controlled scraper or other digging elements
- E02F3/58 . . . Component parts [N: (E02F9/14, E02F3/90B take precedence)] [[N1204](#)]
- E02F3/60 . . . . Buckets, scrapers, or other digging elements
- E02F3/627 . . . Devices to connect beams or arms to tractors or similar self-propelled machines, [N: e.g. drives therefor (Connection of beams or booms or arms to the frame per se E02F3/38B; connection of scraper bowls to the vehicle main body E02F3/65F; connecting devices for agriculture tractors A01B59/06)] [[N1204](#)]
- E02F3/627L . . . . [[N: using legs to support the beams or arms on the ground during the connecting process](#)]
- E02F3/627S . . . . [N: on one side of the frame] [[N1204](#)]
- E02F3/633 . . . Drives therefor [N: (not used, see [E02F3/627](#))]
- E02F3/64 . . . Buckets cars, i.e. having scraper bowls [N: (for cable scrapers E02F3/54 takes precedence; soil working machines in agriculture A01B)] [[N1204](#)]
- E02F3/64S . . . . [N: Self-propelled scrapers] [[N1204](#)]
- E02F3/64S2 . . . . [N: with rotatable scraper bowls for dumping the soil (with only elements of the scraper bowls being pivotable E02F3/64S4)] [[N1204](#)]
- E02F3/64S4 . . . . [N: with elements of the scraper bowls being pivotable for dumping the soil (E02F3/64S8 take precedence; with an ejector having translational movement E02F3/64S6)] [[N1204](#)]
- E02F3/64S6 . . . . [N: with scraper bowls with an ejector having translational movement for dumping the soil (E02F3/64S8 takes precedence)] [[N1204](#)]
- E02F3/64S8 . . . . [N: with conveying means for emptying the scraper bowl] [[N1204](#)]
- E02F3/64T . . . . [N: Towed (i.e. pulled or pushed) scrapers] [[N1204](#)]
- E02F3/64T2 . . . . [N: with rotatable scraper bowls for dumping the soil (with only elements of the scraper bowls being pivotable E02F3/64T4)] [[N1204](#)]
- E02F3/64T4 . . . . [N: with elements of the scraper bowls being pivotable for dumping the soil (E02F3/64T8 takes precedence; with an ejector having translational movement E02F3/64T6)] [[N1204](#)]
- E02F3/64T6 . . . . [N: with scraper bowls with an ejector having translational movement for dumping the soil (E02F3/64T8 takes precedence)] [[N1204](#)]
- E02F3/64T8 . . . . [N: with conveying means for emptying the scraper bowl] [[N1204](#)]
- E02F3/65 . . . Component parts, e.g. drives, control devices
- E02F3/65B . . . . [N: Hydraulic or pneumatic drives; Electric or electro-mechanical control devices (E02F3/65D, E02F3/65F take precedence)] [[N1204](#)]
- E02F3/65D . . . . [N: Means to adjust the height of the scraper bowls, e.g. suspension means, tilt control, earth damping control] [[N1204](#)]
- E02F3/65F . . . . [N: Connection mechanisms to the main body of the machine (connection of tools to dipper-arms, booms, bucket-arms E02F3/36C; connection of beams or booms or arms to tractors in general E02F3/627)] [[N1204](#)]
- E02F3/65H . . . . [N: Scraper bowls and components mounted on them] [[N1204](#)]
- E02F3/65H2 . . . . . [N: Loading or elevator mechanisms (Loading devices for excavators in

		general E02F7/04)] [N1204]
E02F3/65H4	. . . . .	[N: Ejector or dumping mechanisms (for buckets mounted on a dipper-arm or bucket arms E02F3/407)] [N1204]
E02F3/65H6	. . . . .	[N: Means to prevent the spilling of dredged material, e.g. apron, baffle] [N1204]
E02F3/65H8	. . . . .	[N: Cutting edge (for graders or bulldozer blades E02F3/815C, E02F3/815D; teeth per se E02F9/28)] [N1204]
E02F3/65H10	. . . . .	[N: Conveying means for emptying scraper bowls (conveying equipment for excavators in general E02F7/02)] [N1204]
E02F3/76	. . . . .	Graders, bulldozers, or the like with scraper plates or ploughshare-like elements (soil-working A01B); Levelling [N: scarifying] devices [N: (street cleaning E01H; construction of roads E01C19, E01C23)] [N1204]
E02F3/76A	. . . . .	[N: Combinations of scraper blades with soil loosening tools working independently of scraper blades (soil loosening attachments fixed on blades E02F3/815C, E02F3/815D)]
E02F3/76B	. . . . .	[N: Scraper blade mounted forwardly of the tractor on a pair of pivoting arms which are linked to the sides of the tractor, e.g. bulldozers] [C0404]
E02F3/76B2	. . . . .	[N: with the scraper blade adjustable relative to the pivoting arms about a vertical axis, e.g. angle dozers] [N0404]
E02F3/76B4	. . . . .	[N: with the scraper blade adjustable relative to the pivoting arms about a horizontal axis] [N0404]
E02F3/76D	. . . . .	[N: Scraper equipment with the scraper blade mounted on a frame to be hitched to the tractor by bars, arms, chains or the like, the frame having no ground supporting means of its own, e.g. drag scrapers] [C0404]
E02F3/76D2	. . . . .	[N: with the scraper blade adjustable relative to the frame about a vertical axis] [N0404]
E02F3/76D4	. . . . .	[N: with the scraper blade adjustable relative to the frame about a horizontal axis] [N0404]
E02F3/76K	. . . . .	[N: Graders with the scraper blade mounted under the tractor chassis] [N0404]
E02F3/76K2	. . . . .	[N: with the scraper blade being pivotable about a vertical axis] [N0404]
E02F3/76K4	. . . . .	[N: with the scraper blade being pivotable about a horizontal axis disposed parallel to the blade] [N0404]
E02F3/76K6	. . . . .	[N: with the scraper blade being pivotable about a horizontal axis disposed perpendicular to the blade] [N0404]
E02F3/76K8	. . . . .	[N: with the scraper blade being horizontally movable into a position near the chassis] [N0404]
E02F3/76K10	. . . . .	[N: with the vertical centre-line of the scraper blade disposed laterally relative to the central axis of the chassis] [N0404]
E02F3/76L	. . . . .	[N: Graders with the scraper blade mounted under a frame supported by wheels, or the like] [N0404]
E02F3/76L2	. . . . .	[N: with the scraper blade being pivotable about a vertical axis][N0404]
E02F3/76L4	. . . . .	[N: with the scraper blade being pivotable about a horizontal axis disposed parallel to the blade][N0404]
E02F3/76L6	. . . . .	[N: with the scraper blade being pivotable about a horizontal axis disposed perpendicular to the blade] [N0404]
E02F3/76L8	. . . . .	[N: with the scraper blade being horizontally movable into a position near the frame] [N0404]
E02F3/76L10	. . . . .	[N: with the vertical centre-line of the scraper blade disposed laterally relative to the central axis of the frame] [N0404]

E02F3/76N	. . .	[N: Graders, bulldozers, or the like comprising loaders] [N0404]
E02F3/76R	. . .	[N: Graders, bulldozers or the like comprising elevators or conveyers] [N1204]
E02F3/78	. . .	with rotating digging elements
E02F3/78B	. . . .	[N: having a horizontal axis of rotation] [N1204]
E02F3/78D	. . . .	[N: having a vertical axis of rotation] [N1204]
E02F3/80	. . .	Component parts
E02F3/815	. . . .	Blades; Levelling[N: or scarifying]tools[N: ( <a href="#">E02F3/40</a> takes precedence)][C9809]
E02F3/815C	. . . . .	[N: Attachments therefor, e.g. wear resisting parts, cutting edges ( <a href="#">E02F3/815D</a> , <a href="#">E02F3/815F</a> take precedence; teeth per se <a href="#">E02F9/28</a> )] [N1204]
E02F3/815D	. . . . .	[N: provided with movable parts, e.g. cutting discs, vibrating teeth or the like]
E02F3/815F	. . . . .	[N: Shock absorbers; Supports, e.g. skids, rollers; Devices for compensating wear-and-tear, or the like]
E02F3/84	. . . .	Drives or control devices therefor, [N: e.g. hydraulic drive systems] [N1204]
E02F3/84A	. . . . .	[N: Devices for controlling and guiding the whole machine, e.g. by feeler elements and reference lines placed exteriorly of the machine (construction of roads <a href="#">E01C19/00C3</a> )] [N1204]
E02F3/84A2	. . . . .	[N: using electromagnetic, optical or photoelectric beams, e.g. laser beams]
E02F3/84B	. . . . .	[N: for positioning the blade, e.g. hydraulically]
E02F3/84B2	. . . . .	[N: using mechanical sensors to determine the blade position, e.g. inclinometers, gyroscopes, pendulums]
E02F3/84B4	. . . . .	[N: using electromagnetic, optical or acoustic beams to determine the blade position, e.g. laser beams]
E02F3/84B8	. . . . .	[N: using cable drums]
E02F3/88	. .	with arrangements acting by a sucking or forcing effect, e.g. suction dredgers ( <a href="#">pumps in general F04</a> )
E02F3/88B	. . .	[N: Stationary installations, e.g. installations using spuds or other stationary supports (spuds on floating substructures per se <a href="#">E02F9/06B</a> ; cleaning the beds of waterways <a href="#">E02B3/02</a> )] [N1204]
E02F3/88C	. . .	[N: Mobile land installations] [N0407]
E02F3/88C2	. . . .	[N: wherein at least a part of the soil-shifting equipment is mounted on a dipper-arm, backhoes or the like] [N0407]
E02F3/88E	. . .	[N: Floating installations (floating substructures per se <a href="#">E02F9/06</a> )] [N1204]
E02F3/88E2	. . . .	[N: wherein at least a part of the soil-shifting equipment is mounted on a ladder or boom] [N0407]
E02F3/88E4	. . . .	[N: self propelled, e.g. ship] [N0504]
E02F3/88F	. . .	[N: Submerged units ( <a href="#">self propelled units for burying conduits or cables in trenches under water E02F5/10P2</a> )]
E02F3/88F4	. . . .	[N: self propelled] [N0504]
E02F3/88F6	. . . .	[N: pulled or pushed] [N0504]
E02F3/88H	. . .	[N: Using the force of explosions, e.g. by the use of internal combustion engines]
E02F3/88K	. . .	[N: wherein at least a part of the soil-shifting equipment is handheld] [N0407]
E02F3/90	. . .	Component parts [N: e.g. arrangement or adaptation of pumps]

E02F3/90A	. . . .	[N: for modifying the concentration of the dredged material, e.g. relief valves preventing the clogging of the suction pipe] [N1204]
E02F3/90B	. . . .	[N: Manipulating or supporting suction pipes or ladders; Mechanical supports or floaters therefor; pipe joints for suction pipes (for heave compensation E02F9/06H takes precedence; pipelines per se E02F7/10; joints for pipes in general F16L)] [N1204]
E02F3/90D	. . . .	[N: Measuring or control devices, e.g. control units, detection means or sensors (E02F3/90A takes precedence)] [N1204]
E02F3/92	. . . .	Digging elements, e.g. suction heads
E02F3/92J	. . . .	[N: Digging devices using blowing effect only, like jets or propellers (E02F5/10P6 takes precedence; passive suction heads with jets E02F3/92P2; active suction heads with jets E02F3/92T2; drilling by jets E21B7/18; slitting by jets E21C25/60)] [N1204]
E02F3/92M	. . . .	[N: Mechanical digging means, e.g. suction wheels, i.e. wheel with a suction inlet attached behind the wheel (E02F3/92V takes precedence; Active suction heads E02F3/92T)] [N1204]
E02F3/92M2	. . . .	[N: with jets] [N1204]
E02F3/92M4	. . . .	[N: with rotating cutting elements] [N1204]
E02F3/92M4L	. . . .	{7 dots} [N: Suction wheels with axis of rotation parallel to longitudinal axis of the suction pipe] [N1204]
E02F3/92M4T	. . . .	{7 dots} [N: Suction wheels with axis of rotation in transverse direction of the longitudinal axis of the suction pipe] [N1204]
E02F3/92P	. . . .	[N: Passive suction heads with no mechanical cutting means (E02F5/10P10 takes precedence)] [N1204]
E02F3/92P2	. . . .	[N: with jets] [N0504]
E02F3/92T	. . . .	[N: Active suction heads; Suction heads with cutting elements, i.e. the cutting elements are mounted within the housing of the suction head (E02F5/10P10 takes precedence)] [N1204]
E02F3/92T2	. . . .	[N: with jets] [N0504]
E02F3/92T4	. . . .	[N: with rotating cutting elements] [N0504]
E02F3/92T4L	. . . .	{7 dots} [N: with axis of rotation parallel to longitudinal axis of the suction pipe] [N0504]
E02F3/92T4T	. . . .	{7 dots} [N: with axis of rotation in horizontal and transverse direction of the suction pipe] [N0504]
E02F3/92V	. . . .	[N: Vibrating suction heads] [N0504]
E02F3/92W	. . . .	[N: Component parts of suction heads, e.g. edges, strainers for preventing the entry of stones or the like] [N0504]
E02F3/94	. . . .	Apparatus for separating stones from the dredged material, [N: i.e. separating or treating dredged material (screening plants mounted on dredger therefor E02F7/06)] [C0504]
E02F3/94E	. . . .	[N: for environmental purposes] [N0504]
E02F3/96	. . . .	with arrangements for alternate [N: or simultaneous] use of different digging elements [N: (E02F3/76A, E02F3/76N, E02F3/78 take precedence; quick-acting devices to connect tools to arms or booms E02F3/36C2, for arms to tractors or the like E02F3/627)] [N1204]
E02F3/96B	. . . .	[N: with several digging elements or tools mounted on one machine (for backhoes E02F3/96D2 takes precedence)] [N1204]
E02F3/96C	. . . .	[N: Mounting of implements directly on tools already attached to the machine (E02F3/40G2 and E02F3/815C take precedence)]
E02F3/96D	. . . .	[N: Arrangements on backhoes for alternate use of different tools (backhoes per

- se E02F3/30; quick-acting devices to connect tools to arms E02F3/36C2, for arms to tractors or the like E02F3/627)] [N1204]
- E02F3/96D2 . . . . [N: of several tools mounted on one machine (E02F3/96C takes precedence)] [N1204]
- E02F3/96F . . . . [N: of metal-cutting or concrete-crushing implements (shearing devices B23D17/00; wrecking of buildings, e.g. tools therefor, E04F23/08)] [N1204]
- E02F3/96H . . . . [N: of hammer-type tools (arrangements for breaking-up hard ground E02F5/30A; percussion -type rippers E02F5/32B)] [N1204]
- E02F3/96J . . . . [N: of compacting-type tools (compacting tools in combination with special-purpose dredges or soil-shifting machines E02F5/30)] [N1204]
- E02F3/96T . . . . [N: Storing, handling or otherwise manipulating tools when detached from the machine (E02F3/627L takes precedence)]
- E02F5/00 Dredgers or soil-shifting machines for special purposes**
- E02F5/00A . [N: for uncovering conduits]
- E02F5/00F . [N: adapted for working ground under water not otherwise provided for (E02F3/08A, E02F3/413A, E02F3/88E, E02F5/10P, E02F5/12W, E02F7/00B, E02F7/02B, E02F7/06B, E02F9/02F, E02F9/04F, E02F9/06 take precedence)] [N1204]
- E02F5/02 . for digging trenches or ditches ([N: machines for making foundation slots E02F3/20F, E02F3/47B take precedence]; agricultural ploughs for working ridges A01B13/02) [N1204]
- E02F5/02D . . [N: with tools digging laterally with respect to the frame]
- E02F5/02G . . [N: with scraper-buckets, dippers or shovels]
- E02F5/02H . . [N: with coulters, ploughs, scraper plates, or the like (E02F5/10B, E02F5/10B2, E02F5/10P4 take precedence)] [N1204]
- E02F5/04 . . with digging screws [N: (E02F5/10P12 takes precedence; with digging screws per se E02F3/06)] [N1204]
- E02F5/06 . . with digging elements mounted on an endless chain [N: (E02F5/10P12 takes precedence; with digging elements mounted on an endless chain per se E02F3/08)] [N1204]
- E02F5/08 . . with digging wheels turning round an axis [N: (E02F5/10P12 takes precedence; with digging wheels per se E02F3/18)] [N1204]
- E02F5/10 . . with arrangements for reinforcing trenches or ditches; with arrangements for making or assembling conduits or for laying conduits or cables (laying pipes per se F16L1/00, making pipes in situ F16L1/038; laying electric cables per se H02G1/06; [N: drainage device- laying apparatus E02B11/02]) [N1204]
- E02F5/10A . . . [N: forming during digging, e.g. underground canalisations or conduits, by bending or twisting a strip of pliable material; by extrusion]
- E02F5/10B . . . [N: operatively associated with mole-ploughs, coulters (rippers E02F5/32)]
- E02F5/10B2 . . . . [N: with oscillating or vibrating digging tools]
- E02F5/10P . . . . [N: for burying conduits or cables in trenches under water (floating substructures per se E02F9/06)]
- E02F5/10P2 . . . . [N: self-propulsed units moving on the underwater bottom]
- E02F5/10P4 . . . . [N: using ploughs, coulters, rippers] [N1204]
- E02F5/10P6 . . . . [N: using blowing-effect devices, e.g. jets (digging devices using a blowing effect per se E02F3/92J)] [N1204]

- E02F5/10P10 . . . . [N: using suction-effect devices (suction heads per se E02F3/92P, E02F3/92T)] [N1204]
- E02F5/10P12 . . . . [N: using rotating digging elements (rotating digging elements per se E02F3/18)] [N1204]
- E02F5/12 . . with equipment for back-filling trenches or ditches
- E02F5/12W . . . [N: underwater] [N9506]
- E02F5/14 . . Component parts for trench excavators, e.g. indicating devices [N: travelling gear chassis, supports, skids]
- E02F5/14B . . . [N: control and indicating devices]
- E02F5/16 . Machines for digging other holes in the soil (earth drilling E21)
- E02F5/18 . . for horizontal holes [N: or inclined holes] [N1204]
- E02F5/20 . . for vertical holes
- E02F5/22 . for making embankments; for back-filling (in combination with trench excavators [E02F5/12](#))
- E02F5/22B . . [N: for back-filling (in association with trench excavators [E02F5/12](#))]
- E02F5/22B2 . . . [N: with means for processing the soil, e.g. screening belts, separators; Padding machines] [N9412]
- E02F5/24 . . Depositing dredged material in mounds
- E02F5/26 . . Combined conveying-bridges and dredgers
- E02F5/28 . for cleaning watercourses or other ways [N: (stream regulation E02B3/02)] [N1204]
- E02F5/28B . . [N: with rotating cutting or digging tools]
- E02F5/28D . . [N: with drag buckets or scraper plates]
- E02F5/28F . . [N: with jet nozzles (digging devices with blowing effect per se E02F3/92J)] [N1204]
- E02F5/30 . Auxiliary apparatus, e.g. for tawing, craking, blowing-up, or other preparatory treatment of the soil
- E02F5/30A . . [N: Arrangements for breaking-up hard ground (E02F5/32 takes precedence; hammer-type tools E02F3/96H; breaking-up paving of roads or the like E01C23/12; breaking-up subaqueous rock E02B3/02)] [N1204]
- E02F5/32 . . Rippers [N: (E02F5/10P4 takes precedence, ripper or scarifying teeth mounted on blades E02F3/815C; ripper tips E02F9/28D)] [N1204]
- E02F5/32B . . . [N: Percussion-type rippers]
- E02F5/32H . . . [N: oscillating or vibrating]
- E02F7/00** **Equipment for conveying or separating excavated material (barges adapted for carrying-away material from floating dredgers [B63B35/28](#))**
- E02F7/00B . [N: conveying material from the underwater bottom (by pipelines [E02F7/10](#); suction dredgers [E02F3/88](#))]
- E02F7/02 . Conveying equipment mounted on dredgers or excavators (conveyers in general B65G) [N: (in combination with graders or bulldozers E02F3/76R; in combination with rotating digging wheels E02F3/18B; in combination with bucket-arms E02F3/348; in combination with digging elements mounted on an endless chain E02F3/08C, E02F3/08E)] [N1204]
- E02F7/02B . . [N: mounted on a floating dredger]

- E02F7/02D . . [N: mounted on machines equipped with dipper- or bucket-arms]
- E02F7/04 . Loading devices mounted on a dredger or an excavator (loading devices in general [B65G](#)) [N: hopper dredgers, also equipment for unloading the hopper]
- E02F7/06 . Delivery chutes or screening plants [N: or mixing plants] mounted on dredgers or excavators ([N: for back-filling E02F5/22B2 takes precedence]; separating equipment in general B03; delivery chutes in general [B65G](#)) [N1204]
- E02F7/06B . . [N: mounted on a floating dredger]
- E02F7/10 . Pipelines for conveying excavated materials (pipes in general [F16L](#); pipe-lines systems [F17D](#)) [N: conveying by liquid pressure [B65G53/30](#)]
  
- E02F9/00** **Component parts of dredgers or soil-shifting machines, not restricted to one of the kinds covered by groups [E02F3/00](#) to [E02F7/00](#) (laying-out or take-up devices for trailing electric cables [B66C](#))**
  
- E02F9/00B . [N: Devices for transporting the soil-shifting machines or excavators, e.g. by pushing them or by hitching them to a tractor]
- E02F9/00C . [N: Pivot joint assemblies (in general [F16C11/04](#))]
- E02F9/02 . Travelling-gear, e.g. associated with slewing gears ([N: drives therefor [E02F9/20](#)]; for motor vehicles [B60B](#), G; undercarriages for locomotives or rail-road cars [B61F](#); track-laying vehicles [B62D](#); for cranes [B66C23/18](#))
- E02F9/02B . . [N: for moving on rails]
- E02F9/02D . . [N: with laterally or vertically adjustable wheels or tracks (for vehicles in general [B60B35/10](#); [B62D55/084](#))]
- E02F9/02F . . [N: for moving on the underwater bottom (marine propulsion by direct engagement with water-bed or ground [B63H19/08](#))]
- E02F9/02L . . [N: with arrangements for levelling the machine (hydraulic drives therefor [E02F9/22V](#))]
- E02F9/04 . . Walking gears moving the dredger forward step-by-step
- E02F9/04F . . . [for moving on the underwater bottom (for artificial islands [E02B17/02B2](#); marine propulsion by direct engagement with water-bed or ground [B63H19/08](#))]
  
- E02F9/06 . Floating substructures as supports [N: (floating installations with arrangements acting by a sucking or forcing effect E02F3/88E)] [N1204]
- E02F9/06B . . [N: Advancing equipment, e.g. spuds for floating dredgers]
- E02F9/06B2 . . . [N: characterised by the use of lines with anchors and winches] [N9602]
- E02F9/06H . . [N: with arrangements for heave compensation (for drilling structures [E21B19/09](#); for lifting devices [B66C13/02](#))]
  
- E02F9/08 . Superstructures; Supports for superstructures [N: (arrangements for travelling gear, e.g. undercarriages for wheels, crawlers, caterpillars E02F9/02; for motor vehicles B62D25/00, B62D33/00)] [N1204]
- E02F9/08A . . [N: Improving mounting or assembling, e.g. frame elements, disposition of all the components on the superstructures (for disposition of specific components, E02F9/08N)] [N1204]
- E02F9/08A2 . . . [N: Welded frame structure] [N1204]
- E02F9/08A4 . . . [N: Cast frame structure] [N1204]

- E02F9/08B . . [N: Improving access, e.g. for maintenance, steps for improving driver's access, handrails] [N1204]
- E02F9/08D . . [N: Articulated frame, i.e. having at least one pivot point between two travelling gear units (tractor-trailer combinations [B62D53/00](#))]
- E02F9/08L . . [N: Ground-engaging fitting for supporting the machines while working, e.g. outriggers, legs (for vehicles in general B60S9/00, for cranes B66C23/78)] [N1204]
- E02F9/08N . . [N: Arrangement of component parts installed on superstructures not otherwise provided for, e.g. electric components, fenders, air-conditioning units (E02F9/16, E02F9/18 take precedence)] [N1204]
- E02F9/08N2 . . . [N: Engine compartment, e.g. heat exchangers, exhaust filters, cooling devices, silencers, mufflers, position of hydraulic pumps in the engine compartment] [N1204]
- E02F9/08N4 . . . [N: Arrangement of valve arrangements on superstructures (arrangement of hydraulic hoses E02F9/22Y6 takes precedence; valves per se E02F9/22Y2)] [N1204]
- E02F9/08N6 . . . [N: Tanks, e.g. oil tank, urea tank, fuel tank (for vehicles in general B60K15)] [N1204]
- E02F9/08N8 . . . [N: Lids or bonnets or doors or details thereof (doors for cabins E02F9/16B takes precedence; for motor vehicles B62D25/10)] [N1204]
- E02F9/10 . . Supports for movable superstructures mounted on travelling or walking gears or on other superstructures
- E02F9/12 . . . Slewing or traversing gears ([roller and ball bearings F16C](#))
- E02F9/12B . . . . [N: Turntables, i.e. structure rotatable about 360#] [N1204]
- E02F9/12B2 . . . . . [N: Drives or control devices specially adapted therefor (E02F9/12B8 and E02F9/12B12 take precedence)] [N1204]
- E02F9/12B8 . . . . . [N: Locking devices] [N1204]
- E02F9/12B10 . . . . . [N: Lubrication systems] [N1204]
- E02F9/12B12 . . . . . [N: Braking systems] [N1204]
  
- E02F9/14 . Booms [N: only for booms with cable suspension arrangements (for booms or manipulators with cable suspensions for suction pipes E02F3/90B takes precedence; for booms per se E02F3/38; E02F3/34 for bucket-arms)]; Cable suspensions [N1204]
  
- E02F9/16 . Cabins, platforms, or the like, for drivers ([N: for motor vehicles in general B62D33/06, for cranes B66C13/54] [N1204]
  
- E02F9/16B . . [N: Structures to protect drivers, e.g. cabins, doors for cabins; Falling object protection structure (FOPS); Roll over protection structure (ROPS) (for handrails mounted on cabins E02F9/08B takes precedence; for vehicles in general B60R21/11, B60R21/13, for fork-lift trucks B66F9/075D)] [N1204]
  
- E02F9/16M . . [N: movable, tiltable or pivoting, e.g. movable seats, dampening arrangements of cabins (seats for vehicles in general B60N2)] [N1204]
  
- E02F9/18 . Counterweights [N: (for cranes B66C23/72, for tractors B62D49/08B)] [N1204]
  
- E02F9/20 . Drives; Control devices ([gearings in general F16H](#); [controlling in general G05](#); [electric multi-motor drives H02K, H02P](#)) [C9611]
  
- E02F9/20A . . [N: Control mechanisms, e.g. control levers ([control levers per se G05G](#))]
- E02F9/20A2 . . . [N: Control mechanisms in the form of the machine in the reduced scale model] [N1204]
- E02F9/20A4 . . . [N: Setting the functions of the control levers, e.g. changing assigned functions among operations levers, setting functions dependent on the operator or seat

		orientation] [N1204]
E02F9/20D	. .	[N: Winches (winches per se B66D)] [N1204]
E02F9/20F	. .	[N: Mechanical transmission, e.g. clutches, gears (clutches per se F16D, gears per se F16H)] [N1204]
E02F9/20G	. .	[N: Particular purposes of control systems not otherwise provided for (E02F3/16, E02F3/26, sub-groups of E02F3/43, E02F3/65B, sub-groups of E02F3/84, E02F3/90D, E02F5/14B take precedence)] [N1204]
E02F9/20G2	. . .	[N: Controlling the position of implements in function of its load, e.g. modifying the attitude of implements in accordance to vehicle speed (control for hydraulic or pneumatic drives E02F9/22C, E02F9/22F and E02F9/22T take precedence)] [N1204]
E02F9/20G4	. . .	[N: Limiting the movement of frames or implements, e.g. to avoid collision between implements and the cabin (sub-groups of E02F3/43B of E02F3/43D take precedence; for turntables E02F9/12B2)] [N1204]
E02F9/20G6	. . .	[N: Coordinating the movements of the implement and of the frame]
E02F9/20G8	. . .	[N: Automatic repositioning of implements, i.e. memorising determined positions of the implement (for dipper-arms or bucket-arms E02F3/43B4, E02F3/43D4, E02F3/43D6, E02F3/43D8 take precedence)] [N1204]
E02F9/20G10	. . .	[N: Guiding machines along a predetermined path (for graders E02F3/84A; machines for construction of roads E01C19/00C)] [N1204]
E02F9/20G12	. . .	[N: Remotely operated machines, e.g. unmanned vehicles (E02F3/88F4 takes precedence)] [N1204]
E02F9/20G14	. . .	[N: Fleet management] [N1204]
E02F9/20N	. .	[N: Electric or electro-mechanical or mechanical control devices of vehicle sub-units (for vehicles in general B60W)] [N1204]
E02F9/20N2	. . .	[N: Control of propulsion units (for control of the prime mover depending on the load in a hydraulic or pneumatic drive E02F9/22M)] [N1204]
E02F9/20N2B	. . . .	[N: of the type combustion engines] [N1204]
E02F9/20N2D	. . . .	[N: of the type electric propulsion units, e.g. electric motors or generators] [N1204]
E02F9/20N2F	. . . .	[N: of the hybrid type (for vehicles in general B60W20)] [N1204]
E02F9/20N4	. . .	[N: Control of mechanical transmission (for hydrostatic transmission or hydraulic torque converter E02F9/22T)] [N1204]
E02F9/20N6	. . .	[N: Control of vehicle braking systems] [N1204]
E02F9/20N8	. . .	[N: Control of vehicle steering (for steering with hydraulic or pneumatic drives E02F9/22S)] [N1204]
E02F9/20N10	. . .	[N: Control of energy storage means for electrical energy, e.g. battery or capacitors (energy recovery arrangements in hydraulic or pneumatic drives E02F9/22E)] [N1204]
E02F9/20N12	. . .	[N: Control of electric, electro-mechanical or mechanical equipment not otherwise provided for, e.g. ventilators, electro-driven fans (control of hydraulic driven equipment E02F9/22)] [N1204]
E02F9/22	. .	Hydraulic or pneumatic drives [N: (for dipper or bucket arm position control E02F3/43, for blade position control for graders E02F3/84B; for turntables E02F9/12B; for fork-lift trucks B66F9/22)] [N1204]
E02F9/22C	. . .	[N: Arrangements for controlling the attitude of actuators, e.g. speed, floating function] [N1204]
E02F9/22C2	. . . .	[N: for reducing or compensating oscillations]
E02F9/22C4	. . . .	[N: for generating actuator vibration (buckets with vibrating means E02F3/40G4)]

- E02F9/22C6 . . . . [N: for reducing the shock generated at the stroke end] [N9701]
- E02F9/22E . . . . [N: with energy recovery arrangements, e.g. using accumulators, flywheels]
- E02F9/22F . . . . [N: Control of flow rate; Load sensing arrangements (E02F9/22C take precedence over E02F9/22F)] [N1204]
- E02F9/22F2 . . . . [N: using pressure-compensating valves] [C9611]
- E02F9/22F2C . . . . . [N: including an electronic controller] [N9611]
- E02F9/22F4 . . . . . [N: using one or more variable displacement pumps] [N9611]
- E02F9/22F4C . . . . . [N: including an electronic controller] [N9611]
- E02F9/22F6 . . . . . [N: using two or more pumps with cross-assistance] [N9611]
- E02F9/22F6C . . . . . [N: including an electronic controller] [N9611]
- E02F9/22M . . . . [N: Control of prime movers, e.g. depending on the hydraulic load of work tools] [N1204]
- E02F9/22S . . . . [N: Control of steering, e.g. for hydraulic motors driving the vehicle tracks (steering in general [B62D](#))]
- E02F9/22T . . . . [N: Controlling the travelling speed of vehicles, e.g. adjusting travelling speed according to implement loads, control of hydrostatic transmission] [N1204]
- E02F9/22V . . . . [N: Vehicle levelling or suspension systems (suspensions for vehicles in general [B60G](#))]
- E02F9/22W . . . . [N: Safety arrangements, e.g. hydraulic driven fans, preventing cavitation, leakage, overheating] [N1204]
- E02F9/22Y . . . . [N: Arrangements or adaptations of elements for hydraulic drives] [N1204]
- E02F9/22Y2 . . . . . [N: Valves or distributors (position of valves arrangements on upper-structures E02F9/08N4)] [N1204]
- E02F9/22Y4 . . . . . [N: Actuators and supports therefor and protection therefor] [N1204]
- E02F9/22Y6 . . . . . [N: Hoses and supports therefor and protection therefor] [N1204]
- E02F9/22Z . . . . [N: Hydraulic circuits (not used)] [N1204]
- E02F9/22Z2 . . . . . [N: Systems using center bypass type changeover valves] [N1204]
- E02F9/22Z4 . . . . . [N: Pilot-operated systems] [N1204]
- E02F9/22Z6 . . . . . [N: Closed circuit] [N1204]
- E02F9/22Z8 . . . . . [N: Systems with two or more pumps] [N1204]
- E02F9/22Z10 . . . . . [N: Systems with a variable displacement pump] [N1204]
  
- E02F9/24 . . . . Safety devices [N: e.g. for preventing overload ([E02F9/22W](#) takes precedence)]
- E02F9/24P . . . . [N: for preventing damage to underground objects during excavation, e.g. indicating buried pipes or the like (detection of pipes in the ground [F16L1/11](#))]
  
- E02F9/26 . . . . Indicating devices [N: (E02F5/14B takes precedence)] [N1204]
- E02F9/26B . . . . [N: Surveying the work-site to be treated] [N1204]
- E02F9/26B2 . . . . . [N: with follow-up actions to control the work tool, e.g. controller] [N1204]
- E02F9/26D . . . . [N: Sensors and their calibration for indicating the position of the work tool] [N1204]
- E02F9/26D2 . . . . . [N: with follow-up actions (e.g. control signals sent to actuate the work tool)] [N1204]
- E02F9/26F . . . . [N: Diagnosing or detecting failure of vehicles] [N1204]
- E02F9/26F2 . . . . . [N: with failure correction follow-up actions] [N1204]
  
- E02F9/28 . . . . Small metalwork for digging elements, e.g. teeth [N: scraper bits (ploughs for agriculture A01B15/00; teeth of harrows A01B23/02)] [N1204]

- E02F9/28A . . [N: Teeth]
- E02F9/28A2 . . . [N: Mountings therefor]
- E02F9/28A2B . . . . [N: using adapters]
- E02F9/28A2C . . . . [N: Retaining means, e.g. pins]
- E02F9/28A2C2 . . . . . [N: resilient]
- E02F9/28A4 . . . [N: characterised by the material used]
- E02F9/28A6 . . . [N: characterised by shape]
- E02F9/28B . . [N: for rotating digging elements (for milling machines B28D1/18E; for mining machines E21C35/18)] [N1204]
- E02F9/28D . . [N: Ripper tips]
- E02F9/28F . . [N: Wear elements for buckets or implements in general] [N1204]
- E02F9/28L . . [N: Tools for assembling or disassembling]