DO IT
THE SAFE WAY
—OR DON'T DO IT

ASSISTANT TRAINMASTER

R. B. RUFFATO ..... San Diego

CHIEF TRAIN DISPATCHER

R. M. GREGORY ..... Los Angeles

SPEED TABLE

TIME PER KILOMETER	TIME PER MILE	MILES PER HOUR
1′03″	1′42″	35
1′05″	1′45″	34
1′08″	1′49″	33
1′10″	1′52″	32
1′12″	1′56″	31
1′15″	2′00″	30
1′17″	2′04″	29
1′20″	2′08″	28
1′23″	2′13″	27
1′26″	2′18″	26
1′29″	2′24″	25
1′33″	2′30″	24
1′37″	2′36″	23
1′41″	2′43″	22
1′46″	2′51″	21
1′52″	3′00″	20
1′57″	3′09″	19
2′04″	3′20″	18
2′11″	3′31″	17
2′20″	3′45″	16
2′29″	4′00″	15
3′06″	5′00″	12
3′44″	6′00″	10
4′40″	7′30″	8
6′13″	10′00″	6

SAN DIEGO & ARIZONA EASTERN RAILWAY COMPANY

TIMETABLE

92

EFFECTIVE SUNDAY, OCTOBER 31, 1976
AT 12:01 A.M.
PACIFIC STANDARD TIME

FOR THE GOVERNMENT AND INFORMATION OF EMPLOYES ONLY

R. G. THRUSTON

Vice President and General Manager

W. T. HARRAL

Superintendent

EASTWARD Second Class 452 Freight Leave Daily	Mile Post or Kilometer Post	STATIONS Siding Capacities and Facilities	Station Number	Distance from El Centro	WESTWARD Second Class 451 Freight Arrive Daily
AM 7.30	1.1	R **SAN DIEGO** BKYPQ	48540	147.0	PM 5.20
	4.8	3.7 **NATIONAL CITY 12th St. Jct.**	48370	143.3	
	7.4	2.6 **CHULA VISTA JCT.**	48350	140.7	
7.52	9.1	1.7 **CHULA VISTA**	48340	139.0	4.56
7.56	11.1	2.0 **PALM CITY**	48320	137.0	4.51
8.05	15.5	TO-R 4.4 **SAN YSIDRO** KPQ	48310	132.6	4.40
8.20	K 1.0	R 0.7 **TIJUANA** P	48270	131.9	4.30
8.25	K 4.7	2.3 **AGUA CALIENTE**	48260	129.6	4.25
9.05	K 33.9	18.1 **REDONDO**	48220	111.5	3.45
9.45	K 59.9	Yd. Lmts. R 16.2 **TECATE** P	48210	95.3	3.05
10.04	60.3	7.5 **DIVISION** P	48190	87.8	2.43
10.20	65.8	Yd. Lmts. TO 5.5 **CAMPO** P	48180	82.3	2.30
11.04	84.5	1967 18.7 **HIPASS** P	48150	63.6	1.46
11.27	92.9	8.4 **JACUMBA** P	48140	55.2	1.23
11.29	94.0	1631 1.1 **TITUS** P	48130	54.1	1.21
	96.0	2.0 **DUBBERS**	48125	52.1	
PM 12.01	102.3	6.3 **TUNNEL 15 SPUR** P	48115	45.8	12.47
12.25	109.7	2563 7.4 **DOS CABEZAS** P	48110	38.4	12.25 PM
12.56	122.5	2863 12.8 **COYOTE WELLS** P	48105	25.6	11.53 AM
1.11	130.0	Yd. Lmts. TO 7.5 **PLASTER CITY** P	48080	18.1	11.37
1.31	139.8	Yd. Lmts. 9.8 **SEELEY** P	48060	8.3	11.17
1.50 PM	148.1	Yd. Lmts. TO-R 8.3 **EL CENTRO** BKYPQ	48000	0.0	11.01 AM
Arrive Daily		(147.0)			Leave Daily
452					451

Yard Limits — S.D.&A.E. Ry.

Yard Limits — S.B.C. Ry.

Yard Limits — S.D.&A.E. Ry.

RULE S-72. Exception: No. 452 is superior to No. 451.

EASTWARD Mile Post Location	CORONADO BRANCH STATIONS Siding Capacities and Facilities	Station Number	WESTWARD Distance from MP 12.00
4.8	**NATIONAL CITY, 12th St. Jct.**	48370	7.2
5.7	0.9 **NATIONAL CITY, 24th Street**	48410	6.3
7.4	1.7 **F STREET JCT.**	48420	4.6
9.9	2.5 **SALT WORKS**	48440	2.1
12.00	2.1 **END OF BRANCH**	.....	0.00
	(7.2)		

Yard Limits

EASTWARD Mile Post Location	LA MESA BRANCH STATIONS Siding Capacities and Facilities	Station Number	WESTWARD Distance from El Cajon
1.1	R **SAN DIEGO** BKYPQ	48540	15.7
10.3	9.2 **LEMON GROVE**	48620	6.5
12.3	2.0 **LA MESA**	48630	4.5
16.8	4.5 **EL CAJON**	48650	0.0
	(15.7)		

Yard Limits

ADDITIONAL STATIONS

Capacity and Direction of Entry into Spurs	Mile Post	Name	Station No.
..... W	5.8	National City.....(Spur)	48360
2690 W	10.1	Otay.....(Spur)	48330
..... W	13.2	Baird-Roll.....(Spurs)	48315
160 E	K 5.9	Standard.....(Spur)	48250
1144	K 13.6	Garcia.....(Spur)	48240
		Coronado Branch	
..... E	8.2	Rohr.....(Spur)	48430
		La Mesa Branch	
..... E-W	7.2	Encanto.....(Spurs)	48610

RULE A. Employes must know they have in their possession copy of Rules and Regulations of the Transportation Department effective October 31, 1976.

DEFINITIONS

Holidays:

New Year's Day, January 1,
Washington's Birthday, third Monday in February,
Memorial Day, last Monday in May,
Independence Day, July 4,
Labor Day, first Monday in September,
Veteran's Day, November 11,
Thanksgiving Day, fourth Thursday in November,
Christmas Day, December 25.

Note. ADD:

Flammable Compressed Gas (FCG): also applies to Flammable Gas (FG).

RULE 30. Engine bell must be rung continuously between the following points:

San Diego and east end of Tunnel 2; Tecate and Campo; MP 96 and MP 106; and on branches.

RULE S-72. Westward regular trains are superior to trains of the same class in the opposite direction, except as noted on page 2.

RULE 82-A. Regular trains will operate on the SBC RY by timetable authority and no train orders will be issued effecting the movement of such trains on the SBC RY.

San Diego: Crew operating as train No. 452, will assume schedule and leave without obtaining a clearance.

RULE 83-B. All trains may register by ticket at San Ysidro, Tijuana and Tecate.

RULE 93. Yard limits in which the provisions of Rule 93 will apply are established at the following stations:

West MP		East MP
	San Diego	K-15 (24.9)
	" (Coronado Branch)	End of Branch
	" (La Mesa Branch)	End of Branch
K58.9	Tecate	K62.2
64.58	Campo	66.94
128.50	Plaster City	131.90
138.50	Seeley	141.90
147.20	El Centro	End of SDAE Track

RULE 97. Will not apply on SBC Ry.

RULE 98. Railroad crossings not interlocking: At following grade crossings trains will stop not less than 50 feet nor farther than 500 feet from crossing and will proceed only on signal from flagman:

Crossing at Chula Vista. Exception—San Diego–El Centro main line trains will expect to find the main track blocked and will pass over the crossing not to exceed 20 MPH.

Cars must not be kicked or shoved over railroad crossings not protected by interlocking, unless movement is properly protected.

RULE 99-C. Will apply between Campo and El Centro.

RULE 103. Except as otherwise provided in this rule or by other Special Instructions or timetable bulletins, a public grade crossing which is blocked by a stopped train, other than a passenger train, must be opened within ten minutes, unless no vehicle or pedestrian is waiting at the crossing. Such a cleared crossing must be left open until it is known that trains are ready to depart. When recoupling at public crossings trains shall be moved promptly consistent with safety.

Switching movements over public grade crossings should be avoided whenever reasonably possible. If not reasonably possible, such crossings must be cleared frequently to allow a vehicle or pedestrian to pass and must not be occupied continuously for longer than ten minutes unless no vehicle or pedestrian is waiting at the crossing.

Cars or locomotives must not be left standing, nor switches left open, within the controlling circuits of automatic gate protection devices unless time-out features are provided to allow the gate arms to rise.

In the event of any uncontrolled blockage involving more than one grade crossing and a peace officer is on the scene, primary consideration shall be given to the clearing of that crossing which, in the peace officer's judgment, will result in minimum delay to vehicular traffic.

Train or yard crew member of a train blocking a public crossing shall immediately take all reasonable steps, consistent with the safe operation of such train, to clear the crossing upon receiving information from a peace officer, member of any fire department, or operator of an emergency vehicle, that emergency circumstances require the clearing of the crossing.

In the event of any uncontrolled blocking not otherwise provided for in this rule, crossing shall be cleared with reasonable dispatch.

San Diego: At Fifth and Eighth Avenues, do not enter intersection until crossing signals have been operating twenty (20) seconds unless protected by a flagman. Do not kick or drop cars over crossing.

On L Street, maximum speed permitted over street crossings is 5 MPH. Engines and cars must be brought to stop before crossing 12th Avenue and movement across street protected by a flagman.

Otay: Movements on spur track across Main Street must be brought to a stop and be protected by a flagman.

Seeley (MP 140.8): Trains moving out of 3-D Cattle Spur, must stop at point of switch until gates are down before proceeding westward over Navy Crossing.

CORONADO BRANCH

National City: Do not enter 13th Street crossing in excess of 5 MPH.

LA MESA BRANCH

Lemon Grove: At Broadway, approach crossing prepared to stop but not exceeding five (5) MPH.

La Mesa: At La Mesa Blvd., Allison and University Aves. Approach these crossings prepared to stop but not exceeding five (5) MPH.

El Cajon: At Main Street; traffic signals are pre-empted by train movements. Before entering crossing, wait not to exceed twenty (20) seconds for display of white light on signal case or mast, which will indicate traffic stopped on those streets. Do NOT leave cars between insulated joints.

El Cajon: At Fletcher Parkway, traffic signals are pre-empted by train movements and will show flashing red signal on Marshall Avenue indicating traffic stopped on Fletcher Parkway.

RULE 104. The normal position of junction switches at Twelfth St., National City and Chula Vista Jct. is for the San Diego-El Centro main track.

RULE 104-D. Running switches will be made only when in the judgment of the conductor it is necessary and with his personal supervision.

RULE 221. Trains must obtain clearance before leaving:

San Ysidro.....Eastward trains

Tijuana, Tecate and Campo are designated as permissive block stations.

Permissive block station cards may be issued at Tijuana, Tecate or Campo by the agent or telegrapher which will authorize movement of extra trains between these stations.

The agent or telegrapher at Tijuana, Tecate or Campo must not issue a permissive block station card to an extra train while another train is occupying that block.

When necessary to issue a permissive block station card, it must be filled out correctly, showing thereon the station, date, train addressed, station between where such movement is authorized, time issued, and then signed by the agent or telegrapher. Before delivery is made to the conductor or engineer of the train, the agent or telegrapher must transmit the contents of the permissive block station card to the next permissive block station by telegraph or telephone. Agent or telegrapher at that station must acknowledge and then arrange to stop and hold all trains from entering the block at that station until the extra train so authorized has cleared the block and the conductor and engineer have delivered their copies of the permissive block station card to the agent or telegrapher at one of the limits of the block.

CERTAIN FIXED SIGNALS

Protective Device Indicator. Semaphore type indicators protect Bridge 102.29 and are located at MP 102.2 and MP 102.3. When indicators display red aspect, train must stop and then proceed with caution to Bridge 102.29 where train will stop and member of train crew must immediately call train dispatcher or any open station and report that indicator displays red aspect. Train will await arrival of maintenance man who will inspect bridge and will authorize train to proceed if safe to do so.

RULE 812. Applies at El Centro.

RULE 825. At terminals where instructions require application of hand brakes on freight trains, outgoing crews must not release hand brakes until road engine is coupled and brake system charged.

Many new cars are equipped with truck mounted brakes (Wabcopac, Nycopac, etc.). The hand brake is effective on these cars on "B" end only. It will be necessary to check "B" end of these cars to determine that hand brake has been released.

Rail skids are hung on posts at locations listed under subdivisions. When using rail skid it must be placed on rail and leading wheel of first car in descending direction run onto rail skid and hand brakes set if brakes are operative before engine is detached. Train crews picking up cars from these locations must remove rail skid, return to proper location and lock in place where lock is provided.

RULE 827. Engines running light on descending grade without dynamic brake in operation must stop a sufficient length of time to permit wheel heat radiation if there is INDICATION OF OVERHEATING.

ROLLER BEARINGS LOOSE OR MISSING CAP SCREWS

During inspection by trainmen, if any roller bearing is found with one cap screw loose or missing and hot box detector has not been activated and check with tempilstik reveals no overheated condition, train may proceed to the next terminal where car must be set out.

Under the same circumstances, when two or more roller bearing cap screws are found loose or missing, train may proceed with caution to the first available track where car must be set out.

CONTINUOUS WELDED RAIL (CWR) TRAINS

Continuous welded rail (CWR) trains consist of a tiedown car and a number of roller-rack cars and may contain other cars, such as threader cars and elevator cars to accompany movement. A steel-end box car, refrigerator car, or high-side gondola car must be positioned on each end of CWR train as a buffer car during all movements except preparatory to and during unloading.

In addition to other requirements of this rule, when a CWR train is stopped for any reason, inspection must immediately be made of as much of train as practicable and the following items checked if train is carrying a full or partial load:

a. Check for undesired movement of rail. The tops of rails are painted adjacent to the tiedown rack on the tiedown car which is located near center of train. Paint marks on each tier of rail must be in line; otherwise, this is an indication of an undesired movement of rail.

b. Check each rail end to make certain it overhangs the last supporting roller by at least 12 feet and is no closer than 12 feet from the next empty roller. Rails are marked 12 feet from each end.

c. When a load contains continuous lengths of rail made up of more than one piece, check to see that rail joints are secured with at least four bolts, properly tightened, and that rail ends have not pulled apart.

d. Check coupler operating levers to make certain they are in position to prevent uncoupling and that coupler operating lever locking devices are in position and locked.

When any of these conditions are not as required, train must not be moved until train dispatcher has been contacted and further instructions are received.

On freight and mixed trains between KP 14 and KP 19 and between Redondo and Coyote Wells, a member of crew must observe track to rear of train for evidence of distressed or derailed car(s), or any other condition requiring immediate stopping of train.

Engines running light on descending grade without dynamic brake in operation must stop a sufficient length of time to permit wheel heat radiation if there is indication of overheating. Stop need not be made if in the judgment of engineer it is safe to proceed.

RULES 827-A and 838. FLAMMABLE COMPRESSED GAS (FCG).

Following are shipping names of Flammable Compressed Gas (FCG):

Standard Transportation Classification Code	Shipping Name
4905705	Butadiene, inhibited (butadiene from alcohol)
4905704	Butadiene, inhibited (butadiene from petroleum)
4905703	Butadiene, inhibited (butadiene, impure, for further refining)
4905706	Butane
4905706	Liquefied petroleum gas (butane)
4905702	Butane (butane, impure, for further refining)
4905702	Liquefied petroleum gas (butane, impure, for further refining)
4905727	Compressed gases, n.o.s. (dispersant gases, nec. flammable)
4905748	Compressed gases, n.o.s. (iso-butene)
4905775	Compressed gases, n.o.s. (refrigerants, nec, liquid, flammable)

Standard Transportation Classification Code	Shipping Name
4905713	Cyclopropane
4905716	Difluorethane
4905719	Difluoromonochloroethane
4905510	Dimethylamine, anhydrous
4905725	Dimethyl ether
4905734	Ethylene
4905749	Hydrocarbon gas, liquefied
4905749	Liquefied hydrocarbon gas
4905746	Hydrogen
4905745	Hydrogen, liquefied
4905410	Hydrogen sulfide
4905747	Isobutane
4905747	Liquefied petroleum gas (isobutane)
4905750	Isobutane (isobutane for further refinery processing)
4905750	Liquefied petroleum gas (isobutane for further refinery processing)
4905752	Liquefied petroleum gas
4905707	Liquefied petroleum gas (butene gas, liquefied)
4905711	Liquefied petroleum gas (butylene, impure for further refining)
4905780	Liquefied petroleum gas (pintsch gas)
4905758	Methylacetylene—propadiene, stabilized
4905761	Methyl chloride
4905764	Methyl chloride—methylene chloride mixture
4905520	Methyl mercaptan
4905530	Monomethylamine, anhydrous
4905781	Propane
4905781	Liquefied petroleum gas (propane)
4905785	Trifluorochloroethylene
4905540	Trimethylamine, anhydrous
4905792	Vinyl chloride
4905795	Vinyl methyl ether, inhibited

When necessary to provide helper engine for trains handling tank cars containing Flammable Compressed Gas (FCG), helper engine must be placed in accordance with helper service instructions and there must be a proper separation of the helper engine from cars containing Flammable Compressed Gas (FCG).

Unless specifically authorized, trains or cuts of cars containing Flammable Compressed Gas (FCG) must not exceed 100 cars or 8,000 tons.

RULE 829. In addition to other train inspection requirements, when a train stops to be met or passed by a continuous welded rail (CWR) train, the CWR train must also be inspected to determine rails are in position in the roller racks, that ends of continuous rails are not closer than 12 feet from the next empty roller and that they overhang the last supporting roller by at least 12 feet, and to see that cars are properly coupled with locking devices in place.

RULE 872. Enginemen when taking charge of engines at San Diego or El Centro will consider engines as having been amply supplied with fuel, sand, water, tools, supplies and flagging equipment in serviceable condition.

RULE 874. When radio communication is used under provisions of this rule the following will govern, for example:

APPROACHING

Head end "SDAE Extra 9200 West { Hot box detector on right (or left). / Wide load detector on right (or left). / Dragging equipment detector on right (or left). / Person inspecting train on right (or left)."

Rear end "SDAE Extra 9200 West. (Repeat)."

AFTER PASSING

Rear end "Highball the....., SDAE Extra 9200 West."*
Head end "Highball the....., SDAE Extra 9200 West."*

*Stop or other appropriate response if detector or person inspecting train so indicates.

RULE 883. Light engines must not be left unattended between Redondo and Coyote Wells, unless protected by derail or inside switch.

RULE 958. First paragraph is revised to read:

Employes shall identify the radio station from which they are calling by prefacing their call with the railroad name, for example: "SDAE Caboose Train Second 802 calling SDAE Engine Second 802, over" and to answer a call, announce, for example: "This is SDAE Engine, Train Second 802, over."

AIR BRAKE RULES

RULE 2. Enginemen when taking charge of engine at San Diego or El Centro will consider that condensation has been drained from reservoirs, and from moisture and dirt collectors; sanders are operating properly and engine wheels have been properly inspected for flat spots.

RULE 3. A full independent brake application on road locomotive classes EP 636, GF 628, GF 630, GF 633, EF 623, EF 630, EF 636, EF 850B results in a brake cylinder pressure of 72 psi. This brake cylinder pressure must be maintained to provide braking power at very low speeds or when stopped. Under no circumstances must self lapping portions of independent brake valve be changed except to obtain brake cylinder pressure of 72 psi from a full independent brake application.

RULE 9. The following series of cars are equipped with ABEL Brake system which has automatic changeover feature to provide proper brake function when car is loaded and when empty:

SSW 75700–75799	Gondolas
SSW 78500–78599	Hoppers (Open Top)
SP 333500–334399	Gondolas
SP 337500–337599	Gondolas
SP 345000–345669	Gondolas
SP 354000–354399	Gondolas
SP 463500–464999	Hoppers (Open Top)
SP 467500–467549	Hoppers (Open Top)
SP 480000–480193	Hoppers (Open Top)
SP 491000–491059	Hoppers (Covered)
SP 492000–492039	Hoppers (Covered)
SP 500604	Flat Car
SP 590000–590099	Flat Cars

The following series of cars are equipped with ABDEL brake system, which has automatic change-over feature to provide proper brake function when car is loaded and when empty. This feature is fully automatic on these series and requires no action on part of engineer:

SP 337600–337699	Gondolas
SP 354750–355299	Gondolas
SP 463337–463486	Hoppers (Open Top)
SP 464000–465699	Hoppers (Open Top)
SP 590100–590131	Flat Cars (Anode)
SP 595500–595624	Cradle Flats

RULE 17. Retaining valves must be used on freight and mixed trains on descending grades

Hipass to Jacumba
MP 106.71 to Coyote Wells

as follows:

Without dynamic brake in operation:

One retaining valve for each 80 tons in train. If gross tonnage exceeds 80 tons per operative brake, retaining valves must be used on all cars and speed must not exceed 15 MPH.

With dynamic brake in operation:

	Permissible Tons Per Unit Without Retaining Valves				
	Basic Dynamic Brake		Extended Range Dynamic Brake		
	4-Axle	6-Axle	4-Axle	6-Axle	8-Axle
With dynamic brake in operation but **Without** pressure maintaining system of braking	600	900	725	1075	1450
With dynamic brake in operation and **With** pressure maintaining system of braking	1500	2250	1800	2700	3600

If permissible tonnage is exceeded, one retaining valve must be used for each 150 tons in excess thereof.

When dynamic brakes are not used on helper engine(s), tonnage of such engine(s) must be added to that of train in determining the number of retaining valves required.

RULE 24-F. Air must be cut in on all cars west of engine when handling cars on Commercial Street east of 16th Street, San Diego.

RULE 25-A. Will apply to westward trains at Hipass and to eastward trains at MP 83.5 and Culvert 106.71, except trains with dynamic brakes in operation and not required to stop for other reasons will make a running test at these locations as follows:

Engineer will make reduction of approximately 7 pounds, wait for slack to adjust itself, then add 3 pounds before releasing. Trainmen will note reduction on caboose gage and, following buildup in pressure when brakes are released, give proceed signal.

Tecate: Trains will make running test one-half mile after leaving station.

RULE 27. First paragraph is revised to read:

Refer to Rule 102 of the Rules and Regulations of the Transportation Department regarding procedures when a train or engine with a cut of cars, in motion, on main track or siding has an emergency application of air brakes.

RULE 33. Hipass to Jacumba, and MP 106.71 to Coyote Wells:

Maximum tonnage per operative brake ..... 80 tons
EXCEPT with dynamic brake and pressure maintaining system of braking in operation with not more than 15 cars for each four axles of dynamic brake; with speed not exceeding 15 MPH and with all retaining valves on loaded cars in high pressure position ..... 100 tons

Should dynamic brake failure occur while handling in excess of 80 tons per operative brake, train may proceed at speed not exceeding 15 MPH if in judgement of conductor and engineer it is safe to do so, and provided retaining valves are used as prescribed by Air Brake Rule 17.

Restrictive grades are as follows:

EASTWARD				WESTWARD			
(Sta.) MP	to	(Sta.) MP	Maximum Speed	(Sta.) MP	to	(Sta.) MP	Maximum Speed
84.5		122.5	20	84.5		K-33.9	25

MISCELLANEOUS

1. HELPER SERVICE:

The following covers engine tractive effort in pounds:

Engine Model	Classification	Starting Tractive Effort
C 415	AS415	62,750
RS 11	AS418-1 to 6	65,000
RS 32	AS420	63,750
C 630	AS600-1	102,000
RSD 15	AS624-1	92,500
C 628	AS628-2	97,750
C 630	AS630-1	101,000
GP 9	EF418-1 to 9; EF418C-1-2; EF418E-1-2-3	64,200
GP 20	EF420-1-2; EF420C-1-2	65,100
GP 30	EF423-1; EF423C-1	66,100
GP 35	EF425-1 to 4; EF425C-1-2-3	66,000
GP 40	EF430C-1	67,560
SD 9	EF618-1 to 5; EF618E-1-2	89,700
SD 39	EF623-1-2	104,150
SD 35	EF625-1	95,540
SD 40	EF630-1-2	102,750
SD 40-2	EF630-3-4	102,100
SD 45	EF636-1 to 6; EF636C-1 to 5	103,470
SD 45-2	EF636-7 to 10-12-15; EF636C-6 to 9	102,600
SD 45X	EF642-1-2	103,240
DD 35	EF850B-1	131,750
GP 40P2	EP430-1	70,200
SDP 45	EP636-1	102,500
SW 1200	ES412	62,250
SW 1500	ES415-1 to 6	65,000
MP 15	ES415-7	65,400
SD 7	EX615-1 to 4	82,500
SD 38	EX620-1	104,000
U 25 B	GF425-1-2-3	67,800
U 28 B	GF428-1	67,890
U 28 C	GF628-1	103,120
U 30 C	GF630-1-2	104,850
U 33 C	GF633-1 to 10	104,710
U 50	GF850	139,250

NOTE: For classification of engines, see Item 3.

A. Rule for entraining one helper engine:

(1) On trains of less than 100 cars, helper engine consisting of not more than two six-axle operating units totaling 179,400 pounds tractive effort nor more than two four-axle operating units totaling 135,600 pounds tractive effort or a combination of one four-axle and one six-axle operating unit totaling 157,600 pounds tractive effort may be placed behind caboose.

(2) On trains of 100 or more cars helper engine consisting of only one unit may be placed behind caboose.

(3) Helper engine that does not qualify under (1) or (2) must be entrained as near as practicable to shove 1/3 and pull 2/3 of tonnage handled by helper engine.

B. Rule for entraining more than one helper engine:

(1) Trains having more than one helper engine must have each engine entrained as near as practicable so that it will shove 1/3 and pull 2/3 of tonnage handled.

(2) Trains powered with two helper engines, one of which qualifies to be placed behind caboose, must entrain the swing helper as near as practicable to shove 1/3 and pull 2/3 of tonnage handled by the swing helper.

(3) On ore trains helper engine not exceeding 10,800 operative horsepower may be used immediately ahead of caboose.

(4) On ore trains swing helper must be placed in train with 40% of tonnage between road engine and swing helper.

C. Air must be cut in on all helper engines and helper engine must not be coupled nor uncoupled while train is in motion.

D. Road engineer and helper engineer must communicate any change affecting the operation of their train when means of communication is available. When speed is being held above 8 MPH on ascending grade, helper engineer must regulate amperage during speed reductions or speed increased to maintain the amperage indicated before speed change; if speed of train drops below 8 MPH or when coming to a stop on ascending grade, helper engineer must regulate amperage during speed reduction to maintain the amperage indicated before speed change, then close throttle just before train stops.

E. When speed of trains powered with 12,000 or more horsepower on the head end and with helper engine drops below 16 MPH, road engineer must reduce throttle to Run 6.

When train speed drops below 16 MPH, head end power being reduced to Run 6 may result in helper power working in short time rating. The short time rating must not be exceeded. If it appears that short time rating will be exceeded, assistance must be requested from train dispatcher. If assistance cannot be obtained, grade must be doubled.

F. Trailing tonnage must not exceed that amount of tonnage listed under column "Maximum Tonnage to be Handled by Road Engine With Helper Entrained" for territory over which helper will be used. Should the amount of tonnage computed exceed the maximum tonnage listed, it may be necessary to isolate road units or add helper power. If practical, isolate units behind the lead unit leaving operating units next to the train. Weight of those units isolated and separated from the train by operating units need not be added to train weight in computing location of helper.

If units have to be isolated next to the train, weight of these units must be added to the train when computing location of the helper.

If units are moved dead in consist, they should be placed next to the train and their weight added to the tonnage of the train.

UNLESS OTHERWISE RESTRICTED MAXIMUM TONNAGE TO BE HANDLED BY ROAD ENGINES WITH HELPERS ENTRAINED:

TERRITORY	
San Diego-El Centro (E)	6,500
El Centro-San Diego (W)	4,200

UNLESS OTHERWISE RESTRICTED MAXIMUM TONNAGE TO BE HANDLED BEHIND HELPER ENGINES:

TERRITORY	
San Diego-El Centro (E)	5,524
El Centro-San Diego (W)	3,570

G. In locating helper engine(s) in train, the following example of calculating tonnage for road engine and helper engine(s) will be used:

EXAMPLE:

Train: 42 loads, 87 empties = 5756 tons.
Four-unit road engine (2-GF630, 1-EF623, 1-EF625).
Three-unit helper engine (2-EF623, 1-EF630).

Total road horsepower	10800
Total helper horsepower	7600
Total horsepower	18400

(1) Divide total horsepower by tonnage = $\frac{18400}{5756} = 3.196$ HP/T

(2) Divide road horsepower by HP/T factor = $\frac{10800}{3.196} = 3379$ tons

Road engine will handle 3379 tons

(3) Divide helper horsepower by HP/T factor = $\frac{7600}{3.196} = 2377$ tons

(4) To determine 1/3 of helper tonnage divide $\frac{2377}{3} = 792$ tons

Helper engine will shove 792 tons.

(5) To determine 2/3 of helper tonnage multiply 792 x 2 = 1584 tons
Helper engine will pull 1584 tons.

(6) Under no circumstances should the tonnage that will trail the helper engine exceed that amount indicated in the chart.

(7) Should tonnage trailing road or helper engine, as computed above, exceed the amount indicated in the chart it will be necessary to:

(a) Reduce tonnage or

(b) Relocate helper in compliance with instructions. (Item D under General) or,

(c) Add additional helper(s) of sufficient horsepower to handle tonnage in excess of amounts indicated in chart. Additional helper(s) may be placed behind caboose if they meet requirements of item A 1., if not they are to be entrained as follows:

EXAMPLE:

Train: 170 loads, 2 empties = 13,980 tons
Three-unit road (1-EF630, 1-EF636, 1-GF633)
Four-unit swing helper (1-EF630, 2-EF636, 1-GF633)
Two-unit rear helper (1-EF618, 1-EF630)

Total road horsepower	9900
Total swing helper horsepower	13500
Total rear helper horsepower	4800
Total horsepower	28200

(1) Divide total horsepower by tonnage = $\frac{28200}{13980} = 2.017$ HP/T

(2) Divide road horsepower by HP/T factor = $\frac{9900}{2.017} = 4908$ tons

Road engine will handle 4908 tons

(3) Divide swing helper horsepower by HP/T factor = $\frac{13500}{2.017} = 6693$ tons

Swing helper will handle 6693 tons (total)

(4) To determine 1/3 of swing helper tonnage divide = $\frac{6693}{3} = 2231$ tons

Swing helper will shove 2231 tons

(5) To determine 2/3 of swing helper tonnage =
2231 x 2 = 4462 tons
Swing helper will pull 4462 tons

(6) Divide rear helper horsepower by HP/T factor = $\frac{4800}{2.017}$ = 2380 tons
Rear helper will handle 2380 tons (total)

(7) To determine 1/3 of rear helper tonnage = $\frac{2380}{3}$ = 793 tons
Rear helper will shove 793 tons.

(8) To determine 2/3 of rear helper tonnage =
793 x 2 = 1586 tons
Rear helper will pull 1586 tons.

GENERAL:

A. At locations designated by the Superintendent, road power must not exceed 24 axles of operative power.

B. Helper engine must not be placed on head end of train without authority being obtained from train dispatcher.

C. AS415, AS420, ES412 and ES415 class, except ES415 class numbers 2680-2759 units must not be cut into train in helper service. ES415 class numbers 2400-2679 may be cut into train and used in helper service providing coupler stops are applied and locked on both ends of the engine. No more than two of these units may be placed behind the caboose.

D. Should it become necessary to relocate the helper at other than the shove 1/3, pull 2/3 location in order to separate helper from restrictive cars or in compliance with maximum tonnage trailing helper limitations, the helper may be relocated, but under no circumstances in relocations may helper shove less than 30% nor more than 45% of the total tonnage to be handled by the helper.

When helper engine is shoving on ascending grade throttle must be reduced as train speed reduces, then throttle regulated so that amperage will be approximately the same as indicated before train speed reduction.

2. PLACEMENT OF RESTRICTED CARS IN TRAIN WITH OR WITHOUT HELPER:

(a) Empty 85-foot-long or longer equipment must be entrained 10 or more cars behind road engine and 10 or more cars ahead of helper engine in territories where grade is 1.8 percent or over and curvature is 10 degrees or more. A flat with one van or one container either loaded or empty will be considered as an empty. These instructions apply between Hipass and Coyote Wells.

(b) When average weight of cars in train, other than locals, or switchers, is more than 60 tons per car, do not handle any cars which weigh less than 50 tons within five cars of road engine.

(c) Certain USAX and DODX flat cars in series 38016 thru 38665 and 39095 thru 39199 are restricted to movement on rear of train and behind any helper engine. Restricted cars will be indicated on Conductor's train list at terminals. When cars listed in above series are picked up at locations other than a terminal, they must be entrained on rear of train and behind any helper unless it is determined that cars are not restricted.

(d) Cars measuring less than 35 feet over coupler pulling faces must not be handled in train coupled to cars longer than 60 feet over coupler pulling faces.

At locations where a Train Mass profile (graph) is furnished train crews, it will identify a car measuring less than 35 feet over coupler pulling faces with the letter "S," and cars measuring over 60 feet between coupler pulling faces will be identified by the letter "L."

Because the majority of cars measuring under 35 feet are tank cars, car code "TS" will identify these cars on train list and/or switch list.

3. CLASSIFICATIONS ARE DESCRIPTIVE OF ENGINES AS FOLLOWS:

E F 4 15 A C 01

- 01 — Denotes Order of Purchase for Units of same Classification.
- C — Denotes Ownership if other than SPT Co.: C = SSW Ownership. E = SP Equipment Co. owned, leased to SPT Co. S = SP Equipment Co. owned, leased to SSW Ry.
- A — Denotes Car Body Type with Control Cab; B = Booster; No Letter = Road Switcher Type.
- 15 — Denotes Horsepower in Hundreds: 00 = Not Powered; 18 = 1750–1800 HP, etc.
- 4 — Denotes Number of Axles.
- F — Denotes Service Assignment: F = Freight; M = Misc.; P = Passenger; S = Switcher.
- E — Denotes Builder: A = Alco; E = EMD; G = GE; S = SPT.

4. SPEED RESTRICTIONS FOR ENGINES: Maximum speed shown below is subject to further restriction applicable to certain territories as shown in Speed Restrictions for Trains:

MAXIMUM SPEED AND LENGTH OF ENGINES

CLASSIFICATION	ENGINE NUMBERS	MAXIMUM SPEED EXCEPT#	LENGTH (FEET)
ES406	1004	45	44
ES408	1100-1128	65	44
ES408B	1150-1153	65	44
ES409	1190-1199	65	44
AS409	1200-1281	60	45
ES410	1300-1337	65	44
AS410	1820, 1842	60	45
ES412	2250-2316	65	44
AS415	2400-2409	65	54
ES415	2450-2689	65	45
ES415	2690-2759	65	48
AS418	2900-2903; 2905-2936	70	57
EP418	3001-3002; 3004-3010	70	56
EP418	3186-3196	70	56
EP430	3197-3199	70	63
EF418	3300-3822	70	56
AS420	4000-4009	70	57
EF420	4030-4153	70	56
EF423	5000-5017	70	56
GS407	5100-5109	55	37
EF425	6500-6681	70	56
GF425	6700-6767; 6800-6865	70	60
GF428	7025-7028	70	60
EF430	7600-7607	70	59

Engines handled dead must not exceed speed shown in table.

#When operated in multiple unit control, on head end of train or running light and engineer is in other than the leading control cab in direction of movement, speed must not exceed 30 MPH.

ANY LOCOMOTIVE NOT LISTED.....35 MPH*

*Except when other speed is authorized by train order.

5. OTHER INSTRUCTIONS:

A. MOVEMENT OF LOCOMOTIVES

1. Engines equipped with multiple unit controls (MU) and alignment control couplers, weighing 150,000 pounds or more, may be handled on head end of train; if weighing less than 150,000 pounds, must be placed near rear of train in accordance with Item 5.

2. ES415 class units, 2680-2759, are equipped with alignment control couplers and may be MU'd in engine consist without regard to location. These engines also may be moved dead on head end of train first behind working units.

3. ES415 class units, 2450-2679, are equipped with hinged coupler stops. With coupler stops in place, these engines may be MU'd in engine consist without regard to location, or may be moved dead on head end of train first behind working units.

For use in road service, MU service, or dead in train, the coupler stops must be closed (swung in) into coupler opening against coupler pocket side with locking pin secured behind coupler carrier on both ends of engine.

For use in switching service the coupler stops must be opened (swung back) against end of engine and locking pin secured in bracket provided.

Locking pins must be in place (whether coupler stop is swung back or swung in) to insure securement of the coupler stop.

4. Many switcher-type engines are not equipped with alignment control couplers or hinged coupler stops. Included are engine classes AS415, AS420, and certain ES412 units (2266, 2271, 2272, 2275, 2276, 2279, 2282-2288 inclusive). These engines are equipped with dynamic brake wire and must, if practicable, be MU'd in accordance with the following rules:

(a) One switcher unit may be MU'd on head end of a road consist, provided no other engine consist or cars coupled ahead of such road consist and provided the train is operating in territory where dynamic braking is not required.

(b) One switcher unit may be MU'd on the rear end of a single unit road engine handling a train provided the train is operating in territory where dynamic braking is not required and no reverse movements are to be made with cars.

(c) When operating with a mixed consist of road and switcher units in territory where dynamic braking is required, not more than two switcher units of the types listed in Item 4 will be used, subject to the following additional restrictions:

(1) If one unit is used, it will be placed as the second unit in engine consist.

(2) If two units are used, they will be placed as second and third units in engine consist.

(3) A road-type unit must be coupled against the train.

(4) If necessary to make a reverse move with cars or train, lead unit must be isolated.

(d) If it is necessary to operate a mixed consist of road and switcher units with more than two switcher units of the types listed in Item 4, all switcher units must be placed in the lead. If reverse movement is made with cars or train, all units ahead of the two rear switcher units must be isolated.

(e) If engine consist is made up entirely of switcher units listed in Item 4, not more than two units may be on the line when making a reverse movement with cars or train and those units on line must be located closest to the train.

5. When necessary to handle IN A TRAIN (not MU'd with locomotive consist) engines in classes ES406, ES408, ES408B, ES409E, AS409, ES410E, AS410, ES412 (except units listed in Item 4), GS407, ES412E, AS415, AS420, must be prepared for dead movement as required by Item 6 and placed in train as follows:

(a) On head end first behind engine handling train, provided train does not exceed 800 tons.

(b) On trains of more than 800 tons, these units must be moved not less than 5 nor more than 10 cars ahead of rear of train and behind any helper engine.

(c) Not more than two of these engines may be moved in a train and when two are moved they must be separated by a car not longer than 50 feet.

(d) Foreign line engines not equipped with alignment control couplers are to be considered the same as engine classes listed in Item 5.

6. PREPARATION OF AIR EQUIPMENT FOR MOVEMENT DEAD IN TRAIN.

ALL UNITS: Reduce main reservoir pressure to 25 lbs. above zero.

Cut in dead engine feature.

Remove automatic brake valve handle in running position or with 26-L equipment, remove in handle off position.

If brake valve handles cannot be removed, they must be blocked in running position.

IN ADDITION:

24 RL equipment:

Close brake pipe cut out cock and place the dual ported cut out cock in cut-in position.

Open the end cocks on actuating pipe and independent application and release pipe.

6 SL or 14 EL equipment:

Close the brake pipe cut out cock, or place the rotair valve or 3 position brake pipe cut out cock in dead position.

26 L equipment:

Place the brake pipe cut off valve in cut-out position.

Place the dual ported cut out cock in open or cut in position, or place the MU 2a valve in lead or dead position.

Open the end cocks on actuating pipe and brake cylinder equalizing pipe.

7. Extreme caution must be used during dynamic braking or when making reverse move to prevent jackknifing and track damage.

B. Dead or disabled engines, and equipment listed in timetable which requires movement at reduced speed must first be reported as ready to move to the Chief Train Dispatcher, who will designate the train in which the engine or equipment is to be moved. Any such engine must not be handled in train until train order designating maximum speed is issued.

C. Engines operated with engineer in other than lead unit in direction of movement, must not exceed 20 MPH when approaching highway or street crossing at grade, subject to further restrictions imposed by local conditions.

D. Movement of foreign line engines, in service or dead in train, must not be authorized until provisions of current Line Clearance Circular have been complied with.

E. When unit or units in locomotive consist emit excessive smoke through exhaust stacks other than from cold start, prompt report must be made to train dispatcher who will arrange to notify roundhouse foreman or locomotive maintenance forces on duty at first maintenance facility where train is scheduled to stop. Unit number, time and location where excessive smoking of unit was first observed must be reported.

When a yard engine is observed emitting excessive smoke, report must be made to roundhouse foreman or locomotive maintenance forces on duty.

In addition, engineer must make appropriate entry on work report, Form CS 2326.

F. Not more than five diesel units in operation may be used on head end of any freight train without the permission of the Superintendent.

G. Engine units of more than four axles will not be permitted to operate unless authorized by the Superintendent.

H. Unless otherwise authorized, trains handling passenger cars with flat spots on wheels in excess of 3¼ inches in length must not exceed 10 MPH. When flat spots are not in excess of 3¼ inches long such cars may be operated at maximum authorized speeds.

I. Gross weight of SPMW 6400-6439 100-ton air dump cars cannot exceed the gross weight shown in Special Instructions or Line Clearance Circular for each branch line. Also, cars must not be dumped on curves of 25 degrees or more, or operated through curves of 35 degrees or more.

J. Forward brakeman on freight trains will ride the lead unit when a seat is available.

K. Open-top cars with lading height exceeding fifteen (15) feet six (6) inches, except cars transporting highway trucks or trailers, multi-level freight cars either loaded or unloaded, and automobile underframe cars, shall be entrained at least five (5) cars distance from engine or caboose if length of train permits on trains operating in or through the States of California and Nevada.

Freight cars of a height greater than fifteen (15) feet six (6) inches shall be entrained at least five (5) cars distance from caboose if train length permits.

L. Except when handling cabooses on or near the head end in local or road switcher service and when handling only a few cars, cabooses are not to be moved other than at rear of train.

M.

MAXIMUM SPEED PERMITTED WITH CERTAIN EQUIPMENT	MPH MAIN TRACKS OTHER THAN BRANCHES	MPH MAIN TRACKS ON BRANCHES
Double or triple loads		25
Scale test cars	40**	30
Except: SPMW 2024, 2025, WO-3	65	49
K&J, pedestal or center-hinged air-dump cars (except SPM-W 5100 to 5289 loaded or empty)	35*	25*
Locomotive cranes:		
Locomotive Crane/Pile Drivers		
SPMW 6603 & 6604:		
With boom in place, either end forward①	25*	15*
With boom disconnected, heavy end forward	45	25
boom end forward	20*	15*
With boom disconnected and removable counterweight properly positioned, either end forward	55	25
SPMW 4028, 4029, SSW 96405:		
With boom in place, either end forward①	25*	15*
With boom disconnected, heavy end forward	40	25
boom end forward	20*	15*
With boom disconnected and removable counterweight properly positioned, either end forward	40	25
SPMW 4027 SPMW 5870		
4088 5874		
4091 5899		
5437 6601		
5479 6602		
5595 SSW 96404		
5852 NWPMW 31		
With boom in place, either end forward①	25*	15*
With boom disconnected, heavy end forward	45	25
boom end forward	20*	15*
Steam pile driver SPMW 4053	35	25*
Jordan Spreaders:		
Running backward	25	20
Moving forward (prepared for travel)	35	35

*These speeds must not be exceeded, and on curves where authorized speed is more than 15 MPH speed must be reduced to 5 MPH less than shown in timetable and on speed signs.

**Scale Test Car NBS-1 to be handled on trains not more than 20 cars ahead of caboose and speed of train handling NBS-1 not to exceed 60 MPH.

① When moving in train with boom in place, operator must be on board.

Unless specifically authorized, SPMW 4027, 4028, 4029, 4088, 5479, 5595, 5852, 5870, 5874, 5899, 6601, 6602, 6603, 6604, SSW 96404 and SSW 96405 must not operate over lines having maximum load limits of less than 263,000 lbs. and must observe all restrictions applying to cars weighing over 210,000 lbs.

N. Load limit (car and contents). . . . . 263,000 pounds
*El Centro-Seeley . . . . . 281,000 pounds

Coronado Branch:

24 St. to MP 7 . . . . . 199,000 pounds
Salt Works to MP 12 . . . . . 199,000 pounds

*Gross weight of 281,000 pounds applies to uniformly loaded four-axle cars with minimum axle spacing of 5 ft. 10 in. and minimum distance 37 ft. 0 in. between truck centers; also with wheels more than 38 in. diameter.

Unless authorized by Superintendent, heavier loads must not be handled.

O. INTERNATIONAL BOUNDARY

Trains approaching gate at International Boundary, San Ysidro, will sound one long blast of whistle to inform Government Officials of their presence. If prompt response is not gained after whistle blast, an employe will go at once to Government Headquarters and request service.

Trains will stop before crossing International Boundary line at San Ysidro. Trains in both directions when not accompanied by Customs Immigration Rider will stop at Campo. Trains in both directions will stop at Tecate. Trains must not cross International Boundary line without first notifying Customs and Immigration Officers and obtaining necessary permission from them.

Westward trains coming into Tijuana, when not accompanied by rider, will proceed without stopping to Boundary line for inspection by Officers of the Mexican Government, after which cars for Tijuana may be set out and necessary switching performed.

To permit Immigration and Customs inspection of trains while entering the United States, eastward trains departing Campo, and westward trains departing San Ysidro, must not exceed 5 MPH until rear of train passes station and proceed signal is given from caboose. Conductor will watch for signal from station force in case necessary to bring train to a stop.

Westward trains will stop with caboose clearing crossing west of international gate San Ysidro and will proceed only after released by Border Patrol officer in charge of inspection or in the event no Border Patrol inspection is made, by Telegraph operator on duty. This release will be given to Conductor only.

P. Plaster City: Scale track must not be used between east switch and derail or sign west of scale. Switch and derail secured with U.S.G.Co. lock.

Do not enter U.S.G.Co. Track 4 when gypsum chute is in loading position.

Q. INSTRUCTIONS IN CASE OF FIRE

1. FIRE FIGHTING EQUIPMENT:

(a) Five-gallon fire extinguishers are located at following points:

East end Tunnel 4	West end Tunnel 14
West end Tunnel 5	West end Tunnel 15
West end Bridge 97.68	West end Tunnel 16
East end Tunnel 6	East end Tunnel 17
Both ends Tunnel 8	West end Tunnel 18
West end Tunnel 9	West end Bridge 104.01
West end Tunnel 10	West end Bridge 104.37
West end Tunnel 11	West end Tunnel 19
West end Tunnel 12	West end Tunnel 20
East end Tunnel 13	West end Tunnel 21

Note: Fire extinguishers at tunnels are located just inside tunnel portals.

(b) Tank Car MW-1001 with 10,000 gallons of water is kept first out at Tunnel 15 spur. A pump is mounted on deck over top of tank which can be operated by air from train line; 300 feet of fire hose on a reel; and a tool box containing fire-fighting tools and fittings. Car is equipped with headlights on each end, and extension cord is kept in tool box. Cord may be plugged into outlets on engine or into any light socket by replacing bulb with screw socket. Air line to pump is fitted with hose connection at each end of car, so that pump can be operated from either end of engine or train. A length of hose and fittings are kept in tool box to make connections. When pump is being run from train line, automatic brake valve on engine should be held in Full Release position, and engine speed increased to increase volume of air.

2. INSTRUCTIONS:

(a) **Trains discovering a fire should immediately call operator so equipment can be dispatched to fire.** If engine is equipped with fire-fighting facilities, every effort should be made to extinguish the fire with the equipment on the engine. If it is evident that fire cannot be put out with equipment at hand and it is possible to reach tank car at Tunnel 15 spur, get that car and return to the fire. Tank car should be picked up so that it will be headed into the fire ahead of engine or train. Stake and pinch bar are included with tools on deck of tank car. Tunnels and bridges in some places are located so close together that a fire may spread to another structure. While it might not be possible to extinguish the fire in one structure, equipment should stand by to prevent fire from spreading.

Employes will use their best judgment in meeting an emergency and act in the safest and quickest way to meet the conditions.

(b) **Tank Car MW-1001 must always be left, filled and first out at Tunnel 15 spur.**

Instructions for starting and shutting down compressor engine posted inside of car.

R. REPEATER AIR CAR (RAC) SP-260-266

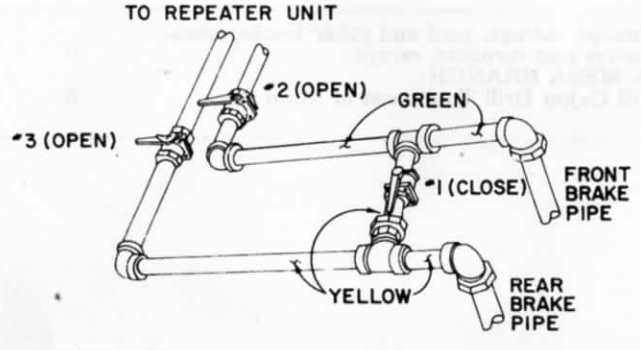
The repeater air car is utilized to increase efficiency of train air brakes on long trains and during cold weather. The purpose of repeater relay equipment is to accept pneumatic signals from the brake pipe of forward portion of a train, and by relay action, produce a corresponding response in the brake pipe of the rear section of the train.

The repeater relay car has the ability to produce faster train charging time, reduce or eliminate brake pipe pressure gradient, more uniform braking forces, and faster brake application and release times.

A. Procedure for adding Repeater Air Car to a train to use Repeater Car Air Equipment.

1. Place as near to center of train as makeup will permit.
2. The RAC car is operational in either direction. The front brake pipe must be coupled to the portion of the train to which the road engine is attached. The rear brake pipe must be coupled to the other end of the train.

   The angle cock on the unused brake pipe on each end of the car must be closed.
3. Where repeater air car is positioned in train and front and rear brake pipes have been properly connected and opened, then close the brake pipe bypass cock No. 1 and open the two repeater relay cutout cocks Nos. 2 and 3, **all located inside of car.**

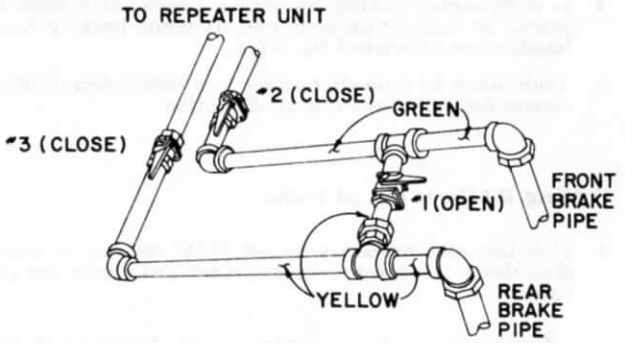


Note: If for any reason it becomes necessary to transfer control of air brakes to the helper engine located in the portion of the train **behind** the RAC car with the RAC air equipment in operation, the brake pipe hose connections must be changed. The forward brake pipe must be coupled to the portion of the train having the brake valve which is controlling the train. The rear brake pipe must be coupled to the other end of the train.

4. The repeater relay valve No. 5 is a variable valve and is employed to reestablish a satisfactory brake pipe pressure on the rear portion of train. A regulator and gage to indicate pounds of differential is provided. Trainline pressure on rear portion of train must not be increased above 90 PSI at RAC car. Preferred adjustment is to have the rear brake pipe 1.5 to 2 lbs. above the front brake pipe.

B. Procedure for cutting the RAC car out of train.

1. Close the repeater relay cutout cocks Nos. 2 and 3.
2. Open the brake pipe bypass cock No. 1—**All located inside the car.**
3. The car diesel engine and compressor are to remain running except during layover time.



C. Procedure for adding Repeater Air Car to a train when Repeater Car Air Equipment is not to be used.

1. Close the repeater relay cutout cocks Nos. 2 and 3.
2. Open the brake pipe bypass cock No. 1—**All located inside the car.**
3. Forward brake pipe must be coupled to portion of the train to which the road engine is attached.

   Rear brake pipe must be coupled to the other end of the train. The angle cock on the unused brake pipe on each end of the car must be closed.

D. Train operation of Repeater Air Cars.

1. With the repeater air car in operation, proceed with terminal air test as prescribed in the air brake rules and regulations.
2. All rules outlined in the air brake rules and regulations governing train handling shall be adhered to while repeater air car is part of any train.
3. If required, the repeater air car may be cut out by closing the repeater relay cutout cocks Nos. 2 and 3 and opening the brake pipe bypass cock No. 1—**All located inside car.** This provides for normal train operation without the repeater relay equipment operating.
4. If yard air is used to charge the train, it **must** be cut in ahead of the repeater air car.
5. The RAC car must not be kicked, dropped, or humped and must be handled next to switch engine when being cut into or out of train and when being moved to caboose track.

6. During a pickup or setout, or at any time the engine is **separated from the train and the air car is in operation in the train, it is absolutely essential that the trainline angle cock be left open on the train.**

E. Loss of Main Reservoir Air on RAC car.

1. The depletion of main reservoir air to below 100 lbs. will initiate a service brake pipe reduction in the forward and rear portions of the train. The rotating red light on top of car will operate.
2. In addition to the red rotating light, a radio signal will be initiated and will transmit a series of short beeps for a period of approximately ten seconds and then cease. It will reset itself automatically upon an increase of main reservoir pressure above 110 pounds.
3. If in power, throttle must be reduced to idle and automatic brake valve placed in full service zone until train stops.
4. If in dynamic braking, automatic brake valve must be placed in full service zone and dynamic braking lever handled as prescribed by rules.
5. Train must be immediately secured before determining reason for main reservoir air depletion.

F. Setting RAC car out of train.

1. If it becomes necessary to set RAC car out of train, shut down compressor engine in car and secure car per rules.

Instructions for starting and shutting down compressor engine posted inside of car.

SPEED RESTRICTIONS FOR TRAINS: Maximum speed of trains in territory shown below is subject to further restrictions applicable to engines in the train as shown in SPEED RESTRICTIONS FOR ENGINES, MAXIMUM SPEED PERMITTED WITH CERTAIN EQUIPMENT, and OTHER MAXIMUM SPEEDS appearing on pages 8 and 10 of Special Instructions. Speed must be further reduced as prescribed by speed signs, except as specifically authorized by Special Instructions herein, or by timetable bulletin.

EASTWARD	ALL TRAINS
MP MP	
SAN DIEGO TO EL CENTRO:	
1.10 to 3.00	10
3.00 to 5.00	20
5.00 to 14.00	30
14.00 to 14.42	20
14.42 to 15.57 (KP 0.00)	30
KP KP	
0.00 to 10.00	20
10.00 to 16.00	30
16.00 to 17.97	20
17.97 to 33.90	35
33.90 to 40.69	30
40.69 to 41.70	20
41.70 to 66.59	30
66.59 to 67.64	25
67.64 to 71.41 (MP 59.94)	30

WESTWARD	ALL TRAINS
MP MP	
EL CENTRO TO SAN DIEGO:	
147.84 to 147.53 (wye switch)	10
147.53 to 122.50	30
122.50 to 106.56	25
106.56 to 99.10	20
99.10 to 98.67	10
98.67 to 96.61	20
96.61 to 92.90	30
92.90 to 84.50	25
84.50 to 82.07	30
82.07 to 81.79	25
81.79 to 76.77	30
76.77 to 76.09	25
76.09 to 73.95	30
73.95 to 73.75	25
73.75 to 70.75	30
70.75 to 70.41	25

SPEED RESTRICTIONS FOR TRAINS—Continued

EASTWARD	ALL TRAINS
MP MP	
59.94 to 60.36	30
60.36 to 65.58	25
65.58 to 70.41	30
70.41 to 70.75	25
70.75 to 73.75	30
73.75 to 73.95	25
73.95 to 76.09	30
76.09 to 76.77	25
76.77 to 81.79	30
81.79 to 82.07	25
82.07 to 84.50	30
84.50 to 92.90	25
92.90 to 96.61	30
96.61 to 98.67	20
98.67 to 99.10	10
99.10 to 106.56	20
106.56 to 122.50	25
122.50 to 147.53 (Wye switch)	30
147.53 to 147.84 (Junction switch)	10
TWELFTH ST. NATIONAL CITY TO MP 12.00, except	12
4.77 to 6.02	10
SAN DIEGO TO EL CAJON:	
1.10 to 3.60 (Francis St.), except	10
over 13th, 14th, 28th & 32nd Sts.	5
3.60 to 10.20 (Broadway)	25
10.20 to 13.00	10
13.00 to 16.80	20

WESTWARD	ALL TRAINS
MP MP	
70.41 to 65.58	30
65.58 to 60.36	25
60.36 to 59.94 (KP 71.41)	30
KP KP	
71.41 to 67.64	30
67.64 to 66.59	25
66.59 to 41.70	30
41.70 to 40.69	20
40.69 to 33.90	30
33.90 to 17.97	35
17.97 to 16.00	20
16.00 to 10.00	30
10.00 to 0.00 (MP 15.57)	20
MP MP	
15.57 to 14.42	30
14.42 to 14.00	20
14.00 to 5.00	30
5.00 to 3.00	20
3.00 to 1.10	10
MP 12.00 TO TWELFTH ST. NATIONAL CITY, except	12
6.02 to 4.77	10
EL CAJON TO SAN DIEGO:	
16.80 to 13.00	20
13.00 to 10.20 (Broadway)	10
10.20 to 3.60 (Franics St.)	20
3.69 to 1.10 except	10
over 32nd, 30th, 28th, 14th & 13th Sts.	5

Trains handling tank cars containing Flammable Compressed Gas (FCG) must not exceed 55 MPH. Where maximum authorized speed is less than 55 MPH and more than 25 MPH, train must be operated at 5 MPH less than maximum authorized speed.

SPEED RESTRICTIONS FOR OTHER THAN MAIN TRACK	With Caution Not Exceeding MPH
Through sidings, yard and other tracks, crossovers and turnouts, except	10
LA MESA BRANCH:	
El Cajon Drill Track east of Main Street	6

RULE 10-I

Oral authorization and acknowledgments between Foremen and Engineers for trains to pass "Red Conditional Stop" signs must be worded in the following forms:

"SDAE FOREMAN . . . . AT MP . . . . CALLING SDAE (Train No.) . . . ."

(After train answers giving his identification): (i.e.) SDAE Train . . . .

Foreman's Response

"THIS IS SDAE FOREMAN . . . IN CHARGE OF THE WORK BETWEEN MP . . . AND MP . . . SDAE TRAIN ORDER NO. . . . . WE ARE IN THE CLEAR AND YOU MAY PROCEED PAST THE RED CONDITIONAL STOP SIGN AND THROUGH THE LIMITS OF ORDER AT . . . . MPH, REPEAT . . . . MPH"*

Engineer's Response

"THIS IS ENGINEER SDAE TRAIN . . . . I MAY PROCEED PAST THE RED CONDITIONAL STOP SIGN AND THROUGH THE LIMITS OF ORDER NO. . . . BETWEEN MP . . . AND MP . . . AT (Speed). REPEAT (Speed) MILES PER HOUR."

Foreman must acknowledge Engineer's response as follows:

"SDAE TRAIN ORDER NO. . . . . , BETWEEN MP . . . . AND MP . . . . MPH* OK."

*When no speed restriction account above Form "Y" Train Order, tell train engineer "At Maximum Authorized Speed."

Oral authorization and acknowledgments between Foremen and Engineers for trains to pass "Red Conditional Stop" signs in multiple main track territory must be worded in following forms:

Foreman's Response

"THIS IS SDAE FOREMAN . . . . IN CHARGE OF THE WORK BETWEEN MP . . . . AND MP . . . . SDAE TRAIN ORDER NO. . . . WE ARE IN THE CLEAR OF TRACK . . . AND YOU MAY PROCEED PAST THE RED CONDITIONAL STOP SIGN ON TRACK . . . AND THROUGH THE LIMITS OF ORDER AT . . . . MPH, REPEAT . . . . MPH."

Engineer's Response

"THIS IS ENGINEER SDAE TRAIN . . . . I MAY PROCEED PAST THE RED CONDITIONAL STOP SIGN AND THROUGH THE LIMITS OF ORDER NO. . . . . ON TRACK . . . . BETWEEN MP . . . . AND MP . . . . AT (Speed). REPEAT (Speed) MILES PER HOUR."

Foreman must acknowledge Engineer's response as follows:

"SDAE TRAIN ORDER NO. . . . . ON TRACK . . . . , BETWEEN MP . . . . AND MP . . . . MPH OK."